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Queensborough Trail, July 21, 2022

**END OF SECTION**

Approved: 2009-12-31

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1      Section 32 14 13      Precast Concrete Unit Paving
- .2      Section 32 15 40      Crushed Stone Surfacing
- .3      Section 32 33 00      Site Furnishings
- .4      Section 32 91 19.13    Topsoil Placement and Fine Grading

**1.2                REFERENCE STANDARDS**

- .1      Not used

**1.3                ADMINISTRATIVE**

- .1      Submit to Owners' Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2      Do not proceed with Work affected by submittal until review is complete.
- .3      Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4      Where items or information is not produced in SI Metric units converted values are acceptable.
- .5      Review submittals prior to submission Owners' Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6      Notify Owners' Representative , in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7      Verify field measurements and affected adjacent Work are co-ordinated.
- .8      Contractor's responsibility for errors and omissions in submission is not relieved by Owners' Representative review of submittals.
- .9      Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Owners' Representative review.
- .10     Keep one reviewed copy of each submission on site.

**1.4                SHOP DRAWINGS AND PRODUCT DATA**

- .1      The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

- .2 Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 48 hours review of each submission by Owners' Representative and owner.
- .5 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Owners' Representative prior to proceeding with Work.
- .6 Make changes in shop drawings Consultant may require, consistent with Contract Documents. When resubmitting, notify Owners' Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Wiring diagrams.

- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.
- .9 After Owners' Representative and Consultants review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Owners' Representative may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Owners' Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Owners' Representative.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within contract period for project.
- .13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Owners' Representative.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Owners' Representative.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Owners' Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Owners' Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Owners' Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Public Works and Government Services Canada (PSPC) is for sole purpose of ascertaining conformance with general concept.

- .1 This review shall not mean that PSPC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

## **1.5 SAMPLES**

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Owners' Representative.
- .3 Notify Owners' Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Owners' Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Owners' Representative prior to proceeding with Work.
- .6 Make changes in samples which Owners' Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

## **1.6 MOCK-UPS**

- .1 Erect mock-ups in accordance with related specification Sections.

## **1.7 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of digital photography monthly with progress statement as directed by Owners' Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Frequency of photographic documentation: monthly or as directed Owners' Representative.

## **1.8 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

**Part 2            Products**

**2.1                NOT USED**

.1                Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**1.2 REFERENCE STANDARDS**

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
  - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.
- .3 Public Works Government Services Canada (PSPC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.
- .4 British Columbia Construction Association (BCCA).
- .5 City of New Westminster Design Requirements and Technical Standards document.
- .6 City of New Westminster Servicing standards Manual and Construction Standards.

**1.3 INSTALLATION AND REMOVAL**

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

**1.4 HOARDING**

- .1 Erect temporary site enclosures using material in accordance with BCCA .
- .2 Apply panels vertically flush and butt jointed.
- .3 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.5 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around deep excavations.



- .2 Provide as required by BCCA and BC Building Code.

## **1.6 WEATHER ENCLOSURES**

- .1 Design enclosures to withstand wind pressure and snow loading.

## **1.7 ACCESS TO SITE**

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

## **1.8 PUBLIC TRAFFIC FLOW**

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

## **1.9 FIRE ROUTES**

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

## **1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

## **1.11 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

## **Part 2 Products**

- 2.1 As Per British Columbia Construction Association (BCCA) and City of New Westminster requirements**

## **Part 3 Execution**

- 3.1 As Per British Columbia Construction Association (BCCA) and City of New Westminster requirements**

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 01 74 21 Construction/Demolition Waste Management and Disposal
- .2        Section 31 11 00 Clearing and Grubbing
- .3        Section 31 14 13 Soil Stripping
- .4        Section 31 23 33.01 Excavating, Trenching, and Backfilling
- .5        Section 32 14 13 Precast Concrete Unit Paving
- .6        Section 32 33 00 Site Furnishings

**1.2                REFERENCE STANDARDS**

- .1        Canadian Construction Documents Committee (CCDC)

**1.3                PROJECT CLEANLINESS**

- .1        Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2        Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4        Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5        Dispose of waste materials and debris at approved facility.
- .6        Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .7        Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8        Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .9        Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.4                FINAL CLEANING**

- .1        When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2        Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3        Prior to final review remove surplus products, tools, construction machinery and equipment.

- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Owner or Owners' Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Remove stains, spots, marks and dirt from all work.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .10 Remove dirt and other disfiguration from finish surfaces.
- .11 Sweep and clean paved areas.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                WASTE MANAGEMENT GOALS**

- .1        Prior to start of Work conduct meeting Owner or Owners' Representative to review and discuss PSPC's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
- .2        Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .3        Protect environment and prevent environmental pollution damage.

**1.2                RELATED REQUIREMENTS**

- .1        Section 31 11 00 Clearing and Grubbing
- .2        Section 31 14 13 Soil Stripping
- .3        Section 31 23 33.01 Excavating, Trenching, and Backfilling
- .4        Section 32 93 10 Trees, Shrubs and Groundcover Planting

**1.3                DEFINITIONS**

- .1        Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Owner or Owners' Representative.
- .2        Class III: non-hazardous waste - construction renovation and demolition waste.
- .3        Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
- .4        Inert Fill: inert waste - exclusively asphalt and concrete.
- .5        Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
- .6        Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7        Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8        Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9        Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:

- .1 .
- .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.

#### **1.4 DOCUMENTS**

- .1 Post and maintain in visible and accessible area at job site, one copy of following documents:
  - .1 Waste Source Separation Program.

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to [project start-up]:
  - .1 1 electronic copy of Waste Source Separation Program (WSSP).
- .3 Prepare and submit on monthly basis, throughout project or at intervals agreed to by Owners' Representative the following:
  - .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
  - .2 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.
- .4 Submit prior to final payment the following:
  - .1 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

#### **1.6 WASTE SOURCE SEPARATION PROGRAM (WSSP)**

- .1 As part of Waste Reduction Workplan, prepare WSSP prior to project start-up.
- .2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.
- .3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .5 Locate containers to facilitate deposit of materials without hindering daily operations.
- .6 Provide training for workers in handling and separation of materials for reuse and/or recycling.
- .7 Locate separated material in areas which minimizes material damage.

- .8 Clearly and securely label containers to identify types/conditions of materials accepted and assist workers in separating materials accordingly.
- .9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.
- .10 On-site sale of salvaged materials is not permitted unless authorized in writing by Owner or Owners' Representative and provided that site safety regulations and security requirements are adhered to.

**1.7 USE OF SITE AND FACILITIES**

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Owner or Owners' Representative.

**1.8 WASTE PROCESSING SITES**

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

**1.9 QUALITY ASSURANCE**

- .1 After award of Contract, a mandatory site examination will be held for this Project for Contractor responsible for construction, renovation demolition/deconstruction waste management.
  - .1 Date, time and location will be arranged by Owner or Owners' Representative.

**1.10 STORAGE, HANDLING AND PROTECTION**

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner or Owners' Representative.
- .2 Unless specified otherwise, materials for removal do not become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .8 Separate and store materials produced during project in designated areas.
- .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.

- .1 On-site source separation is recommended.
- .2 Remove co-mingled materials to off site processing facility for separation.
- .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
- .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

#### **1.11 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.
  - .2 Waste type of each bin.
  - .3 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

#### **1.12 SCHEDULING**

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

### **Part 2 Products**

#### **2.1 NOT USED**

- .1 Not Used.

### **Part 3 Execution**

#### **3.1 APPLICATION**

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

#### **3.2 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

- .3 Waste Management: separate waste materials for recycling or reuse 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 Source separate materials to be reused/recycled into specified sort areas.

### **3.3 DIVERSION OF MATERIALS**

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Owner or Owners' Representative, and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.
  - .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged, recyclable, or reusable material is not permitted.

### **3.4 WASTE DIVERSION REPORT**

- .1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of as well as the following:
  - .1 Identify final diversion results and measure success against goals from Waste Reduction Workplan.
  - .2 Compare final quantities/percentages diverted with initial projections in Waste Audit and Waste Reduction Workplan and explain variances.
    - .1 Supporting documentation.
    - .2 Waybills and tracking forms.
    - .3 Description of issues, resolutions and lessons learned.

### **3.5 SCHEDULES**

- .1 Not Used

**END OF SECTION**



**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 31 23 33.01 Excavating and Backfilling
- .2        Section 32 11 16.01 Granular Sub-base
- .3        Section 32 15 40 Crushed Stone Surfacing

**1.2                REFERENCE STANDARDS**

- .1        ASTM International
  - .1        ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2        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.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .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 aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.
- .3        Samples:
  - .1        Provide Owner or Owners' Representative with access to source and processed material for sampling.
  - .2        Supply new or clean sample bags or containers according appropriate to aggregate materials.
  - .3        Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1        Deliver, store and handle materials in accordance with with manufacturer's written instructions.
- .2        Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3        Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
  - .1 Greatest dimension to exceed 5 times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
  - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
  - .2 Reclaimed asphalt pavement.
  - .3 Reclaimed concrete material.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
  - .1 Crushed rock.
  - .2 Gravel [and crushed gravel] composed of naturally formed particles of stone.
  - .3 Light weight aggregate, including slag and expanded shale.
  - .4 Reclaimed asphalt pavement.
  - .5 Reclaimed concrete material.

**2.2 SOURCE QUALITY CONTROL**

- .1 Inform Owners' Representative of proposed source of aggregates and provide access for sampling [4] weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Owners' Representative 2 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
  - .1 Visually inspect substrate in presence of Owner or Owners' Representative.
  - .2 Inform Owner or Owners' Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with topsoil stripping. only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Owner or Owners' Representative.

### 3.2 PREPARATION

- .1 Topsoil stripping:
  - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
  - .2 Begin topsoil stripping of areas as indicated on Drawings and after area has been cleared of grasses, weeds and brush, and removed from site.
  - .3 Strip topsoil to depths as indicated on Drawings. Avoid mixing topsoil with subsoil.
  - .4 Stockpile in locations as approved Owner or Owners' Representative. Stockpile height not to exceed [2] m.
  - .5 Dispose of topsoil to location as approved by Owner or Owners' Representative.
- .2 Aggregate source preparation:
  - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
  - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
  - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
  - .4 Trim off and dress slopes of waste material piles and leave site in neat condition.
  - .5 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .3 Processing:
  - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
  - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
    - .1 Use methods and equipment approved in writing by Owner or Owners' Representative.
  - .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
  - .5 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
    - .1 Use only equipment approved in writing by Owner or Owners' Representative.
- .6 Stockpiling:

- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Owner or Owners' Representative. Do not stockpile on completed pavement surfaces.
- .2 Stockpile aggregates in sufficient quantities to meet project schedules.
- .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
- .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
- .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Owner or Owners' Representative within 48 hours of rejection.
- .7 Stockpile materials in uniform layers of thickness as follows:
  - .1 Maximum 1.5 m for coarse aggregate and base course materials.
  - .2 Maximum 1.5 m for fine aggregate and sub-base materials.
  - .3 Maximum 1.5 m for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

### 3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by Owner or Owners' Representative.
- .5 Waste Management: separate waste materials 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.
- .6 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

- .7 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to Owner or Owners' Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 32 91 19.13 Topsoil Placement and Grading
- .2        Section 32 93 10 Trees, Shrubs and Groundcover Planting

**1.2                MEASUREMENT PROCEDURES**

- .1        Measure following items in hectares within limits as indicated:
  - .1        Clearing.
  - .2        Grubbing.
  - .3        Close cut clearing.
  - .4        Underbrush clearing.
- .2        Measure clearing isolated trees and grubbing isolated tree stumps as number of isolated trees cleared and number of isolated stumps grubbed.

**1.3                REFERENCE STANDARDS**

- .1        U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1        EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .2        City of New Westminster Design Requirements and Technical Standards document.
- .3        City of New Westminster Servicing Standards Manual and Construction Standards.

**1.4                DEFINITIONS**

- .1        Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2        Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.
- .3        Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees and disposing of felled trees and debris.
- .4        Underbrush clearing consists of removal from treed areas of undergrowth, deadwood, and disposing of fallen timber and surface debris.
- .5        Grubbing consists of excavation and disposal of stumps and roots boulders and rock fragments of specified size to not less than specified depth below existing ground surface. Use excavated site material as fill where specified on landscape drawings.
- .6        EAB refers to Emerald Ash Borer a non-native, invasive beetle that is highly destructive to ash trees where it occurs.

- .7 Woodchips in the context of EAB consist of untreated, raw bark and wood fragments broken or shredded from logs or branches. Woodchips are to be less than 2.5 cm in at least any two dimensions.
- .8 Firewood in the context of EAB consists of non-manufactured, solid wood material, with or without bark, cut into sizes less than 1.2 metres long and less than 25 cm in diameter which may be handled manually.
- .9 Logs in the context of EAB consist of untreated, raw wood. Refer to the landscape plans and details for the log's minimum size requirements.
- .10 Enclosed vehicle in the context of EAB consist of any vehicle transporting regulated wood material that is equipped to preclude the loss of materials or the escape of EAB while in transit.

## **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples:
  - .1 Submit 3 samples of each material listed below for approval prior to delivery of materials to project site.
  - .2 Tree wound paint: one litre can with manufacturer's label.
  - .3 Herbicide: one litre can with manufacturer's label.
- .3 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Provide manufacturer's installation instructions.

## **1.6 QUALITY ASSURANCE**

- .1 Do construction occupational health and safety in accordance with Provincial Health and Safety Requirements.
- .2 Safety Requirements: worker protection.
  - .1 Workers must wear eye protection, dust masks, protective clothing, respirators, long sleeved clothing, and gloves when applying herbicide materials.
  - .2 Workers must wear dust masks, safety boots, protective clothing, gloves, respirators, eye protection, long sleeved clothing, and safety vests when clearing and grubbing.
  - .3 Workers must not eat, drink or smoke while applying herbicide material.
  - .4 Clean up spills of preservative materials immediately with absorbent material and safely discard to landfill.

## **1.7 STORAGE AND PROTECTION**

- .1 Prevent damage to utility lines trees fencing root systems of trees water courses landscaping shrubs existing pavement natural features site appurtenances bench marks which are to remain.
  - .1 Repair damaged items to approval the Owner or Owners' Representative.
  - .2 Replace trees designated to remain, if damaged, as directed City Arborist.

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**1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Consider felled timber from which saw logs, pulpwood, posts, poles, ties, or fuel wood can be produced as saleable timber.
- .3 Ash wood mixed with the wood of other species is to all be managed and disposed of as ash wood.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Bituminous based paint of standard manufacture specially formulated for tree wounds.
- .2 Soil Material for Fill:
  - .1 Excavated soil material: free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, deleterious, or objectionable materials.
  - .2 Remove and store soil material for reuse.

**Part 3 Execution**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.2 PREPARATION**

- .1 Inspect site and verify with Owner or Owners' Representative items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
  - .1 Notify City Representative immediately of damage to or when unknown existing utility lines are encountered.
  - .2 When utility lines which are to be removed are encountered within area of operations, notify City Representative in ample time to minimize interruption of service.
- .3 Notify utility authorities before starting to clear and grub.



- .4 Keep roads and walks free of dirt and debris.

### **3.3 APPLICATION**

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

### **3.4 CLEARING**

- .1 Clearing includes felling, trimming, cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including snags, brush, downed timber, rubbish occurring within cleared areas.
- .2 Clear as indicated by Owner or Owners' Representative, by cutting at height of not more than 150 mm above ground.
- .3 Cut down trees or cut off branches overhanging area cleared as directed by the Arborist.
- .4 Cut off unsound branches on trees designated to remain as directed by Arborist.
- .5 Apply herbicide in accordance with manufacturer's label to top surface of stumps designated not to be removed.

### **3.5 CLOSE CUT CLEARING**

- .1 Close cut clearing to within 150 mm of ground surface.
- .2 Perform close cut clearing by hand so that existing muskeg is not damaged.
- .3 Cut down trees/ off branches overhanging area cleared as directed by the Arborist.
- .4 Cut off unsound branches on trees designated to remain as directed by the Arborist.

### **3.6 ISOLATED TREES**

- .1 Cut off / remove isolated trees as directed the Arborist.
- .2 Grub out isolated tree stumps.
- .3 Prune individual trees as indicated.
- .4 Trim trees designated to be left standing within cleared areas of dead branches 4 cm or more in diameter; and trim branches to heights as indicated.
- .5 Cut limbs and branches to be trimmed close to bole of tree or main branches.
- .6 Paint cuts more than 3 cm in diameter with approved tree wound paint.

### **3.7 UNDERBRUSH CLEARING**

- .1 Clear underbrush from areas as indicated on drawings.

### **3.8 GRUBBING**

- .1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.
- .2 Grub out stumps and roots to not less than 150 mm below ground surface.

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- .3 Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension, but less than 0.25 m<sup>3</sup>.
  - .4 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

### **3.9 REMOVAL AND DISPOSAL**

- .1 Remove grubbed and cleared materials as indicated on drawings.
- .2 Cut timber greater than 125 mm diameter. Stockpiled timber becomes property of the City .
- .3 Place mulch and spread cleared and grubbed vegetative material on site as directed by Owner or Owners' Representative.
- .4 Remove diseased trees identified by the Arborist and dispose of this material to approval of City Representative.
- .5 Any ash wood materials in the form of wood chips or logs are to be scattered widely, to maximum 75 mm depth as directed by Owner or Owners' Representative.
- .6 Any ash wood materials or firewood which is removed from the site is to be transported in an enclosed vehicle and disposed of at an authorized disposal facility.
- .7 The Contractor is responsible for monitoring all cut ash wood and firewood until it is properly disposed of as determined by the Owner.

### **3.10 FINISHED SURFACE**

- .1 Leave ground surface in condition suitable for stripping of topsoil to approval of Owners' Representative.

### **3.11 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, flagging tape, tools, and equipment.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 31 11 00 Clearing and Grubbing
- .2        Section 31 14 13 Soil Stripping
- .3        Section 31 23 33.01 Excavating, Trenching, and Backfilling

**1.2                REFERENCE STANDARDS**

- .1        U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1        EPA 832R92005, Storm Water Management for Construction Activities:  
            Developing Pollution Prevention Plans and Best Management Practices.

**Part 2            Products**

**2.1                NOT USED**

- .1        Not Used.

**Part 3            Execution**

- .1        during removal.

**3.2                STRIPPING OF TOPSOIL**

- .1        Ensure that procedures are conducted in accordance with applicable Municipal requirements.
- .2        Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .3        Handle topsoil only when it is dry and warm.
- .4        Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation at approved disposal facility.
- .5        Remove brush from targeted area by non-chemical means and dispose of through at approved disposal facility.
- .6        Strip topsoil to depths as indicated on drawings.
  - .1        Avoid mixing topsoil with subsoil.
- .7        Pile topsoil in berms in locations as approved by Owner or Owners' Representative.
  - .1        Stockpile height not to exceed 3 m.
- .8        Dispose of unused off-site in location as approved by Owner or Owners' Representative.
- .9        Protect stockpiles from contamination and compaction.

- .10 Cover topsoil that has been piled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

### **3.3 PREPARATION OF GRADE**

- .1 Verify that grades are correct and notify Owners' Representative if discrepancies occur and do not begin work until instructed by Owners' Representative .
  - .1 Grade area only when soil is dry to lessen soil compaction.
  - .2 Grade soil establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage.

### **3.4 PLACING OF TOPSOIL**

- .1 Place topsoil only after Owners' Representative has accepted subgrade.
- .2 Spread topsoil during dry conditions in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.
- .3 Establish traffic patterns for equipment to prevent driving on topsoil after it has been spread to avoid compaction.
- .4 Cultivate soil following spreading procedures.

### **3.5 SUB-SOILING**

- .1 Apply sub-soil, following spreading and cultivating procedures to designated areas to improve drainage and agricultural potential of soil.
- .2 Work sub-soil area following natural grade contour lines, with vibrating sub-soiler to depth of 30 cm.
- .3 Cross sub-soil the area following the first pass.
- .4 Cultivate the soil with a chain harrow to de-clod the soil.

### **3.6 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 32 11 16.01 Granular Sub-Base
- .2    Section 31 11 00 Clearing and Grubbing
- .3    Section 32 15 40 Crushed Stone Surfacing
- .4    Section 32 14 13 Precast Concrete Unit Paving

**1.2                MEASUREMENT PROCEDURES**

- .1    Excavated materials will be measured in cubic metres in their original location.
  - .1    Common excavation quantities measured will be actual volume removed within following limits:
    - .1    Width for trench excavation as indicated.
    - .2    Width for excavation for structures as indicated.
    - .3    Depth from ground elevation surface of sidewalk immediately prior to excavation, to elevation as indicated by Owners' Representative.
  - .2    Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
  - .3    Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.
  - .4    Placing and spreading of topsoil will be measured for payment in cubic metres calculated from cross sections taken in area of excavation from original location.
    - .1    If double handling of topsoil is directed by Owner or Owners' Representative (stockpiling and later placing), then quantities will be measured twice; on excavation from original location and on excavation from stockpile.

**1.3                REFERENCE STANDARDS**

- .1    American Society for Testing and Materials International (ASTM)
  - .1    ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2    ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3    ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.
  - .4    ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5    ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6    ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.4 DEFINITIONS**

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
  - .1 Rock: solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
  - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping, and seeding.
  - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 1 inch 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Use excavated material to site fill were indicated on landscape drawings.
- .6 Borrow material: material obtained from locations outside area to be graded and required for construction of fill areas or for other portions of Work.
- .7 Recycled fill material: material, considered inert, obtained from alternate sources, and engineered to meet requirements of fill areas.
- .8 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
    - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80

0.005 mm	0 - 45
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- .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .9 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.
- .10 Boulder rocks minimum size requirements where indicated on landscape plans and details.

## 1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
  - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
  - .2 Submit to city Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
  - .3 Submit to Owners' Representative written notice when bottom of excavation is reached.
- .3 Preconstruction Submittals:
  - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
  - .2 Submit records of underground utility locates, indicating location plan of existing utilities as found in field and clearance record from utility authority.
- .4 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Inform Owner or Owners' Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
  - .3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
  - .4 Ship samples prepaid to Owners' Representative, in tightly closed containers to prevent contamination and exposure to elements.
  - .5 At least 4 weeks prior to beginning Work, inform Owners' Representative source of fly ash and submit samples to Owners' Representative.
    - .1 Do not change source of Fly Ash without written approval of Owners' Representative.

## 1.6 QUALITY ASSURANCE

- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
- .2 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Canada.
- .4 Keep design and supporting data on site.

- .5 Engage services of qualified professional Engineer who is registered or licensed in , Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .6 Do not use soil material until written report of soil test results are approved by Owner or Owners' Representative.
- .7 Health and Safety Requirements:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert excess aggregate materials from landfill to local facility for reuse as directed by City Representative.

## **1.8 EXISTING CONDITIONS**

- .1 Examine soil report.
- .2 Buried services:
  - .1 Before commencing work verify location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .5 Prior to beginning excavation Work, notify City of New Westminster establish location and state of use of buried utilities and structures. City of New Westminster to clearly mark such locations to prevent disturbance during Work.
  - .6 Confirm locations of buried utilities by careful test excavations.
  - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as directed by the city representative.
  - .8 Where utility lines or structures exist in area of excavation, obtain direction of City Representative before re-routing.
  - .9 Record location of maintained, re-routed and abandoned underground lines.
  - .10 Confirm locations of recent excavations adjacent to area of excavation.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Type 1 and Type 2 fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.



- .2 Gradations to be within limits specified when tested to ASTM C136 ASTM C117. Sieve sizes to CAN/CGSB-8.2 CAN/CGSB-8.1.

- .3 Table:

Sieve Designation	% Passing	
Type 1	Type 2	
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

- .2 Type 3 fill: selected material from excavation or other sources, approved by Owner or Owners' Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials..

### Part 3 Execution

#### 3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

#### 3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and

#### 3.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.

- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to City Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

### **3.4 STRIPPING OF TOPSOIL**

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of weeds grasses brush and removed from site.
- .2 Strip topsoil to depths as indicated.
  - .1 Do not mix topsoil with subsoil.
- .3 Stockpile in locations as directed by City Representative.
  - .1 Stockpile height not to exceed 2 m and should be protected from erosion.
- .4 Dispose of unused topsoil to location as directed by City Representative .

### **3.5 STOCKPILING**

- .1 Stockpile fill materials in areas designated by City Representative
  - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

### **3.6 EXCAVATION**

- .1 Advise City Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations, and dimensions as indicated.
- .3 Remove walks demolished foundations and rubble and other obstructions encountered during excavation.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
  - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .6 For trench excavation, unless otherwise authorized by City Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .7 Keep excavated and stockpiled materials safe distance away from edge of trench.
- .8 Restrict vehicle operations directly adjacent to open trenches.
- .9 Dispose of surplus and unsuitable excavated material in approved location on site.

- .10 Do not obstruct flow of surface drainage or natural watercourses.
- .11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .12 Notify Owners' Representative when bottom of excavation is reached.
- .13 Obtain Owners' Representative approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth.
- .15 Correct unauthorized over-excavation as follows:
  - .1 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.
- .16 Hand trim, make firm and remove loose material and debris from excavations.
  - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
  - .2 Clean out rock seams and fill with concrete mortar or grout to approval of City Representative.

### **3.7 FILL TYPES AND COMPACTION**

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698 ASTM D1557
  - .1 Place unshrinkable fill in areas as indicated.

### **3.8 BACKFILLING**

- .1 Vibratory compaction equipment: Industrial vibratory plate compactor or Jumping Jack.
- .2 Do not proceed with backfilling operations until completion of following:
  - .1 Owners' Representative has inspected and approved installations.
  - .2 Owners' Representative has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of concrete formwork.
  - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

- .3 Place layers simultaneously on both sides of installed Work to equalize loading.  
Difference.
- .7 Place reused fill in areas as indicated.

**3.9 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects.
- .2 Replace topsoil as indicated.
- .3 Clean and reinstate areas affected by Work as.
- .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 32 91 19.13 Topsoil Placement and Grading
- .2        Section 32 93 10 Trees, Shrubs and Ground Cover Planting
- .3        Section 31 11 00 Clearing and Grubbing
- .4        Section 01 56 00 Temporary Barriers and Enclosures

**1.2                REFERENCE STANDARDS**

- .1        ASTM International
  - .1        ASTM A1064/A1064M-13, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .2        CSA Group
  - .1        CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
- .3        Health Canada - Pest Management Regulatory Agency (PMRA)
  - .1        National Standard for Pesticide Education, Training and Certification in Canada (1995).
- .4        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .5        Department of Justice Canada (Jus)
  - .1        Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .2        Fertilizers Act (R.S. 1985, c. F-10).
  - .3        Fertilizers Regulations (C.R.C., c. 666).
  - .4        Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

**1.3                DEFINITIONS**

- .1        Mycorrhiza: association between fungus and roots of plants. This symbiosis enhances plant establishment in newly landscaped and imported soils.

**1.4                ADMINISTRATIVE REQUIREMENTS**

- .1        Scheduling:
  - .1        Obtain approval from City Representative of schedule indicating beginning of Work.

**1.5                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Provide in accordance with Section 01 33 00- Submittal Procedures.
- .2        Product Data:

- .1 Provide manufacturer's instructions, printed product literature and data sheets for tree and shrub preservation materials and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Provide monthly written reports on maintenance during warranty period, to Owner or Owners' 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 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43- Environmental Procedures 01 35 29.06- Health and Safety Requirements.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect tree and shrub preservation materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **1.7 MAINTENANCE DURING WARRANTY PERIOD**

- .1 From time of acceptance by City 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 Apply pesticides in accordance with National Standard for Pesticide Education, Training and Certification in Canada, Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Owner or Owners' Representative prior to application.
  - .3 Apply fertilizer in early spring at manufacturer's suggested rate
  - .4 Remove dead, broken or hazardous branches from plant material. Dispose of debris off-site at an approved facility.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Tree, shrubs, and groundcovers:
  - .1 Refer to the landscape planting plan for the plant species, spacing, size, and quantities.

- .2 Refer to the landscape plans for the City of New Westminster Tree Planting Standards
- .3 If discrepancies were found between the Tree Planting standards on the landscape plans and these specifications, the Plans prevails.
- .2 Fill:
  - .1 Type (A): clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter.
  - .2 Type (B): excavated soil, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients (salt, oil, etc.). Excavated material shall be approved by Owner or Owners' Representative before use as fill.
- .3 Coarse washed stones: 35-75mm diameter clean round hard stone.
- .4 Fertilizer:
  - .1 To Canada Fertilizer Act and Fertilizers Regulations.
  - .2 Complete, commercial, slow release with 35% of nitrogen content in water-insoluble form.
- .5 Tree protection fence Barriers as per city of New Westminster requirements.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for tree and shrub preservation installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect.
  - .2 Inform Owners' 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 Owners' Representative.

#### **3.2 IDENTIFICATION AND PROTECTION**

- .1 Tree protection to be installed prior to the start of any on site work.
- .2 Identify plants and limits of root systems to be preserved as approved by the Arborist
- .3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by the Arborist.
- .4 Ensure no root pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT).

#### **3.3 TRUNK PROTECTION**

- .1 Install board cladding vertically around the perimeter of designated deciduous trees within the active work zone.

### **3.4 ROOT CURTAIN SYSTEM**

- .1 Identify limits for required construction excavation as approved by the Arborist.
- .2 Prior to construction excavation, hand dig trench minimum 500mm wide x 1500mm deep, along perimeter of excavation limits.
- .3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.
- .4 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
  - .1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.
  - .2 Incorporate with mixture grade 2:12:8ratio fertilizer (dry) at rate of 1.5kg/m<sup>3</sup>.
- .5 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150mm in depth. Compact each layer to 85% Standard Proctor Density.
- .6 Protect root curtain from damage during construction operations.
- .7 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.
- .8 Protect root curtain before and during backfill operations. Ensure root curtain is cut down to 150mm below finished grade and remove cut material.

### **3.5 AIR LAYERING SYSTEM**

- .1 Using manual methods, carefully remove turf, plants, leaves and organic matter in area of root system, dispose of plant matter through compost site and slightly loosen topsoil surface. Avoid damage to root system.
- .2 Remove temporary protective covering from vent pipe openings. Install protective caps flush with finished grade.

### **3.6 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES**

- .1 Centre line location and limits of trench/tunnel excavation to be approved by city Representative prior to excavation.
- .2 Excavate manually within zone of root system. Do not sever roots greater than 40 mm diameter except at greater than 500 mm below existing grade. Protect roots and cut roots cleanly with sharp disinfected tools.
- .3 Excavate tunnel under centre of tree trunk using methods and equipment approved by the Arborist
- .4 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree as approved by the Arborist
- .5 Complete tunnelling and backfilling at tree within 2weeks of beginning Work.

### **3.7 LOWERING GRADE AROUND EXISTING TREE**

- .1 Begin Work in accordance with schedule approved by the Arborist
- .2 Cut slope not less than 500mm from tree trunk to new grade level.
- .3 Excavate to depths as indicated. Protect root zone designated to remain from damage.



- .4 When severing roots at excavation level, cut roots with clean, sharp tools.
- .5 Cultivate excavated surface manually to 15mm depth.
- .6 Prepare homogeneous soil mixture as per CSLA standards.
- .7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.
- .8 Water entire root zone to optimum soil moisture level.
- .9 Install surface cover of seeding as indicated

**3.8 PRUNING**

- .1 Prune in accordance with Section 32 93 43.01- Tree Pruning.
- .2 Prune crown to compensate for root loss while maintaining general form and character of plant. Dispose of debris through alternative disposal, mulching, or composting.

**3.9 ANTI-DESICCANT**

- .1 Apply anti-desiccant to foliage where applicable.

**3.10 VERIFICATION**

- .1 Verification requirements in accordance with Section 01 47 17- Sustainable Requirements: Contractor's Verification, include:
  - .1 Materials and resources.
  - .2 Storage and collection of recyclables.
  - .3 Construction waste management.
  - .4 Local/regional materials.
  - .5 Low-emitting materials.

**3.11 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

**END OF SECTION**

**Part 1        General**

**1.1            RELATED REQUIREMENTS**

- .1        Section 32 14 13 Precast Concrete Unit Paving

**1.2            MEASUREMENT AND PAYMENT**

- .1        Measure granular sub-base in cubic metres of material incorporated into Work and accepted by City Representative .
- .2        Measure excavation of sub-base and subgrade materials to correct deficiencies in subgrade discovered during proof rolling as common excavation.
  - .1        Measure backfill of subgrade with common materials as common excavation and subgrade compaction.
  - .2        Measure backfill of subgrade with sub-base material and replacement of sub-base material under this Section.
- .3        Measure hauling granular sub-base material in cubic metre-kilometres, computed by taking product of number of cubic metres of material placed multiplied by haul distance in kilometres.
  - .1        Measure haul distance from source of material to centre of volume of material after placing, measured along shortest route determined by City Representative as being feasible and satisfactory.
- .4        Measure water in units of 1000 L for water authorized by City Representative and applied.
- .5        Measure compaction of granular sub-base in hours for particular compaction units employed including operator, fuel and maintenance as shown on approved recording devices.

**1.3            REFERENCE STANDARDS**

- .1        ASTM International
  - .1        ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2        ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3        ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4        ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
  - .5        ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .6        ASTM D1557-09, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).

- .7 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
- .8 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 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.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Regional Materials: submit evidence that project incorporates required percentage 20 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations.
  - .2 Replace defective or damaged materials with new.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Granular sub-base material: following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2 CAN/CGSB-8.1.

.3 Table

Sieve Designation	% Passing			
100 mm	-	-	-	-
75 mm	100	100	100	-
50 mm	-	-	-	100
37.5 mm	-	-	-	-

25 mm	55-100	-	-	60-100
19 mm	-	-	-	-
12.5 mm	-	-	-	38-70
9.5 mm	-	-	-	-
4.75 mm	25-100	25-85	-	22-55
2.00 mm	15-80	-	-	13-42
0.425 mm	4-50	5-30	0-30	5-28
0.180 mm	-	-	-	-
0.075 mm	0-8	0-10	0-8	2-10

- .4 Other properties as follows:
  - .1 Liquid Limit: to ASTM D4318, Maximum 25.
  - .2 Plasticity Index: to ASTM D4318, Maximum 6.
  - .3 Los Angeles degradation: to ASTM C131.
    - .1 Maximum loss by mass: 40 50 %.
  - .4 Particles smaller than 0.02 mm: to ASTM D422, Maximum 3%.
  - .5 Soaked CBR: to ASTM D1883, Minimum 40 when compacted to 100% of ASTM D1557.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for granular sub-base installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Owner or Owners' 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 Owner or Owners' Representative.

#### **3.2 PREPARATION**

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.3 PLACING

- .1 Place granular sub-base after subgrade is inspected and approved by Owners' Representative .
- .2 Construct granular sub-base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Begin spreading sub-base material on crown line or high side of one-way slope.
- .6 Place granular sub-base materials using methods which do not lead to segregation or degradation.
- .7 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .8 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
  - .1 Owner or Owners' Representative may authorize thicker lifts if specified compaction can be achieved.
- .9 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .10 Remove and replace portion of layer in which material has become segregated during spreading.

### 3.4 COMPACTION

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Owner or Owners' Representative before use.
- .3 Equipped with device that records hours of actual work, not motor running hours.
- .4 Compact to density of not less than 98% maximum dry density in accordance with ASTM D1557 ASTM D698.
- .5 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .6 Apply water as necessary during compaction to obtain specified density.
- .7 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Owner or Owners' Representative .
- .8 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

### 3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11 - Cleaning.

**3.6 SITE TOLERANCES**

- .1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

**3.7 PROTECTION**

- .1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Owners' Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 32 11 16.01 Granular Sub-Base
- .2            Section 31 05 16 Aggregate Materials

**1.2                PRICE AND PAYMENT PROCEDURES**

- .1            Measurement procedures:
  - .1            Measure precast concrete paving for payment in square metres.

**1.3                REFERENCE STANDARDS**

- .1            ASTM International
  - .1            ASTM C136-13, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .2            ASTM C979/C979M-10, Standard Specification for Pigments for Integrally Colored Concrete.
- .2            CSA Group
  - .1            CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2            CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
  - .3            CSA A231.1/A231.2-06(R2010), Precast Concrete Paving Slabs/Precast Concrete Pavers.
  - .4            CSA A283-06(R2011), Qualification Code for Concrete Testing Laboratories.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .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 precast concrete steppingstones and concrete irregular shape steps and include product characteristics, performance criteria, physical size, finish and limitations.
- .3            Shop Drawings:
  - .1            Submit drawings stamped and signed by professional engineer registered or licensed in Canada.
- .4            Samples:
  - .1            Submit full size sample of each type of pavers.
- .5            Test and Evaluation Reports:
  - .1            Submit following sampling and testing data:

- .1 Precast concrete steppingstones and concrete irregular shape steps sampling and testing.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

## **1.5 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Installer: company or person specializing in precast concrete paver installations with 5 years of documented experience.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect Precast concrete steppingstones and concrete irregular shape steps from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 PRECAST CONCRETE IRREGULAR SHAPE STEPS UNITS**

- .1 Precast concrete steps: to CSA A23.1/A23.2 and as follows:
  - .1 Size: 1219 x 711 x 178 mm
  - .2 Shape: irregular.
  - .3 Colour: Pacific grey.
  - .4 Supplier: Barkman Concrete or equally approved.
- .2 Manufactured in moulds, with spacers, suitable for installation and delivered on site in cubes of laying panels, in protective wrapping.
- .3 Pigment in concrete pavers: to ASTM C979/C979M.SPEC NOTE: Select sand for bedding and joint material, in accordance with local quality and availability.

### **2.2 CLEANING COMPOUND**

- .1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.



- .2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for precast concrete unit paving installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect.
  - .2 Inform Owner or Owners' 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 Owner or Owners' Representative.

#### **3.2 STRUCTURAL SURFACE**

- .1 Verify that structural surfaces conform to levels and compaction required for installation of Steps. If discrepancies occur, notify Owner or Owners' Representative, and do not commence work until instructed by Owner or Owners' Representative.
- .2 Ensure that structural surface is not frozen or standing water is present during installation.

#### **3.3 INSTALLATION OF CONCRETE STEPS UNITS**

- .1 Lay units as indicated on Landscape detail drawings,
- .2 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.

#### **3.4 CONCRETE STEPS UNITS CLEANING**

- .1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound.
- .2 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.
- .3 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.
- .4 Final surface to be free of contamination.

#### **3.5 FIELD QUALITY CONTROL**

- .1 Retain concrete testing laboratory accredited in accordance with CSA A283.
- .2 Sample and test in accordance CSA A23.1/A23.2.

#### **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 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 32 14 13 Precast Concrete Unit Paving
- .2 Section 32 11 16.01 Granular Sub-base
- .3 Section 31 05 16 Aggregate Materials

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measure granular sub-base in cubic metres of material incorporated into Work and accepted by City Representative.
- .2 Measure granular topping in cubic metres of material incorporated into Work and accepted by City Representative.

**1.3 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .2 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .3 ASTM D4318-05, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - .4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Scheduling: co-ordinate paving schedule to minimize interference with normal use of premises.

**1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Store crushed stone as and where directed by City Representative .

**Part 2 Products**

**2.1 MATERIALS**

- .1 Granular sub-base: in accordance with Section 32 11 16.01 Granular Sub-Base.
- .2 Crushed aggregate surfacing

**Part 3 Execution**

**3.1 SUBGRADE**

- .1 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base.

**3.2 GRANULAR SUB-BASE**

- .1 Granular sub-base material minimum thickness: as indicated on drawings.
- .2 Place material in uniform layers not to exceed indicated compacted thickness.
  - .1 Compact layer to 95 % Standard Density in accordance with ASTM D698.

**3.3 GRANULAR TOPPING**

- .1 Place granular topping to compacted thickness as indicated.
- .2 Place material in uniform layers not to exceed indicated mm compacted thickness.
  - .1 Compact layer to 95 % Standard Density in accordance with ASTM D698.

**3.4 FIELD QUALITY CONTROL**

- .1 Inspection and testing of crushed stone paving: carried out by designated testing laboratory.

**3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11 - Cleaning.

**3.6 PROTECTION**

- .1 Prevent damage to landscaping, fences, curbs, roads sidewalks, trees, and adjacent property.
  - .1 Repair damages incurred.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 32 11 16.01 Granular Sub-Base
- .2            Section 31 23 33.01 Excavating, Trenching and Backfilling

**1.2                REFERENCE STANDARDS**

- .1            CSA International
  - .1            CAN/CSA-Z809-08, Sustainable Forest Management.
- .2            Forest Stewardship Council (FSC)
  - .1            FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .3            Sustainable Forestry Initiative (SFI)
  - .1            SFI-2010-2014 Standard.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Product Data:
  - .1            Provide manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.
- .3            Shop Drawings:
  - .1            Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

**1.4                CLOSEOUT SUBMITTALS**

- .1            Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

**1.5                QUALITY ASSURANCE**

- .1            Sustainable Standards Certification:
  - .1            Certified Wood: Provide listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

**1.6                DELIVERY, STORAGE AND HANDLING**

- .1            Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2            Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3            Storage and Handling Requirements:

- .1 Store materials off ground and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect furnishings from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

**Part 2 Products**

**2.1 BENCH (optional item)**

- .1 Owner supplied, or to be specified at a future phase.

**2.2 LOGS (optional item)**

- .1 From existing site, or to be specified at a future phase.

**2.3 Play Stumps (optional item)**

- .1 From existing site, or to be specified at a future phase.

**2.4 Trail wayfinding signage**

- .1 Owner supplied, as per landscape details.

**2.5 Bat house**

- .1 as per landscape details.

**2.6 Barn swallow platform**

- .1 as per landscape details.

**2.7 Raptor perch**

- .1 as per landscape details.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Owner or Owners' Representative.
  - .2 Inform Owner or Owners' 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 Owner or Owners' Representative .

**3.2 PREPARATION**

- .1 Locate and protect utility lines.

- .2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work

**3.3 INSTALLATION**

- .1 Assemble furnishings in accordance with manufacturer's written recommendations.
- .2 Install as indicated on detail drawings.
- .3 Touch-up damaged finishes to approval of Owners' Representative.

**3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.

**3.5 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by site furnishings installation.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 32 01 90.33 Tree and Shrub Preservation
- .2        Section 31 11 00 Clearing and Grubbing
- .3        Section 01 56 00 Temporary Barriers and Enclosures
- .4        Section 32 93 10 Trees, Shrubs and Ground Cover Planting

**1.2                MEASUREMENT PROCEDURES**

- .1        Preparation of sub-grade for placing of topsoil will be measured in square metres of area prepared.
- .2        Topsoil stripping will be measured in cubic metres of stockpiled topsoil and volume will be determined by average end area method.
- .3        Measure placing of topsoil in cubic metres removed from stockpile.
  - .1        Stockpiles will be measured by Contractor and volume of topsoil removed calculated by average end area method.
- .4        Measure supply and application of soil amendments, including fertilizer, in standard commercial units of weight/volume .
- .5        Measure supplying, placing and spreading topsoil in cubic metres determined by truck box measurement as loaded.
- .6        Measure supplying, placing and spreading topsoil in cubic metres as determined from actual surface area covered and depth of topsoil specified.
  - .1        Specified depth of topsoil: measured and approved by Owners' Representative after settlement and consolidation as specified.
- .7        Measure finish grading in square metres from actual surface measurements as determined by Owners' Representative .

**1.3                PAYMENT**

- .1        Testing of topsoil: **Client** will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

**1.4                REFERENCE STANDARDS**

- .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.
- .3        Canadian Landscape Standard (CLS), 2<sup>nd</sup> Edition
- .4        U.S. Environmental Protection Agency (EPA)/Office of Water



- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

## **1.5 DEFINITIONS**

- .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) (B).

## **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

## **1.7 QUALITY ASSURANCE**

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM).

## **Part 2 Products**

### **2.1 TOPSOIL**

- .1 Topsoil for planting beds and seeded areas: As per CANADIAN LANDSCAPE STANDARD (CLS) 2ND EDITION Standards.

### **2.2 SOIL AMENDMENTS**

- .1 Fertilizer: as per CLS
  - .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, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
    - .6 Ph value: 6.5 to 8.0.
- .2 Peatmoss: as per CLS
  - .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 coarse textured, as per CLS
- .4 Organic matter: as per CLS, compost Category A, B 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 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications and as per CLS.
- .6 Limestone: as per CLS:
  - .1 Ground agricultural limestone.
  - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .7 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 CONTROL**

- .1 Advise Owners' 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 a client approved testing laboratory designated by Contractor.
  - .1 Soil sampling, testing, and analysis to be in accordance with Provincial standards.

## **Part 3 Execution**

### **3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### **3.2 STRIPPING OF TOPSOIL**

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of weeds brush grasses and removed from site.
- .2 Strip topsoil to depths as indicated.
  - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as as indicated.
  - .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 as directed by City Representative .
- .5 Protect stockpiles from contamination and compaction.

### **3.3 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are correct.
  - .1 If discrepancies occur, notify Owners' Representative and do not commence work until instructed by Owners' 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 as indicated.
  - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

### **3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL**

- .1 Place topsoil after Owners' Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 Spread topsoil as indicated and complying with the CLS.
- .4 Manually spread topsoil/planting soil around trees, shrubs, and obstacles.

### **3.5 SOIL AMENDMENTS**

- .1 For planting beds: apply and thoroughly mix soil amendments into full specified depth of topsoil, and complying with the CLS.

### **3.6 FINISH GRADING**

- .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 Owners' Representative.
  - .1 Leave surfaces smooth, uniform and firm against deep foot printing.

**3.7 ACCEPTANCE**

- .1 Owner or Owners' Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

**3.8 SURPLUS MATERIAL**

- .1 Dispose of materials except topsoil not required where directed by City Representative.

**3.9 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 32 91 19.13 Topsoil Placement and Fine Grading

**1.2                MEASUREMENT AND PAYMENT**

- .1            Measure hydraulic seeding square metres of for:
  - .1            Pollinator meadow.
  - .2            Grass meadow
- .2            Measure maintenance during warranty period of areas seeded in square metres.
- .3            Payment for seeding made at unit price bid of actual area surface measurements taken and computed by Owners' Representative .

**1.3                ADMINISTRATIVE REQUIREMENTS**

- .1            Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.
- .2            Scheduling:
  - .1            Schedule hydraulic seeding to coincide with preparation of soil surface.
  - .2            Schedule hydraulic seeding using grass mixtures and mixtures containing mixes indicated on drawings and between dates recommended by the City.

**1.4                REFERENCE STANDARDS**

- .1            Canadian Landscape Standard (CLS) 2<sup>nd</sup> Edition.

**1.5                ACTION AND INFORMATIONAL SUBMITTALS**

- .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 seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
  - .2            Submit 2 electronic copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements.
- .3            Submit in writing to Owner or Owners' Representative:
  - .1            Volume capacity of hydraulic seeder in litres.
  - .2            Amount of material to be used per tank based on volume.
  - .3            Number of tank loads required per hectare to apply specified slurry mixture per hectare.
- .4            Samples:
- .5            Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

- .6 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

## **1.6 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member in Good Standing of British Columbia Landscape & Nursery Association (BCLNA).
  - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
  - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with CLS .
- .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 Inoculant containers to be tagged with expiry date.
- .3 Storage and Handling Requirements:
  - .1 Store fertilizer 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 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19- Waste Management and Disposal.
- .5 Packaging Waste Management: remove for reuse and return crates, and pallets, as specified in Construction Waste Management Plan 01 74 19- Waste Management and Disposal.

## **1.8 WARRANTY**

- .1 For seeding, 12 months warranty period is extended to 1 full growing season.
- .2 Contractor hereby warrants that seeding will remain free of defects for 1 full growing season.
- .3 End-of-warranty inspection will be conducted by Owner and Owners' Representative.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
  - .1 Grass mixture: "Certified", in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".

- .1 Mixture composition:
  - .1 Refer to Landscape Plans
- .2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
  - .1 Type I mulch:
    - .1 Made from wood cellulose fibre.
    - .2 Organic matter content: 95% plus or minus 0.5%.
    - .3 Value of pH: 6.0.
    - .4 Potential water absorption: 900%.
  - .2 Type II mulch:
    - .1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
- .3 Tackifier: water soluble vegetable carbohydrate powder.
- .4 Water: free of impurities that would inhibit germination and growth.
- .5 Fertilizer:
  - .1 To Canada "Fertilizers Act" and Regulations.
  - .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.
- .6 Inoculants: inoculant containers to be tagged with expiry date.
- .7 Liquid Soil Amendment and Micronutrients:

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Owners' Representative.
  - .2 Inform Owners' 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 Owners' Representative.

#### **3.2 INSTALLERS**

- .1 Use installers members in Good Standing of BCNLA.

**3.3 PROTECTION OF EXISTING CONDITIONS**

- .1 Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.
- .2 Immediately remove any material sprayed where not intended as directed by Owners' Representative .

**3.4 PREPARATION OF SURFACES**

- .1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .2 Fine grade areas to be seeded free of humps and hollows.
  - .1 Ensure areas are free of deleterious and refuse materials.
- .3 Cultivated areas identified as requiring cultivation to depth of 25 mm.
- .4 Ensure areas to be seeded are moist to depth of 150 mm before seeding.
- .5 Obtain Owners' Representative approval of grade and topsoil depth before starting to seed.

**3.5 FERTILIZING PROGRAM**

- .1 Fertilize prior to fine grading applying fertilizer equally distributed in accordance with the following program:

Date Range	Date		Date	Application Rate	Formulation (NPK Ratio)
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]

- .2 Fertilize during establishment and warranty periods applying fertilizer equally distributed in accordance with the following program:

Date Range	Date		Date	Application Rate	Formulation (NPK Ratio)
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]
Between	[ ]	and	[ ]	[kg/ [m <sup>2</sup> </options ><options>>ha]]	[ ]



### **3.6 PREPARATION OF SLURRY**

- .1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Owners' Representative. Supply equipment required for this work.
- .2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.
- .3 After materials are in seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

### **3.7 SLURRY APPLICATION**

- .1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.
- .2 Hydraulic seeding equipment:
  - .1 Slurry tank.
  - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
  - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
  - .4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".
- .3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
  - .1 Using correct nozzle for application.
  - .2 Using hoses for surfaces difficult to reach and to control application.
- .4 Re-apply where application is not uniform.
- .5 Remove slurry from items and areas not designated to be sprayed.

### **3.8 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 recycling or reuse in accordance with Section 01 74 19- 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 Owner or Owners' Representative.

**3.9 PROTECTION**

- .1 Protect seeded areas from trespass until plants are established.
- .2 Remove protection devices as directed by Owner or Owners' Representative.

**3.10 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 Owner or Owners' Representative.
- .3 Grass Mixture:
  - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
  - .2 Mow grass to 75 mm whenever it reaches height of 150 mm. Mulch clippings as directed by Owner or Owners' Representative.
  - .3 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles; water in well.
  - .4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
    - .1 Obtain Owner or Owners' Representative approval in writing if chemical means are used.
  - .5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
- .4 Legume Mixture:
  - .1 Repair minor dead and bare spots as determined by Owner or Owners' Representative to allow establishment of seed prior to acceptance.
  - .2 Repair major dead and bare spots as determined by Owner or Owners' Representative in accordance with site climatic averages and recommendations of local horticultural City representative.
  - .3 Mulch all clippings as directed by Owner or Owners' Representative or City representative.
  - .4 Water seeded areas to maintain optimum soil moisture level for germination and continued growth. Control watering to prevent washouts.

**3.11 ACCEPTANCE**

- .1 Seeded areas will be accepted by Owner or Owners' Representative provided that:
  - .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
  - .2 Areas have been mown at least twice.
  - .3 Areas have been fertilized.
- .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

**3.12 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Perform following operations from time of acceptance until end of warranty period:
  - .1 Repair and reseed dead or bare spots to satisfaction of Owner or Owners' Representative .
  - .2 Mow areas seeded as directed by Owners' Representative.
  - .3 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.
    - .1 Obtain Owners' Representative approval if chemical means are used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 32 01 90.33 Tree and Shrub Preservation
- .2        Section 31 11 00 Clearing and Grubbing
- .3        Section 01 56 00 Temporary Barriers and Enclosures
- .4        Section 32 91 19.13 Topsoil Placement and Grading

**1.2                REFERENCE STANDARDS**

- .1        Agriculture and Agri-Food Canada (AAFC).
  - .1        Plant Hardiness Zones in Canada-2000.
- .2        Canadian Landscape Standard (CLS) 2<sup>nd</sup> Edition.
- .3        Canadian Nursery Landscape Association (CNLA)
  - .1        Canadian Standards for Nursery Stock-2006.
- .4        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .5        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.

**1.3                DEFINITIONS**

- .1        Mycorrhiza: association between fungus and roots of plants. This symbiosis enhances plant establishment in newly landscaped and imported soils.

**1.4                ADMINISTRATIVE REQUIREMENTS**

- .1        Scheduling: obtain approval from Owner or Owners' 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.

**1.5                ACTION AND INFORMATIONAL SUBMITTALS**

- .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.
- .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures 01 35 29.06 - Health and Safety Requirements.
- .3 Samples:
  - .1 Submit samples of mulch and mycorrhiza

## 1.6 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member in Good Standing of BCNLA
  - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
  - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

## 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 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.
- .3 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 CA.
  - .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. Heel-in fibre pots.
    - .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.

## **1.8 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 Contractor hereby warrants that plant material as itemized on plant list plant material over 75 mm caliper will remain free of defects in accordance with General Conditions CCDC GC 12.3, but for 1 full growing season, one time only providing adequate maintenance has been provided.
- .3 End-of-warranty inspection will be conducted by Owner and Owners' Representative.
- .4 Owner or Owners' 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 Refer to planting schedule on planting plan for material selection.
- .2 Type of root preparation, sizing, grading and quality: comply to CLS for Nursery Stock.
  - .1 Plant material must be planted in zone specified as appropriate for its species.
  - .2 Plant material in location appropriate for its species.
- .3 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .4 Trees: with straight trunks, well and characteristically branched for species.
- .5 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.
- .6 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
- .7 Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.
  - .1 During collection, ensure 10% maximum seed crop (or plants) are collected from healthy population of many individuals, and from several plants of same species.
  - .2 Leave remainder for natural dispersal and as food for dependent organisms.

### **2.2 WATER**

- .1 Free of impurities that would inhibit plant growth.

### **2.3 STAKES**

- .1 Wood, pointed one end, 38 x 38 x 2300mm.

**2.4 WIRE TIGHTENER**

- .1 Type 2: turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length.

**2.5 GUYING WIRE**

- .1 Type 2: 1.5 mm diameter multi-wire steel cable.

**2.6 CLAMPS**

- .1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.
- .2 Crimp type.

**2.7 ANCHORS**

- .1 Wood:
  - .1 Type 1: 38 x 38 x 460 mm.
- .2 Drive-in type:
  - .1 Type 1: 13 mm diameter x 75 mm long aluminum
- .3 Screw-in type:
  - .1 Type 1: 100 mm diameter steel disc.

**2.8 GUYING COLLAR**

- .1 Tube: plastic, 13 mm diameter, nylon reinforced.

**2.9 TRUNK PROTECTION**

- .1 Wire mesh: galvanized, electrically welded 1.4 mm wire with 25 x 25 mm mesh and fastener.
- .2 Plastic: perforated spiralled strip.
- .3 Burlap: clean 2.5 kg/m<sup>2</sup> minimum mass and 150 mm minimum wide, and twine fastener.
- .4 Tar impregnated crepe paper and twine fastener.

**2.10 MULCH**

- .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.

**2.11 FERTILIZER**

- .1 Synthetic commercial type as recommended by manufacturer and soil test report.
  - .1 Ensure new root growth is in contact with mycorrhiza.
  - .2 Use mycorrhiza as recommended by manufacturer's written recommendations.

**2.12 ANTI-DESICCANT**

- .1 Wax-like emulsion.

**2.13 FLAGGING TAPE**

- .1 Fluorescent

**2.14 SOURCE QUALITY CONTROL**

- .1 Obtain approval from Owner or Owners' Representative of plant material prior to planting.
- .2 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 Owners' Representative.
  - .2 Inform Owners' 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 Owners' Representative.

**3.2 PRE-PLANTING PREPARATION**

- .1 Proceed only after receipt of written acceptability of plant material from Owners' 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 acknowledgement 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 Owner or Owners' Representative prior to excavating.
  - .2 Excavate to depth and width as indicated.



- .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 Owner or Owners' 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.

### 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 two stakes tree support for deciduous trees greater than 3 m in height and evergreens greater than 2 m in height.
  - .1 Install as per detail
- .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 Owners' 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 Owners' 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. Make replacements in same manner as specified for original plantings.

### **3.9 MAINTENANCE DURING WARRANTY PERIOD**

- .1 From time of acceptance by Owners' 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 Owners' 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 Owner 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 VERIFICATION**

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification, include:
  - .1 Materials and resources.
  - .2 Storage and collection of recyclables.
  - .3 Construction waste management.
  - .4 Local/regional materials.

### **3.11 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling reuse in accordance with

### **3.12 CLOSEOUT ACTIVITIES**

- .1 Submit maintenance reports for trees, shrubs, and other plantings.

**END OF SECTION**