PROJECT TITLE LANDFILL CLOSURE WORKS, CSC COLLINS BAY INSTITUTION, LANDFILLS 1 & 3, KINGSTON, ONTARIO

ISSUED FOR TENDER

PROJECT NUMBER R.058456.001/002

PROJECT DATE 2014-07-25

END OF SECTION

Appendices

List of Drawings

END OF SECTION

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises of waste relocation and capping, located at Former Landfills 1 and 3 at CSC Frontenac Institution, and includes but is not limited to:

.1 Project preparations including:

.1 Utility locates.

.2 Improvements to existing haul road between Landfills 1 & 3 including sub-grade improvements, new granular base, new drainage ditches, construction of pull-over areas and installation of a culvert near Landfill 1.

.3 Coordination with local hydro company to request relocation of an existing hydro support pole and guy-wires at Landfill 1.

.4 Obtain permit for temporary site entrance off Front Road from City of Kingston.

.5 Decommissioning of existing monitoring wells at Landfills 1 and 3.

.6 Removal of trees over existing Landfills 1 and 3.

.7 Scarifying the existing Ground surface at Landfill 1.

.2 Temporary facilities including:

.1 Site access road and construction lay down areas.

.2 Construction trailer.

.3 Gate at temporary entrance off front road.

.4 Culvert installation beneath access road near Front Road.

.5 Fencing around Landfill 3.

.6 Erosion and Sediment Control Measures.

.3 Excavation of waste materials at Landfill 3 including:

.1 Maintaining a berm of existing material at the east and south extent of the excavation adjacent to existing wetlands and removing this berm at the final stage of excavation.

.2 Managing water in the excavation through dewatering and containment throughout.

.3 Facilitating collection of floor and wall samples by the Departmental Representative.

1.1 WORK COVERED BY CONTRACT DOCUMENTS (Cont'd)

.1 (Cont'd)

.3 (Cont'd)

.4 Transport of Landfill 3 wastes via the improved haul road for placement over Landfill 1.

.5 Supply, transportation and placement of limited fill and topsoil followed by hydroseeding in parts of the completed Landfill 3 excavation, and rehabilitation of remaining Landfill 3 area as additional wetland area.

.4 Landfill 1:

.1 Waste re-grading and compaction at Landfill 1.

.2 Supply and installation of a Geosynthetic Clay Liner (GCL) over the re-graded waste at Landfill 1 including construction of anchor trench.

.3 Supply, transportation and placement of topsoil cover above GCL, compacted and shaped to final grades.

.4 Re-grading and ditchwork around capped Landfill 1 to direct surface water run-off away from the cap.

.5 Hydro-seeding of final cap over Landfill.

.6 Restoration and hydro-seeding of any other disturbed areas.

.7 Planting of sapling replacement trees.

.8 Installation of fence around completed Landfill 1 with gate at haul road entrance.

1.2 CONTRACT METHOD

.1 Construct Work under combined price contract.

1.3 COST BREAKDOWN

.1 Within one week of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract price.

.2 Show separately cost of equipment purchased exempt from Ontario Retail Sales Tax under your Ontario Sales Tax licence number.

.3 Within 48 hours of bid acceptance submit a list of subcontractors.

1.4 WORK BY OTHERS

.1 Co-operate with Departmental Representative and their sub-consultants in carrying out their respective works and carry out instructions from Department Representative. Work of this Project must include provisions for coordinating related work, identified in Contract Documents, for following principal items.
.1 Collection of soil samples from floor and walls of completed excavation by Departmental Representative.
.2 Collection of water samples by Departmental Representative.
.3 Submit samples of all imported soil to Departmental Representative for analytical testing and approval.

.2 The Contractor shall for the purpose of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, and for the duration of the Work of the Contract:
.1 Assume the role of Constructor in accordance with the Authority Having Jurisdiction.

1.5 WORK SEQUENCE

.1 Install temporary access road and entrance on the north side of Front Road and approximately 200 m west of the east entrance to Landfill 1 prior to construction activities.

.2 Prepare work lay-down area at end of the temporary access road prior to start of construction activities to serve as staging area for delivery of materials and parking of equipment.

.3 Complete haul road improvements to existing road between Landfills 1 and 3 including preparation of two (2) vehicular pull-offs along the haul road between Landfills 1 and 3 to allow for vehicular passing during construction activities.

.4 Complete additional site preparations as required (tree removal, well decommissioning, utility pole relocating, etc.).

1.5 WORK SEQUENCE (Cont'd)

.5 Plan excavation and backfilling activities to accommodate 72 hour laboratory turnaround time for sample analysis following collection of waste and backfill samples.

.6 Complete waste excavation at Landfill 3 and waste placement at Landfill 1. Backfill as indicated at Landfill 3 and install landfill cover materials (including geosynthethic clay liner) at Landfill 1.

.7 Complete final grading, hydroseeding, fence installation, planting of new trees, restore all disturbed areas and complete final cleaning.

.8 Maintain fire access/control throughout.

1.6 CONTRACTOR USE OF PREMISES

.1 Contractor has use/access of site until Substantial Performance subject to operational and security requirements as directed by Departmental Representative.

.2 Contractor shall limit use of premises for Work, for storage, and for access, to allow;
.1 Work by other contractors.

1.7 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:
.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.

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 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Maintain existing services.

.3 Contractor will be responsible for providing temporary sanitary facilities.

.4 Closures: protect work temporarily until permanent enclosures are completed.

1.2 EXISTING SERVICES

.1 Notify, Departmental Representative and utility companies of any intended interruption of services and obtain required permission.

.2 Work should be completed to avoid all potential interruption of existing mechanical or electrical services at the CSC Institution facilities. If such interruptions are not avoidable, notify Departmental Representative at onset of project preparations (and at least 2 weeks prior to proposed interruption) so that appropriate notifications and arrangements can be made.

.3 Provide for vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 SPECIAL REQUIREMENTS

.1 Comply with Special Project Requirements in accordance with Section 01 35 13.

.2 Submit schedule in accordance with Section 01 32 16.

.3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.4 Keep within limits of work and avenues of ingress and egress.

1.3 SPECIAL REQUIREMENTS (Cont'd)

.5 Ingress and egress of Contractor vehicles at site is limited to work face.

1.4 SECURITY

.1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

.2 Security clearances:
.1 Personnel employed on this project will be subject to security check.
.2 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.
.3 In accordance with Section 01 35 13, Contractor's personnel will require satisfactory RCMP initiated security screening in order to complete Work on premises.

.3 Security escort:
.1 The work areas are entirely located in non-public areas and as such, an escort is required at all times when personnel are on-site.
.2 Submit an escort request to Departmental Representative at least 14 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by Departmental Representative. Cost incurred by late request will be Contractor's responsibility.
.3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 4 hours before scheduled time of escort. Cost incurred by late request will be Contractor's responsibility.
.4 Calculation of costs will be based on average hourly rate of security officer for minimum of 8 hours per day for late service request and of 4 hours for late cancellations.

1.5 SMOKING RESTRICTIONS

.1 In accordance with Section 01 35 13.

1.6 PROTECTION OF FARMERS'S CROPS

.1 The Contractor is not to interfere, damage, drive over, or in any other way impact any of the crops on the farmer's fields adjacent to the construction area without written permission of the CSC Institution Head.

.2 The Contractor may be held financially responsible for costs associated with damage to crops, if any crops are destroyed that have not been pre-approved by the CSC Institution Head.

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 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to Departmental Representative, meeting participants and affected parties not in attendance.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within 5 days after award of Contract, request and schedule a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

1.2 PRECONSTRUCTION MEETING (Cont'd)

.5 (Cont'd)

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with Section 01 32 16.

.3 Schedule of submission of shop drawings.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 and 01 56 00.

.5 Delivery schedule of specified equipment.

.6 Site security in accordance with Section 01 35 13.

.7 Health and safety in accordance with Section 01 35 28.

.8 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.9 Record drawings in accordance with Section 01 33 00.

.10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00.

.11 Monthly progress claims, administrative procedures, photographs, hold backs.

.12 Appointment of inspection and testing agencies or firms.

.13 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work and weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

.3 Notify parties minimum 3 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

1.3 PROGRESS MEETINGS (Cont'd)

.5 (Cont'd)

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for affect on construction schedule and on completion date.

.12 Health, safety and environmental incidents.

.12 Other business.

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 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive at a minimum, will provide a minimum five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission. Work on weekends may be completed, subject to approvals in accordance with 01 35 13 and approval from the Departmental Representative.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

1.1 DEFINITIONS (Cont'd)

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Construction work to be completed prior to November 15, 2014.

.4 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.5 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 and as directed.

.2 Submit to Departmental Representative within 7 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization and Site Setup.
.5 Haul Road Improvements.
.6 Excavation and Waste Relocation.
.7 Geosynthetic Clay Liner.
.8 Backfill.
.9 Site grading.
.10 Testing and Commissioning.
.11 Hydraulic Seeding.
.12 Site Restoration

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings as specified in Section 01 31 19, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule. A recovery plan by the Contractor may be required to address these activities behind schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

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 ADMINISTRATIVE

.1 Submit to Departmental 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 to Departmental 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 Departmental 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 Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.1 ADMINISTRATIVE (Cont'd)

.11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf, NMS-Edit Professional spp, MS Word, MS Excel, MS Project and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 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 Province of Ontario, Canada.

.3 Indicate materials, methods of construction, explanatory notes and other information necessary for completion of Work. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Amount. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, 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.

1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)

.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 Departmental Representative's review, distribute copies.

.10 Submit four hard copies and two electronic copies (on CD or flash drive) of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit four hard copies and two electronic copies (on CD or flash drive) of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit four hard copies and two electronic copies (on CD or flash drive) of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative

1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)

.12 (Cont'd)
.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.

.13 If upon review by Departmental 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.

.14 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that PWGSC 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.

1.3 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic and hard copy of colour digital photography in jpg format, fine resolution as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: at least 2 locations.
.1 Viewpoints and their location as determined by Departmental Representative.

1.3 PHOTOGRAPHIC DOCUMENTATION (Cont'd)

.4 Frequency of photographic documentation: weekly or as directed by Departmental Representative.
.1 Upon completion of: temporary access road, gate and lay down areas, tree removal, well hydro support pole relocation, installation of sediment and erosion control measures, haul road improvements and culvert installation, excavation at Landfill 3, waste placement and grading at Landfill 1, placement of geosynthetic clay liner and cover soil at Landfill 1, final grading of ditches, installation of fence around Landfill 1, final cleaning, and as directed by Departmental Representative.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

1.5 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and permits required.

.3 Furnish certificates and permits.

1.6 CONTRACTOR'S AS-BUILT DRAWINGS, SPECIFICATIONS

.1 As work progresses, neatly record significant deviations from the Contract drawings and specifications using fine, red marker on full size white prints and specifications. Make the same changes on the electronic files.

.2 Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but shall be neat and accurate. Add at each title block note: "AS BUILT". Also circle on List of Drawings each title and number of drawing marked with "AS-BUILT" information. Circle on Table of Contents each specification section number and title of specification sections marked with "AS-BUILT" information.

.3 Departmental Representative will provide one electronic set of drawings, schedules and specifications for as-built drawing and specification purposes.
.1 Drawings are in pdf format.

1.6 CONTRACTOR'S AS-BUILT DRAWINGS, SPECIFICATIONS (Cont'd)

.3 (Cont'd)

.2 Specifications are in NMS-Edit Professional.

.3 Amendments are in MS Word.

.4 Record following significant deviations:

.1 Depths of excavated waste materials.

.2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.

.3 Field changes of dimension.

.4 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.

.5 Turn one set, paper copy and electronic copy, of AS-BUILT drawings, specifications over to Departmental Representative on completion of work. Four additional hard copies and two additional electronic copies (on CD or flash drive) to be provided to Departmental Representative.

.6 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT". Four additional hard copies and two additional electronic copies (on CD or flash drive) to be provided to Departmental Representative.

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 PURPOSE

.1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.

.2 For additional information refer to Collins Bay Institution's "Contractor Health, Safety and Security Orientation."

1.2 DEFINITIONS

.1 "Contraband" means:

.1 An intoxicant, including alcoholic beverages, drugs and narcotics.

.2 Tobacco or associated tobacco products.

.3 An igniting device, lighter or matches.

.4 A weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization.

.5 An explosive or a bomb or a component thereof.

.6 Currency over any applicable prescribed limit, $50 when possessed by an inmate without prior authorization.

.7 Any item not described in paragraphs 1.2.1.1 to 1.2.1.6 that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.

.2 "Unauthorized Smoking and related Items" means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing tobacco, cigarette making machines, matches and lighters.

.3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.

.4 "CSC" means Correctional Service Canada.

.5 "Director" means Director, Warden or Superintendent of the Institution as applicable.

1.2 DEFINITIONS (Cont'd)

.6 "Construction Employees" means persons working for the General Contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.

.7 "Departmental Representative" means the onsite supervising consultant working on behalf of the project manager from Public Works and Government Services Canada.

.8 "Institutional Property" means the lands within the CSC Collins Bay Institution property.

.9 "Perimeter" means the fenced or walled area of the Institution that restrains the movement of the inmates.

.10 "Construction Limits" means the area as shown on the contract drawings that the Contractor will be allowed to work. This area is isolated from the security area of the Institution.

.11 "Construction Lay Down" means the temporary area within secondary fencing of CSC property that contains Contractor supplied office trailer, storage, portable washroom facility, machinery and equipment, and contractor parking.

1.3 PRELIMINARY PROCEEDINGS

.1 Prior to the commencement of work, the Contractor shall meet with the Director or his/her representative to:
.1 Discuss the nature and extent of all activities involved in the Project.
.2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.

.2 Contractor shall:
.1 Ensure that all Construction Employees are aware of the security requirements.
.2 Ensure that a copy of the security requirements is always prominently on display at the job site.
.3 Co-operate with institutional personnel in ensuring that security requirements are observed by all Construction Employees.

1.4 CONSTRUCTION EMPLOYEES

.1 Submit to the Director a list of the contractors and subcontractor companies working on the site and/or making deliveries to the site:
.1 Only authorized companies will be allowed on-site.
.2 Non-approved companies will be turned away.

.2 If access beyond the Construction Limits is required, submit to the Director a list of the names with date of birth of all Construction Employees to be entering the Perimeter and a security clearance form for each employee.
.1 Allow two (2) weeks for processing of security clearances. Employees will not be admitted to the Institution Perimeter area without a valid security clearance in place and recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC Institutions are not valid at this Institution.

.3 Clearances are not required for Construction Employees working within the Construction Limits.

.4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.

.5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
.1 Appear to be under the influence of alcohol, drugs or narcotics.
.2 Behave in an unusual or disorderly manner.
.3 Are in possession of contraband.

.6 Smoking is prohibited except in area designated by Director.

1.5 VEHICLES

.1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the owner or an employee of the company that owns the vehicle.

1.5 VEHICLES (Cont'd)

.2 The Director may limit at any time the number and type of vehicles allowed within the Institution.

.3 Drivers of delivery vehicles for material must remain with their vehicle the entire time that the vehicle is in the Institution. The Director may require that these vehicles be escorted by Institutional Staff or Commissionaires while on the Institutional Property.

.4 Vehicles and trailers permitted within the Construction Limits shall have doors locked at all times. All windows will be securely locked when left unoccupied. All storage trailers shall be locked when not in use.

1.6 PARKING

.1 Parking area to be used by Construction Employees will be limited to the Construction Laydown area. Parking in other locations at the Institution will be prohibited and vehicles may be subject to removal.

1.7 SHIPMENTS

.1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his/her own employees on site to receive any deliveries or shipments. CSC staff will NOT accept receipt of deliveries or shipments of any material, equipment or tools.

1.8 TELEPHONES

.1 There will be no installation of telephones, facsimile machines and computers with Internet connections permitted within the Institutional Property unless prior approval of the Director is received.

.2 The Director will ensure that approved telephones, facsimile machine and computers with internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an internet connection to unauthorized personnel.

1.8 TELEPHONES (Cont'd)

.3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, BlackBerries, telephone used as 2-way radios, are not permitted within the Institution perimeter but may be approved by the Director for use within the Construction limits. Forms must be submitted to the Director to request the use of all electronic devices capable of transmitting information (cell phones, computers, GPS, e-readers, etc.). The Director may limit the use of these devices.

.4 The Director may approve but limit the use of two way radios.

1.9 WORK HOURS

.1 Submit planned construction work hours to the Director for approval. Regular works shall be limited to a maximum 12 hour work day.

.2 Construction work hours will be limited by the City of Kingston Noise By-Laws.

.3 A typical work week will be a five day (Monday to Friday) week. A seven day work week may be permitted provided this is specified before the project starts with submission of the Project Schedule in Accordance with 01 32 16.

.4 Work will not be permitted during statutory holidays without the permission of the Director. A minimum of seven days' advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waived by the Director.

1.10 OVERTIME WORK

.1 No overtime work will be allowed without permission of the Director. Give a minimum forty-eight 48 hours advance notice when overtime work on the construction project is necessary and approved. If overtime work is required because of an emergency such as to make the construction safe and secure, the Contractor shall advise the Director as soon as this condition is known and follow the directions given by the Director. Costs to the Crown for such events may be attributed to the Contractor.

1.10 OVERTIME WORK (Cont'd)

.2 When overtime work or statutory holiday work is required and approved by the Director, extra staff members may be posted by the Director or his/her designate, to maintain the security surveillance. The Departmental Representative may post extra staff for inspection of construction activities. The actual cost of this extra staff may be subject to reclamation by the Crown.

1.11 TOOLS AND EQUIPMENT

.1 Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.

.2 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.

.3 Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.

.4 All missing or lost tools or equipment shall be reported immediately to the Director.

.5 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals:
.1 At the beginning and conclusion of every construction project.
.2 Weekly, when the construction project extends longer than a one week period.
.3 The Contractor may be subject to random checks by security staff to ensure proper storage and security of tools throughout the project.

1.12 KEYS

.1 Office and Trailer Keys:
.1 The Contractor will use standard construction cylinders for locks for his/her use during the construction period.
.2 The Contractor will issue instructions to his/her employees and sub-trades, as necessary, to ensure safe custody of the construction set of keys.

1.13 PRESCRIPTION DRUGS

.1 Employees of the Contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only Institutional Property.

1.14 SMOKING RESTRICTIONS

.1 Smoking is prohibited except in an area to be designated by the Director.

1.15 CONTRABAND

.1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on Institutional Property.

.2 Discovery of Contraband on the construction site and the identification of the person(s) responsible for the Contraband shall be reported immediately to the Director.

.3 Contractors shall be vigilant with both their staff and the staff of their sub-contractors and suppliers. The discovery of Contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.

.4 Presence of arms and ammunition in vehicles of Contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

1.16 SEARCHES

.1 All vehicles and persons entering Institutional property may be subject to search.

.2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of Contraband or unauthorized items, he/she may order that person to be searched.

.3 All employees entering the Institution may be subject to screening of personal effects for traces of Contraband drug residue

1.17 ACCESS TO AND REMOVAL FROM INSTITUTION PROPERTY

.1 Construction personnel and commercial vehicles will not be admitted to the Institutional Property after normal working hours, unless approved by the Director.

1.18 MOVEMENT OF VEHICLES

.1 Commercial vehicles will be allowed to enter or leave the Institution through the vehicle access gate established off Front Road when a Commissionaire working under the authority of the Director is present at the gate to authorize vehicle movement into and out of the area.

.2 The Contractor shall advise the Director twenty four (24) hours in advance to the arrival on the site of heavy equipment such as rock trucks, excavators, etc.

.3 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must remain within the Construction Limits. Outside of the Construction Limits, such vehicles would require continuous supervision by Commissionaires working under the authority of the Director.

.4 Commercial Vehicles will only be allowed access to Institutional Property when their contents are certified by the Contractor or his/her representative as being strictly necessary to the execution of the construction project.

.5 Vehicles shall be refused access to Institutional Property if, in the opinion of the Director, they contain any article which may jeopardize the security of the Institution.

.6 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed.

1.19 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY

.1 Subject to the requirements of good security, the Director will permit the Contractor and his/her employees as much freedom of action and movement as is possible.

1.19 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY (Cont'd)

.2 However, notwithstanding paragraph above, the Director may:

.1 Prohibit or restrict access to any part of the Institutional Property.

.2 Require that in certain areas of the Institutional Property, either during the entire construction project or at certain intervals, Construction Employees only be allowed access when accompanied by a member of the CSC security staff.

1.20 SURVEILLANCE AND INSPECTION

.1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.

.2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among Construction Employees and maintained throughout the construction project.

1.21 STOPPAGE OF WORK

.1 The Director may request at any time that the Contractor, his/her employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.

.2 The Contractor shall advise the Departmental Representative within 24 hours of this delay to the progress of the work.

1.22 COMPLETION OF CONSTRUCTION PROJECT

.1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction 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 REFERENCES

.1 Province of Ontario:
.1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
.2 Workplace Safety and Insurance Act, 1997.
.3 Municipal statutes and authorities.

.2 Health, Safety & Security Orientation for Contractor: Collins Bay and Frontenac Institution. December 2012.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Submit site-specific Health and Safety Plan, within 7 days after date of Notice to Proceed and at least 10 days prior to mobilization to site.

.3 Submit site-specific Health and Safety Plan, within 7 days after date of Notice to Proceed and at least 10 days prior to mobilization to site.

.4 Develop checklist for items to be inspected on a daily basis. Document actions taken.

.5 Personnel training requirements including:
.1 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.
.2 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.

.6 Personal protective equipment (PPE) program addressing:
.1 Donning and doffing procedures.
.2 PPE selection based upon site hazards.
.3 PPE use and limitations of equipment.

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.6 (Cont'd)

.4 Work mission duration, PPE maintenance and storage.

.5 PPE decontamination and disposal.

.6 PPE inspection procedures prior to, during and after use.

.7 Elevation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.

.8 Medical surveillance requirements for personnel assigned to work at site.

.9 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

.10 Site control measures employed at site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.

.11 Decontamination procedures for both personnel and equipment.

.12 Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.

.13 Written respiratory protection program for project activities.

.14 Procedures dealing with heat and/or cold stress.

.15 Spill containment program if drummed waste material is generated, excavated, stored, or managed on site.

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.7 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations

.8 Off-site Contingency and Emergency Response Plan:
.1 Prior to commencing Work involving handling of hazardous materials, develop off-site Contingency and Emergency Response Plan.
.2 Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from site.

.9 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 days after receipt of comments from Departmental Representative.

.10 The Health and Safety Plan shall include presentation of hazards and health and safety concerns to escorts, institutional staff or other workers that may be working in proximity to the construction areas.

1.3 REGULATORY REQUIREMENTS

.1 Comply with Acts and regulations of the Province of Ontario.

.2 Comply with specified standards and regulations to ensure safe operations at site.

.3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.

1.4 NOTICE OF FILING

.1 File Notice of Project with Provincial authorities prior to commencement of Work.

1.5 WORK PERMIT

.1 Obtain permits related to project prior to commencement of Work.

1.6 SITE CONDITIONS

.1 Work at site will involve contact with:

1.6 SITE CONDITIONS (Cont'd)

.1 (Cont'd)
.1 Construction and demolition waste in combination with waste soil and limestone in Landfill 1.
.2 Construction and demolition waste (including asbestos containing materials) and soil fill in Landfill 3.
.3 Potential wastes in both Landfills include:
.1 PCB containing materials.
.2 Free liquids.
.4 Wild parsnip is known to be present in the areas of Landfill 1 and Landfill 3. Wild parsnip poses a significant health risk as it can cause severe skin and eye irritation or burns from contact with the plant's sap.

.2 Traffic hazards at the site include:
.1 Traffic hazards from moving vehicles and equipment on-site.
.2 Traffic hazards from vehicle traffic on Front Road in vicinity of site access gate.

.3 Other site hazards include:
.1 Work in proximity to open water.
.2 Underground utilities.
.3 Potentially unstable soil conditions.
.4 Hot/cold weather conditions.
.5 Uneven ground and slip, trip and fall hazards.
.6 Hazards associated with heavy equipment operation.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Ensure Health and Safety guidelines provide for safe and minimal risk working environment for site personnel and minimize impact of activities involving contact with hazardous materials or hazardous wastes on general public and surrounding environment.

1.7 GENERAL REQUIREMENTS (Cont'd)

.3 Relief from or substitution for portion or provision of minimum Health and Safety Guidelines specified or reviewed site-specific Health and Safety Plan must submitted to Departmental Representative in writing. Departmental Representative will respond in writing, either accepting or requesting improvements.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

.3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act of Ontario.

1.9 HAZARD COMMUNICATION REQUIREMENTS

.1 Comply with Workplace Hazardous Materials Information System (WHMIS) Regulation, R.R.O. 1990, Regulation 860.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances.

.3 Provide Departmental Representative with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site.

1.10 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.10 WORK STOPPAGE (Cont'd)

.2 Assign responsibility and obligation to Health and Safety Officer where required to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

1.11 UNFORSEEN HAZARDS

.1 Should unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, stop work and immediately advise Departmental Representative verbally and in writing.

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the Act for the Province of Ontario.

1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.

.1 Contractor's Safety Policy.
.2 Contractor's Name.
.3 Notice of Project.
.4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
.5 Ministry of Labour Orders and reports.
.6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
.7 Address and phone number of nearest Ministry of Labour office.
.8 Material Safety Data Sheets.
.9 Written Emergency Response Plan.
.10 Site Specific Safety Plan.
.11 Valid certificate of first aider on duty.
.12 WSIB "In Case of Injury At Work" poster.
.13 Location of toilet and cleanup facilities.

1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

1.13 CORRECTION OF NON-COMPLIANCE (Cont'd)

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 HEALTH AND SAFETY OFFICER

.1 Employ and assign to Work competent and authorized representative as Health and Safety Adviser. Health and Safety Adviser must:
.1 Have minimum 2 years' site-related working experience specific to activities associated with construction of landfills, remediation projects or similar.
.2 Have basic working knowledge of specified occupational safety and health regulations.
.3 Be responsible for completing Health and Safety Training Session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work in Exclusion Zone or Contaminant Reduction Zone.
.4 Be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan.
.5 Be on site during execution of Work.
.6 Be available as required for emergency situations.

1.15 PERSONNEL HEALTH, SAFETY AND HYGIENE

.1 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

.2 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity. Minimum PPE required for each level of protection as follows:

.3 Level B:
.1 Respiratory: SCBA.
.2 Head, eye, Ear Protection: hard hat, goggles, safety glasses with sideshields and ear muffs or plugs.

1.15 PERSONNEL HEALTH, SAFETY AND HYGIENE (Cont'd)

.3 (Cont'd)
.3 Hand Protection: gloves, undergloves, overgloves.
.4 Foot Protection: safety shoes.
.5 Clothing: chemically resistant coverall.

.4 Level C/Modified Level C:
.1 Respiratory: full-face respirator.
.2 Head, Eye, Ear Protection: hard hat, goggles, safety glasses with sideshields, face shield, chemical goggles, ear muffs or plugs
.3 Hand Protection: gloves, undergloves, overgloves.
.4 Foot Protection: safety shoes.
.5 Clothing: chemically resistant coverall.

.5 Level D:
.1 Head, Eye, Ear Protection: hard hat, goggles, safety glasses with sideshields, chemical goggles and ear muffs or plugs.
.2 Clothing: standard work uniform.

.6 Anticipated levels of personal protection based on work activity are as follows:

Work Activity	**Anticipated Level of Personal Protection**
Waste Excavation/Placement/Compaction	Level C/D
Road Improvements/Backfilling/Grading/ Restoration	Level D

.7 Personal Protective Equipment:
.1 Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
.2 High visibility vest.
.3 Provide additional PPE (visibility vest, gloves, hard hat and safety glasses) for security escorts and CSC Institution staff.

.8 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
.1 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within work zones.

1.15 PERSONNEL HEALTH, SAFETY AND HYGIENE (Cont'd)

.8 (Cont'd)

.2 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.

.3 Dispose of or decontaminate PPE worn on site at end of each workday.

.4 Decontaminate reusable PPE before reissuing.

.5 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

.6 Ensure facial hair does not interfere with proper respirator fit.

.9 Respiratory Protection:

.1 Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.

.2 Develop, implement, and maintain respirator program.

.3 Monitor, evaluate, and provide respiratory protection for site personnel.

.4 Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified on site.

.5 In absence of additional air monitoring information or substance identification, minimum levels of respiratory protection develop action levels for measured sustained Total Organic Vapour or Dust concentrations which increase as follows:

.1 Half-facepiece air-purifying respirator, Level C.

.2 Full-facepiece air purifying respiratory, Level C.

.3 Shut down activities, evaluate the need for Level B or higher respiratory protection.

.6 Immediately notify Departmental Representative when level of respiratory protection required increases.

.7 Ensure appropriate respiratory protection during work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.

.8 Assess ability for site personnel to wear respiratory protection.

1.15 PERSONNEL HEALTH, SAFETY AND HYGIENE (Cont'd)

.9 (Cont'd)

.9 Ensure site personnel are able to pass respirator fit test prior to entering potentially contaminated work areas.

.10 Heat Stress/Cold Stress: implement heat stress and /or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.

.11 Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:

.1 Suitable containers for storage and disposal of used disposable PPE.

.2 Potable water and suitable sanitation facility.

.12 Emergency and First Air Equipment:

.1 Locate and maintain emergency and first-aid equipment in appropriate location on site including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.

.2 As minimum, provide 1 certified first-aid technician on site at all times when work activities are in progress.

.13 Site Communications:

.1 Post emergency numbers near site telephones.

.2 Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.

.3 Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.

.4 Furnish selected personnel with 2-way radio subject to approval in accordance with 01 35 13.

.5 Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

1.16 TRAFFIC CONTROL

.1 Traffic control personnel shall be trained watch-persons and flag-persons as per Section 69 (4) (d) of the Construction Regulation (O. Reg. 213/91) under the Occupational Health and Safety Act.

1.17 AIR MONITORING

.1 Air Monitoring Program:

.1 Develop air monitoring program meeting specified requirements.

.2 During progress of work activities, monitor air quality in and around work zones. Conduct monitoring on regular periodic basis, and additionally as required by special or work-related conditions. Report departures from general background to Departmental Representative who will, in conjunction with Health and Safety Officer, determine when operations should be shut down and restarted.

.3 Provide minimum required instruments for air monitoring as follows:

.1 Photoionization detector (PID).

.2 Personal particulate monitor.

.3 Combustible gas detector (CGS).

.4 Operate air monitoring equipment with personnel trained in equipment provided and under control of Health and Safety Officer.

.5 Conduct air monitoring on routine basis around active work locations. Perform hourly monitoring minimum and additionally as dictated by site activities.

.6 Furnish wind speed and direction indicator capable of providing permanent record, at unobstructed location on site located above elevation of work area with unobstructed view to affected workers.

.2 Air Monitoring Reporting: report air monitoring results daily to Departmental Representative on separate form.

1.18 CONTINGENCY AND EMERGENCY RESPONSE

.1 Meet specified requirements.

.2 Arrange and attend co-ordination meeting held with appropriate authorities including City, Fire, Hospital, Provincial and City Police, Ministry of Transportation, Ministry of Health, and Community Emergency Co-ordinator; meeting will identify off-site Emergency Response Co-ordinator through whom information and co-ordination will occur in event of incident.

1.19 SITE CONTROL

.1 Meet specified requirements.
.1 Open excavations to have restricted access to prevent unauthorized entry.
.2 Construction laydown pad to have temporary fencing or similar as required by the Departmental Representative.
.3 Temporary construction gate to be installed to prevent unauthorized access as required by the Departmental Representative.
.4 Signage to be provided at all work areas.

.2 Prior to commencing work involving handling of drums and other containers, submit procedures for safe handling of drums and other containers. Implement and enforce drum handling program during activities involving drummed waste characterization including but not limited to handling, opening, sampling, staging, and consolidating.

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 31 11 00 - Clearing and Grubbing.

.2 Section 32 93 10 - Trees, Shrubs and Ground Cover Planting.

1.2 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

.3 Sustainable Remediation: the application of technologies and approaches that enhance a project's environmental, social, and economic footprints, as defined by the California Department of Toxic Substances Control

1.3 REFERENCES

.1 Canadian and Ontario Environmental protection Acts and pursuant regulations including but not limited to:

.1 Canadian Environmental Assessment Act (1999) and pursuant regulations.

.2 Transportation of Dangerous Goods Act and pursuant regulations

.3 Environment Canada's "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" available at http://www.ec.gc.ca/cppic/En/refView.cfm?refl=1863.

.4 Canadian Council of Ministers of the Environment (CCME) Documentation, including but not limited to:

.1 Canadian Environmental Quality Guidelines.

.5 Revised Regulations of Ontario 1990, Regulation 347 "General-Waste Management".

.6 Ontario Water Resources Act and pursuant regulations, policies and guidelines including but not limited to:

1.3 REFERENCES (Cont'd)

.1 (Cont'd)

.6 (Cont'd)

.1 Revised Regulations of Ontario 1990, Regulation 903 "Wells".

.2 Provincial Water Quality Objectives, July 1994.

.7 Ontario Provincial Standard Specifications (OPSS) including but not limited to:

.1 OPSS 805 - Construction Specification for Temporary Erosion and Sediment Control Measures.

.8 Department of Fisheries and Oceans (DFO) "Measures to Avoid Causing Harm to Fish and Fish Habitat" available at http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng html.

.9 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197).

.2 Environmental Effects Evaluation (EEE) Report, Site Closure of Former Landfills 1 and 3, Collins Bay Institution, 1455 Bath Road, PO Box 7500, Kingston, Ontario. Prepared by Public Works and Government Services Canada - June 3, 2014.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit 2 copies of WHMIS MSDS.

.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues, including Sustainable Remediation, which must be addressed during construction.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

.5 Environmental Protection Plan must include mitigation measures specified in Environmental Effects Evaluation (EEE) Report prepared by Public Works and Government Services Canada for the project.

1.4 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.6 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.7 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations. Measures to avoid causing harm to fish and fish habitat must meet the requirements of Department of Fisheries and Oceans (DFO) for working near water, where applicable (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html).

.6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

.1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

1.4 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.7 (Cont'd)

.8 (Cont'd)

.9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water, dewatering of ground water, etc.

.14 Sustainable Remediation Plan: to the extent practicable, explore and implement realistic sustainable remediation strategies and applications in the performance of the requirements of this work assignment to maximize sustainability, including Energy, Water, Air & Atmosphere, Materials & Waste, and Land & Ecosystems:

.1 Energy management strategies to increase energy efficiency and use of renewable energy.

.2 Water management strategies to reduce water consumption, reuse treated water, and use efficient techniques to manage and protect surface water and groundwater.

.3 Air emission strategies to decrease emissions of harmful air pollutants from treatment processes, operation of heavy machinery, and transportation of vehicles.

.4 Solid and liquid waste management strategies to reduce Contractor and project materials consumption and waste generation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.7 (Cont'd)

.14 (Cont'd)

.5 Land and ecosystems management strategies to protect ecosystems during site cleanup.

1.5 FIRES

.1 Fires and burning of rubbish on site is not permitted.

1.6 DISPOSAL OF WASTE

.1 With the exception of excavated wastes from Landfill 3 to be transported and buried at Landfill 1 and selected other materials as directed by Departmental Representative, do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner onto the ground or into waterways, storm or sanitary sewers.

.3 Do not discharge wastes into streams or water ways.

.4 Separate and dispose of accumulated waste materials off-site in accordance with R.R.O. 1990, Reg. 347 General Waste Management, to MOE approved disposal facilities or approved transfer stations, including, but not limited to, the following:

.1 Debris including excess construction material.

.2 Non-contaminated litter and rubbish.

.3 Disposable PPE worn during final cleaning as applicable for contaminant.

.4 Wastewater removed from wastewater storage tank.

.5 Wastewater generated from final decontamination operations including wastewater storage tank cleaning.

.6 Lumber from decontamination pads.

1.6 DISPOSAL OF WASTE (Cont'd)

.5 Appropriate procedures shall be implemented for handling of excavated wastes and impacted soils during all phases of the project. Non-hazardous excavated wastes from Landfill 3 shall be relocated to Landfill 1. Should hazardous wastes be identified, off-site disposal will be by licensed haulers to a MOE-approved disposal facility. Refer to Land Disposal Restrictions in O.Reg. 347 - General Waste Disposal under Ontario EPA and MOE Fact Sheet "Summary of Land Disposal Restrictions, Treatment and Notification Requirements for Waste Generators".

.6 Disposal/recycling of other waste generated during the project shall be done in compliance with Ontario Waste Regulations and the facilities used will be approved by the Departmental Representative.

1.7 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access and haul roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and place into designated area approved by Departmental Representative. Clean access and haul roads at least once per shift.

.2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

.2 Vehicles/equipment shall be in good working order and not be leaking any fuel or fluids.

.3 Restrict access of vehicles from creek banks to protect slope stability.

.4 During construction designated fuelling area(s) will be established. Fuel stored on site must be stored in compliance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197).

1.7 VEHICULAR ACCESS AND PARKING (Cont'd)

.5 Refuelling of vehicles and equipment shall not be conducted within 30 m of watercourses.

.6 Traffic management measures (such as `Traffic Control Person') shall be implemented if required at site access points to direct traffic.

1.8 EQUIPMENT DECONTAMINATION

.1 Commence Work involving equipment contact with potentially contaminated material only after Equipment Decontamination Pads are operational.

.2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.

.3 Perform equipment decontamination on Contractor-constructed equipment decontamination pad to prevent cross contaminating unimpacted areas.

.4 Equipment Decontamination Pads to include pad, potable wash water system, and a lined, dyked containment area with a water collection sump. Equipment decontamination pads shall be removed prior to conclusion of the project.

.5 At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by Departmental Representative. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in Clean Zone before removing from site or travelling on clean areas. Perform assessment as directed by Departmental Representative to determine effectiveness of decontamination.

1.8 EQUIPMENT DECONTAMINATION (Cont'd)

.6 Each piece of equipment will be inspected by Departmental Representative after decontamination and prior to removal from site and/or travel on clean areas. Departmental Representative will have right to require additional decontamination to be completed if deemed necessary.

.7 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

.8 Collect decontamination wastewaters and sediments which accumulate on equipment decontamination pad. Transfer wastewaters to designated wastewater storage tank.

.9 Transfer sediments to a designated area approved by the Departmental Representative.

.10 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

.11 Provide sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.9 DRAINAGE

.1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005.

1.9 DRAINAGE (Cont'd)

.2 Provide temporary drainage and pumping required to keep working face of excavations free from water. Potentially impacted water within the excavation footprint (i.e. groundwater or rain water in direct contact with excavation footprint) will be pumped to wastewater storage tanks for testing by Departmental Representative.

.3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

.5 Do not direct water flow in a manner which would cause erosion to existing areas.

1.10 SURFACE WATER AND GROUNDWATER QUALITY

.1 Materials and equipment shall be operated and stored in a manner that prevents deleterious substances (e.g., petroleum products, silt, etc.) as defined by the Fisheries Act from entering surface water.

.2 Groundwater entering excavations shall be collected and tested to determine if impacted by contaminants. Impacted groundwater shall be disposed of at an MOE-licensed facility as waste classification code 263L (misc organic waste) or 149L (landfill leachate). Whether groundwater is impacted and the appropriate waste classification code will be determined through testing completed by Departmental Representative.

.3 The excavation work should be staged so that a land plug or berm of existing material is left as an isolation measure between the waters of Little Cataraqui Creek and the first stage of excavation area.

1.10 SURFACE WATER AND GROUNDWATER QUALITY (Cont'd)

.3 (Cont'd)

.1 If the isolated excavated area has to be de watered, water being pumped from the excavation should be tested by Departmental Representative. If determined suitable for discharge, when discharged, water should be diverted away from the creek to a vegetated area and/or through additional filtering structures to ensure removal of suspended sediment. Discharge water entering the creek should be free of silt or other deleterious materials.

.2 The isolation measures at the waters' edge should be left in place until the land plug is excavated and the exposed areas stabilized.

.3 If isolation measures are non-permeable (e.g. silt/clay), care should be taken to ensure water levels on the freshly excavated side are equal to those of Little Cataraqui Creek prior to removal.

1.11 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated. Refer to 31 11 00 for additional information.

.2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and surround with protective wood framework from grade level to height of 2 m minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

.6 Minimize clearing of vegetation to only those areas necessary for construction and operation.

.7 Minimize the removal of terrestrial habitat to the extent possible during clearing.

.8 All trees planned for removal must be removed by a certified tree removal company.

1.11 SITE CLEARING AND PLANT PROTECTION (Cont'd)

.9 Trees removed, that are greater than 25 cm in diameter at breast height, will be replaced following a policy of 'for every tree removed two are planted.' Compensation planting shall consist of planting of saplings at locations as instructed by the Departmental Representative. Refer to 32 93 10 for additional information.

.1 Trees removed with an identified diameter of greater than 25 cm and less than 50cm shall be replaced with a mixture of native non-invasive deciduous tree saplings with a minimum height of 80cm and native non invasive deciduous shrubs with a minimum height of 45 cm.

.2 Trees removed with an identified diameter of 50 cm or more shall be replaced with non-invasive deciduous tree saplings that are a minimum of 150 cm tall and with a minimum caliper of 15 mm.

1.12 VEGETATION

.1 Protect vegetation that does not have to be removed by fencing/delineating construction working and/or storage areas.

.2 Operate construction machinery in a manner that minimizes damage to adjacent vegetation.

1.13 FARMER'S CROPS

.1 Protect all agricultural crops on lands adjacent to constructions areas from damage.

.2 Ensure sediment and erosion control measures to protect run-off from constructions areas from affecting the crop lands.

.3 Ensure any discharging of water to land is directed away from the crops.

1.14 WORK ADJACENT TO WATERWAYS

.1 Maintain adequate separation distances between equipment and watercourses or wetlands.

.2 Minimize operational footprint as much as practical or change location of temporary workspaces. Parking areas and laydown areas are not to be located within 10 metres of high water mark of wetlands or watercourses.

1.14 WORK ADJACENT TO WATERWAYS (Cont'd)

.3 Waterways to be kept free of excavated fill, waste material and debris. Work must be scheduled to avoid periods of heavy precipitation and haul road.

.4 Do not use water from waterways.

.5 Special care shall be exercised while working near water's edge and in the riparian zone, including site-specific erosion and sediment control measures. Silt control measures shall be used to minimize sediment transport.

.6 Limit access to watercourses by site personnel.

.7 Equipment shall remain on land at all times. Removal of debris at water's edge shall be executed with minimal disturbance to shoreline and watercourse.

.8 Follow site-specific timing restrictions (work windows).

1.15 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Ensure hazardous substances (including fuel) are stored, handled and applied in a manner to prevent release to the environment and in a manner in accordance with applicable regulations including hazardous waste regulations.

.5 Secure all materials when not in use and at non-productive times (night and shut-down).

.6 Vehicles shall be shut off when not in use. No vehicle idling on-site.

.7 Store hazardous or toxic substances in a designated area as approved by a Departmental Representative.

1.15 POLLUTION CONTROL (Cont'd)

.8 Comply with requirements of WHMIS regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of MSDS acceptable to Labour Canada.

.9 Regularly inspect work area and surrounding lands to collect wind-blown litter. During placement and compaction of wastes at Landfill 1, limit the working face at any given time to a small and distinct area to allow better control of potential litter dispersal.

1.16 SPILLS OR RELEASE OF DELETERIOUS SUBSTANCES

.1 Immediately contain, limit spread and clean up in accordance with federal and provincial regulatory requirements.

.2 All workers shall be fully aware of the spill prevention and response procedures including notification of Departmental Representative.

.3 The Ontario Ministry of Environment Spills Action Centre must be notified immediately by law at 1-800-268-6060.

.4 The Departmental Representative shall be immediately informed of all spills that occur onsite. The contractor will be required to contact the Control or Security Liaison Officer and the Chief of Facility Management at the institution in the event of any spill. An Environmental Incident Report (CSC Form 1265-03) will also be completed by the contractor and submitted to the Chief of Facility Management.

.5 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

.6 Supply appropriate Spill kits and keep them on-site close to the high risk areas during all project phases.

1.16 SPILLS OR RELEASE OF DELETERIOUS SUBSTANCES (Cont'd)

.7 Contractor shall take due care to ensure no deleterious materials including sediment-laden runoff leave the worksite, or enter any surface water, storm water, or sanitary sewers at or near the worksite.

.8 Equipment fuelling or lubricating shall occur in a designated area with proper controls to prevent the release of deleterious substances, and shall be conducted away from any surface water drains or collection points. Petroleum spill clean-up equipment shall be available on-site.

.9 In accordance with the Fisheries Act, approval must be obtained from EC who administers the pollution prevention sections for use of any paints, corrosion protective coatings, wood preservatives or any other hazardous material that will be applied to surfaces that will have contact with the marine environment. Ensure Material Safety Data Sheets (MSDS) are kept on site for all hazardous materials.

.10 Any equipment remaining on site overnight shall have appropriately placed drip pans.

.11 The rinse water, cleaning water, solvents for glues, wood preservatives and other potentially harmful or toxic substances should be controlled so as to prevent leakage, loss or discharge into any surface water including the storm drain system, and from entering groundwater.

.12 Protect the roadways from tracking of mud, soil, and debris throughout the work.

1.17 NOISE CONTROL

.1 All construction equipment shall be operated with exhaust systems in good repair to minimize noise.

.2 Construction activities that could create excessive noise shall be restricted to daylight hours and adhere to the municipal noise by-law.

1.17 NOISE CONTROL (Cont'd)

.3 If work is to be undertaken outside the specified period in the local noise by-law, then approval for an exemption to the by-law shall be obtained by the Contractor from the municipality.

.4 Ensure that noise control devices (i.e. mufflers, silencers) on construction equipment are properly maintained.

1.18 HISTORICAL/ ARCHAEOLOGICAL CONTROL

.1 Provide an historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during site work.

.2 Prepare methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

.3 If archaeological deposits are discovered during the project work shall stop immediately and the Departmental Representative shall immediately be notified.

.4 Archaeologically significant material, if found on the property, remains the property of the Crown and shall not be removed from the site.

.5 Management of the archaeological materials will be coordinated through Departmental Representative.

1.19 NOTIFICATION OF NON-COMPLIANCE

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

1.19 NOTIFICATION OF NON-COMPLIANCE (Cont'd)

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.20 SPECIES AT RISK

.1 Should a species at risk or its critical habitat be encountered, measures are to be implemented to avoid destruction, injury or interference with the species, its residence and/or its habitat (e.g., through siting, timing or design changes). If the foregoing cannot be avoided Contractor should cease work and contact Departmental Representative for advice regarding mitigation measures.

.2 In the event that it is determined that the project is likely to have unexpected adverse effects on species at risk (SAR), all work shall immediately cease and the Contractor shall notify the Departmental Representative immediately.

.3 Mammals: Grey Fox.

.4 Bird flyways: Common Nighthawk, Black Tern, Red-Shouldered Hawk, Short-Eared Owl, Least Bittern.

.5 Reptiles and amphibians: Snapping Turtle, Blanding's Turtle, Spiny Softshell, Northern Map Turtle, Milksnake.

.6 Fish habitat: American Eel (under consideration for SAR ranking).

.7 Invertebrates: Monarch Butterfly.

.8 Vegetation: None.

1.20 SPECIES AT RISK (Cont'd)

.9 The SAR species listed above have the potential to be present at or near the work areas. A SAR awareness package will be developed by the Departmental Representative's and made available for contractor education. Mitigation measures for avoidance will be specified. Photographs of potential SAR species will be provided during an initial orientation, and remain available on-site to assist in identification and related mitigation measures.

1.21 MIGRATORY BIRDS /WILDLIFE HABITAT

.1 Disturbance and destruction of habitat should be timed outside of breeding season of mid-April to end of July.

.2 Ensure all works are in compliance with the Migratory Birds Convention Act.

.3 Restrict vehicle movements to construction areas and access roads and avoid harassment of animals.

1.22 FISH/ FISH HABITAT

.1 All materials and equipment used will be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) as defined by the Fisheries Act from entering any surface water including storm drains.

.2 Unless specifically authorized by DFO under the authority of the Fisheries Act, no work or undertaking shall result in harmful alteration, disruption or destruction of fish habitat.

1.23 SUSTAINABLE REMEDIATION

.1 Energy:

.1 Select suitably sized power machinery and equipment that operate using clean alternative fuels, are energy efficient or hybrid, and maintain equipment at peak performance to maximize efficiency.

.2 Operate equipment at low-usage times and reduce electricity use during peak hours.

.3 Purchase materials from suppliers of locally produced products and select local providers for field operations.

1.23 SUSTAINABLE REMEDIATION (Cont'd)

.1 (Cont'd)

.4 Coordinate outside services and service providers to minimize transport of equipment.

.5 Employ auxiliary power units to power cab heating and air conditioning when a machine is unengaged.

.6 Evaluate and optimize energy efficiency of equipment with high energy demands periodically and adjust operations accordingly.

.7 Control nuisance odours associated with diesel emissions from construction equipment.

.8 Maintain engines to meet original standards and train operators to run equipment efficiently.

.2 Water:

.1 Minimize fresh water and potable water consumption and maximize use of non-potable water and water reuse during daily operations and treatment processes.

.2 Prevent nutrient loading in nearby water bodies.

.3 Minimize runoff using open-space preservation methods such as reduced pavement widths, and shared transportation access.

.3 Air Emissions:

.1 Reduce atmospheric release of toxic or priority pollutants and minimize dust export of contaminants.

.2 Consolidate onsite and offsite vehicular trips to reduce fuel consumption.

.3 Secure and cover loose, excavated material in open trucks with reusable covers.

.4 Revegetate excavated areas as quickly as possible.

.5 Limit onsite vehicle speeds to 15 kilometres per hour.

.6 Retrofit machinery and heavy equipment for diesel-engine emission control and exhaust treatment technologies such as particulate filters and oxidation catalysts.

.7 Maintain engines of vehicles and machinery in accordance with manufacturer recommendations.

.8 Modify field operations through combined activity schedules, an idle reduction plan, and using machinery with automatic idle-shutdown devices.

1.23 SUSTAINABLE REMEDIATION (Cont'd)

.4 Waste:
.1 Minimize waste generation and re-use materials whenever possible.
.2 Minimize natural resource extraction and disposal.
.3 Select the closest appropriate waste receiver.
.4 Use products with recycled and bio-based content and recycling potential.

.5 Land & Ecosystems:
.1 Establish efficient traffic patterns to minimize soil compaction in work areas.
.2 Install appropriate sediment and erosion control measures to capture sediment runoff along slopes.
.3 Ensure all equipment is clean prior to arrival on site to minimize potential of transporting invasive species.
.4 Minimize soil and habitat disturbance and reduce noise and lighting disturbance.
.5 Except in the cover materials at Landfill 1, prevent topsoil compaction and increase subsurface water infiltration wherever topsoil is placed.
.6 Construct berms to divert stormwater to sediment ponds, other sediment control structures, or away from the construction site to minimize the volume of water that requires handling.
.7 Revegetate (i.e. Hydroseed where appropriate) disturbed area and cover with native seed to foster rapid plant growth.
.8 Ensure all materials brought on site are free of non-native and invasive species.
.9 Provide uncompacted soil that is conducive to plant growth.
.10 At the end of the project work, thoroughly clean the project area of debris, dirt, and trash using non-phosphate, non-toxic, plant-based, and biodegradable cleaners and detergents.
.11 Use environmentally friendly lubricants for engine maintenance.
.12 Place decontamination station away from environmentally sensitive areas.
.13 Use secondary containment to control spills or leakage.

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 REFERENCES AND CODES

.1 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
.3 Environmental Protection Act, O. Reg. 102/94, O. Reg. 103/94, and O. Reg. 903/90.
.4 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.
.5 Canadian Environmental Assessment Act.
.6 Canadian Environmental Protection Act (New Substance Notification Regulations).
.7 Transportation of Dangerous Goods Act.
.8 Fisheries Act.
.9 Migratory Birds Convention Act.
.10 Migratory Birds Regulations.

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Manage asbestos materials encountered during excavation work at Landfill 3 in accordance with Section 31 23 33.01.

.2 Stop work immediately and notify Departmental Representative if other designated substances, toxic and/or hazardous waste are discovered during excavation at Landfill 3.

1.3 SMOKING ENVIRONMENT

.1 Comply with smoking restrictions in accordance with Section 01 35 13.

1.4 RELICS AND ANTIQUITIES

.1 Relics and antiquities, and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tables, and similar objects found on site shall remain the property of CSC. Protect such articles and request directives from Departmental Representative.

.2 Should historic objects be uncovered during excavating, stop work immediately and notify the Departmental Representative. Do not resume work until directed to by the Departmental Representative.

1.5 STATISTICAL INFORMATION

.1 Provide statistical information to Departmental Representative:
.1 Within ten working days after March 31 and September 30 occurring between commencement of work and final completion.
.2 Within ten working days after final completion.

.2 Include in statistical information:
.1 Statement of total person days of labour used on site in performance of contract, including labour provided under sub-contracts.
.2 Estimate of total value in dollars of material delivered to site and installed, including material provided and installed under sub-contracts.

.3 This information is required by Government of Canada solely to provide statistics that will aid in assessing socio-economic benefits of this project.

1.6 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

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 31 23 33.01 - Excavating and Backfilling.

.2 Section 01 35 43 - Environmental Procedures.

1.2 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by Departmental Representative. Cost of such equipment will be borne by Contractor.

1.3 INDEPENDENT INSPECTION AGENCIES (Cont'd)

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site.

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.6 REJECTED WORK (Cont'd)

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.7 REPORTS

.1 Submit copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested.

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 MEASUREMENT PROCEDURES

.1 Dewatering in the excavation at landfill 3 shall be measured under Section 31 23 33.01.

.2 All other temporary utilities shall be measured as part of the lump sum and will not be measured separately for payment.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.3 DEWATERING

.1 Provide temporary drainage and pumping required to keep excavations free from water. Potentially impacted water within the excavation footprint (i.e. groundwater or rain water in direct contact with excavation footprint) will be pumped to wastewater storage tanks for testing by Departmental Representative.

1.4 WATER SUPPLY

.1 Contractor will provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal or truck in potable water as required.

1.5 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to power supply required for the safe and timely completion of construction

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment as required for own use and use of Departmental Representative.

1.7 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

1.8 RE-LOCATION OF UTILITIES

.1 Make arrangements with responsible utility company to have a hydro support pole and guy wires currently located in the Landfill 1 footprint relocated to an area outside the construction area footprint.

.2 Coordination of relocation of utilities must be initiated as soon as possible to ensure no impact of the overall project schedule.

1.9 TEMPORARY CULVERT

.1 Install culvert pipe to allow storm water drainage at temporary access road in accordance with Section 33 42 13.

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 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

.5 Temporary Access Road and Construction Lay Down Areas.

1.2 MEASUREMENT PROCEDURES

.1 Construction facilities shall be measured as part of the lump sum and will not be measured separately for payment.

1.3 REFERENCES

.1 Canadian Standards Association (CSA International)
.1 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment, withdrawn but still available from CSA, CCOHS and Techstreet.

.2 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS 805 - Nov. 2010 - Construction specification for Temporary Erosion and Sediment Control Measures.

.3 Province of Ontario:
.1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.

1.4 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of any fence installation.

.2 Identify areas for temporary access road and gate, construction lay down, vehicle parking, equipment decontamination pad and topsoil storage.

.3 Identify additional areas which have to be gravelled to prevent tracking of mud.

1.4 INSTALLATION AND REMOVAL (Cont'd)

.4 Indicate use of supplemental or other staging area.

.5 Provide construction facilities in order to execute work expeditiously.

.6 Remove from site all such work after use.

1.5 SITE STORAGE/ LOADING

.1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.6 ACCESS ROAD AND CONSTRUCTION LAY DOWN AREAS

.1 Build and maintain temporary access road and construction lay down areas and provide snow removal and dust control during period of work.

.2 Contractor is responsible for maintaining the access road for the duration of the project.

.3 Keep access road in condition suitable for use by Contractor vehicles and equipment, and in condition suitable for use of personal vehicles for security escorts, CSC Institution staff and Departmental Representative.

1.7 CONSTRUCTION PARKING

.1 Parking will be permitted on site if approved by Departmental Representative and provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Build and maintain temporary roads where directed by Departmental Representative and provide snow removal and dust control during period of Work.

1.7 CONSTRUCTION PARKING (Cont'd)

.4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.5 Clean construction runways and taxi areas where used by Contractor's equipment.

1.8 OFFICES

.1 Provide office heated to 22°C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

.4 Contractor's Site office:
.1 Provide temporary office for Departmental Representative.
.2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 50% opening windows and one lockable door.
.3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
.4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.
.5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10 % upward light component.
.6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
.7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
.8 Maintain in clean condition.

1.8 OFFICES (Cont'd)

.5 Offices shall be locked at all times when not occupied.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.10 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.11 CONSTRUCTION SIGNAGE

.1 No other signs or advertisements, other than warning signs, are permitted on site.

.2 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN/CSA-Z321.

.3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC (Cont'd)

.4 Traffic control personnel shall be trained watch persons and flag-persons as per Section 69 (4) (d) of the Construction Regulation (O. Reg. 213/91) under the Occupational Health and Safety Act.

.5 Protect travelling public (vehicles, bicycles and pedestrians) from damage to person and property.

.6 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.7 Once improvements to existing haul road are completed, maintain haul road for the duration of the project. Contractor responsible for repair of damage to all existing roads caused by construction operations.

.8 Construct access roads necessary.

.9 Access roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. Where required, construct temporary pull over areas in order to allow for the safe passing of heavy equipment.

.10 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.11 Dust control: adequate to ensure safe operation at all times.

.12 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, access roads designated by Departmental Representative.

1.13 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways daily.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

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 requirements of authorities having jurisdiction, sediment and erosion control plan, specific to site, that complies with OPSS 805.

.2 Inspect, repair, and maintain erosion and sedimentation control measures throughout construction and warranty until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 52 00 - Construction Facilities.

1.3 MEASUREMENT PROCEDURES

.1 Temporary snow fencing shall be measured in metres erected.

.2 Silt fencing shall be measured in metres.

.3 All remaining temporary barriers (including temporary site access entrance gate) shall be measured as part of the lump sum and will not be measured separately for payment.

1.4 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.5 HOARDING

.1 Erect temporary enclosure around Landfill 3 using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m o.c. Maintain fence in good repair.

.2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

.3 Erect temporary site entrance to temporary access road using lockable gate spliced into existing fence. Equip gate with lock and keys. Maintain fence in good repair and remove at end of project.

.4 Erect silt fencing around temporary access road and lay down areas west of Landfill 1 to protect adjacent farmer's crops from runoff associated with construction areas.

1.5 HOARDING (Cont'd)

.5 Erect additional barriers (e.g. snow fencing and silt fencing) as deemed necessary by the Departmental Representative to prevent workers and equipment from impacting farmer's crops in vicinity of construction work areas.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads and construction runways as may be required for access to Work.

1.7 FIRE ROUTES

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

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 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.2 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 generated from project work from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only remove from site.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris generated through project work.

.5 Provide on-site containers for collection of waste materials and debris generated through project work.

.6 Remove waste material and debris generated through project work from site and deposit in waste container at end of each working day.

.7 Dispose of waste materials and debris generated through project work off site.

1.3 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.

1.3 FINAL CLEANING (Cont'd)

.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 Departmental 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

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 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
.1 Work has been completed and inspected for compliance with Contract Documents.
.2 Defects have been corrected and deficiencies have been completed.
.3 Work is complete and ready for final inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Final Payment: When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

1.1 INSPECTION AND DECLARATION (Cont'd)

.7 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.
.1 Remove waste and surplus materials, rubbish and construction facilities from the site.

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 SUBMISSION

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

1.2 FORMAT

.1 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.2 Provide 1:1 scaled CAD files in dxf dwg format. Forward pdf and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.3 AS-BUILTS AND SAMPLES

.1 Maintain at the site for Departmental Representative one record copy of:
.1 Contract Drawings.
.2 Specifications
.3 Amendments and addenda.
.4 Change Orders and other modifications to the Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.

.2 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents and samples available for inspection by Departmental Representative.

.5 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work. Submit files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.3 AS-BUILTS AND SAMPLES (Cont'd)

.6 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, provided by Departmental Representative.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.2 Field changes of dimension and detail.
.3 Changes made by change orders.
.4 Details not on original Contract Drawings.
.5 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Amendments and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.5 FINAL SURVEY

.1 Submit final site survey certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

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 SECTION INCLUDES

.1 This section defines the procedures for handling of toxic and/or hazardous wastes throughout the project works including:
.1 Impacted groundwater from excavation dewatering activities if sampling by Departmental Representative suggests water is not suitable for discharge.
.2 Toxic waste (other than asbestos) encountered during excavation activities.
.3 Other toxic wastes associated with miscellaneous Contractor work activities.

.2 This section does not apply to asbestos materials encountered during excavation work at Landfill 3. Manage asbestos materials in accordance with Section 31 23 33.01.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 33.01 - Excavating and Backfilling.

1.3 MEASUREMENT PROCEDURES

.1 Handling and disposal of asbestos waste shall be included in the unit rates for excavation, loading, transport and waste placement in accordance with Section 31 23 33.01.

.2 The handling, transport and disposal of solid toxic waste encountered during excavation will be measured by actual weight (per tonne) if encountered.
.1 Toxic waste is not anticipated to be encountered during excavation.

.3 The handling, transport and disposal of liquid toxic waste originating from dewatering of excavation (impacted groundwater) will be measured by volume (in Litres) removed from site.

.4 Handling, transport and disposal for other toxic wastes associated with miscellaneous Contractor work activities (e.g. surplus materials and cleaning residues) shall be included in the lump sum and will not be measured separately for payment.

1.4 REFERENCES

.1 Canadian Environmental Protection Act,1999 (CEPA 1999).

1.4 REFERENCES (Cont'd)

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.3 National Fire Code of Canada, 2012.

.4 Transportation of Dangerous Goods Act (TDGA), 1999 c. 34.

.5 Transportation of Dangerous Goods Regulations (TDGR), T-19.01-SOR/2003-400.

.6 Storage of PCB Material Regulations, SOR/92-507.

.7 PCB Waste Export Regulations, 1996, SOR/97-109.

.8 Ozone-Depleting Substances Regulations, SOR/99-07.

.9 Environmental Code of Practice on Halons, July 1996.

1.5 DEFINITIONS

.1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists substances that have been assessed as toxic. Federal Government can make regulations with respect to a substance specified on List of Toxic Substances. Column II of this list identifies type of regulation applicable to each substance.

.3 Hazardous Waste: for the purpose of the Contract documents, the term "hazardous waste" shall be interchangeable with the term "toxic waste".

1.6 SUBMITTALS

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

.2 Product Data:
.1 Submit WHMIS MSDS - Material Safety Data Sheets.
.2 Submit photocopy of shipping documents and waste manifests to Departmental Representative when shipping toxic wastes off site

1.6 SUBMITTALS (Cont'd)

.2 (Cont'd)

.3 Maintain 1 copy of product data in readily accessible file on site.

1.7 STORAGE, HANDLING, TRANSPORT AND DISPOSAL

.1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

.3 Co-ordinate storage of toxic wastes with Departmental Representative and follow internal requirements for labelling and storage of wastes.

.4 Observe smoking regulations, smoking is prohibited in area where toxic wastes are stored, used, or handled.

.5 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities. Take reasonable measures to contain the release while ensuring health and safety is protected.

.6 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.7 Use authorized/licensed carrier to transport toxic waste.

.8 Co-ordinate transportation and disposal of toxic wastes with Departmental Representative.

.9 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.10 Ensure toxic waste is shipped to authorized/licensed treatment or disposal facility and that liability insurance requirements are met.

1.7 STORAGE, HANDLING, TRANSPORT AND DISPOSAL (Cont'd)

.11 Minimize generation of toxic waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.12 Manage liquid toxic waste originating from dewatering of excavation (impacted groundwater) in accordance with this specification and Section 31 23 33.01.

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 SECTION INCLUDES

.1 This section defines the procedures for the management of hazardous materials associated with miscellaneous Contractor work activities.

.2 Manage disposal of surplus hazardous materials in accordance with Section 02 50 13.

.3 This section does not apply to hazardous waste encountered during excavation activities. Manage hazardous waste from excavation activities in accordance with Section 02 50 13.

1.2 RELATED REQUIREMENTS

.1 Section 02 50 13 - Management of Toxic Waste.

1.3 MEASUREMENT PROCEDURES

.1 Handling, transport and disposal for hazardous materials associated with miscellaneous Contractor work activities shall be included in the lump sum and will not be measured separately for payment.

1.4 REFERENCES

.1 Definitions:

.1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.2 Reference Standards:

.1 Canadian Environmental Protection Act,1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada (Jus)

1.4 REFERENCES (Cont'd)

.2 (Cont'd)
.2 (Cont'd)
.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

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 hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance 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 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.4 Storage and Handling Requirements:
.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

1.6 DELIVERY, STORAGE AND HANDLING (Cont'd)

.4 (Cont'd)

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited on site.

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

1.6 DELIVERY, STORAGE AND HANDLING (Cont'd)

.4 (Cont'd)

.10 (Cont'd)

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Provide secondary containment for storage of liquid hazardous materials and waste.

.10 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.11 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.12 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

1.6 DELIVERY, STORAGE AND HANDLING (Cont'd)

.4 (Cont'd)

.10 (Cont'd)

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.13 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.14 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Description:

.1 Bring on site only quantities hazardous material required to perform Work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 - EXECUTION

3.1 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 reuse and recycling.

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

3.1 CLEANING (Cont'd)

.3 (Cont'd)

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 74 11 - Cleaning.

1.2 MEASUREMENT PROCEDURES

.1 Clearing and grubbing of trees with diameter greater than 25 cm will be measured by number of trees removed. Twenty-five (25) trees with diameter greater than 25 cm are anticipated for removal at landfill 1 and one (1) tree with diameter than 25 cm is expected at landfill 3. The distribution of tree sizes is summarized below:

Diameter	# of Trees
120 cm	1
80 cm	4
70 cm	1
60 cm	7
50 cm	2
40 cm	7
30 cm	4

.2 Clearing grubbing of trees with diameters of 25 cm or smaller and of other shrubs and vegetation will be measured as part of the lump sum and will not be measured separately for payment.

1.3 DEFINITIONS

.1 Clearing:
.1 General clearing: consists of cutting off trees, brush and shrub vegetative growth to within specified height above ground and disposing of felled trees, live or dead plant material, previously uprooted trees and stumps, and surface debris and rubbish.

.2 Grubbing:
.1 General grubbing: consists of excavation and disposal of stumps, and roots to minimum specified depth below existing ground surface.

1.4 QUALITY ASSURANCE

.1 Do construction occupational health and safety in accordance with Section 01 35 28.

.2 Safety Requirements: worker protection.
.1 Workers must wear gloves , long sleeved clothing, eye protection, protective clothing when removing trees.

1.5 STORAGE AND PROTECTION

.1 Prevent damage to fencing, trees, landscaping, utility lines, water courses root systems of trees which are to remain.
.1 Repair damaged items to approval of Departmental Representative.
.2 Replace trees designated to remain, if damaged, as directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site and verify with Departmental Representative, items designated to remain.

.2 Obtain permit from City of Kingston for tree removal.

.3 Locate and protect utility lines: preserve in operating condition active utilities traversing site.

.4 Notify Departmental Representative before starting clearing and grubbing.

3.2 CLEARING

.1 General clearing:
.1 Remove trees, brush, shrubs, down timber, rotten wood, rubbish, and other vegetation.
.2 Cut off isolated trees as directed by Departmental Representative at height of not more than 300 mm above ground surface.
.3 In areas to be subsequently grubbed, height of stumps left from clearing operations to be more than 300 mm above ground surface.
.4 All trees planned for removal must be removed by a certified tree removal company.

.2 Underbrush clearing: clear underbrush indicated and trees less than 50 mm trunk diameter to ground level.

.3 Restrict clearing work to area within limits of construction areas as indicated.

3.2 CLEARING (Cont'd)

.4 Grubbing:
.1 Grub out stumps and roots to minimum depth 300 mm below ground surface.
.2 Depressions and holes made by grubbing may be left open but shall be sloped appropriately to make safe for work in surrounding area.

.5 Use only hand methods for grubbing inside drip lines of trees which are to remain.

3.3 WOOD CHIPPING AND DISPOSAL

.1 Chip all cleared and grubbed materials and timber using wood chipper.

.2 Place wood chips in area designated by Departmental Representative.

.3 Wood chipped material becomes property of CSC Institution.

3.4 FINISHED SURFACE

.1 Leave ground surface in condition suitable for immediate grading, excavation and/or landfilling operations, as applicable.

3.5 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.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 SUMMARY

.1 This Section applies to:
- .1 Temporary access road and lay down areas.
- .2 Stripping of topsoil prior to:
  - .1 Grading of roadside ditches for haul road improvements.
  - .2 Re-grading of road side-slope adjacent to Landfill 3 following excavation.
  - .3 Grading of final ditches at Landfill 1.

1.2 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Section 31 22 16.13 - Sub-Grade Reshaping for Haul Road.

.3 Section 31 23 33.01 - Excavating and Backfilling.

.4 Section 32 11 20 - Granular Base for Haul road.

1.3 MEASUREMENT PROCEDURES

.1 Rough grading for the haul road improvements shall be measured as part of the unit rates (in cubic meters) for granular materials. The unit rate shall include supply, placement, grading and compaction.

.2 Excavation and rough grading of roadside ditches for haul road drainage improvements shall be measured per metre of ditching.

.3 Rough grading for the road side-slope adjacent to former Landfill 3 shall be included in the unit rate for backfilling at Landfill 3 in accordance with Section 31 23 33.01.

.4 Rough grading of final ditches at Landfill 1 will be measured per metre.

.5 Rough grading for work related to the temporary access road and construction lay down areas shall be measured as part of the lump sum and will not be measured separately for payment.

1.4 REFERENCES

.1 ASTM International
.1 ASTM D 698-12, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m ^{3}).

.2 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS PROV 1010 April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.5 EXISTING CONDITIONS

.1 Buried services:
.1 Before commencing work establish 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.
.4 Prior to beginning Work, notify Departmental Representative and establish location and state of use of buried utilities and structures. Contractor to ensure that area has been clearly marked such locations to prevent disturbance during Work.
.5 Confirm locations of buried utilities by careful test excavations.
.6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
.7 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing, and/or re-routing.
.8 Record location of maintained, re-routed and abandoned underground lines.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular material: to Ontario Provincial Standard Specification 1010 for:
.1 Granular A.
.2 Granular B, Type I or II.

2.1 MATERIALS (Cont'd)

.2 Granular material for temporary access road, lay down areas and haul road improvements to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.

.3 Granular material for re-grading of road side-slope adjacent to former Landfill 3 to meet site-specific restoration criteria for soil (see Remedial Action Plan), as determined by laboratory analytical results for samples submitted by Departmental Representative.

.4 Excavated or graded material existing on site suitable to use as fill for grading work if approved by Departmental Representative.

PART 3 - EXECUTION

3.1 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative.

.2 Commence topsoil stripping of areas as indicated after area has been cleared of brush and grasses and removed from site.

.3 Strip topsoil in areas as indicated. Rototill grasses and retain as topsoil on site. Avoid mixing topsoil with subsoil.

.4 Stockpile in locations as directed by Departmental Representative. Stockpile height not to exceed 2 m.

.5 Dispose of unused topsoil as directed by Departmental Representative.

3.2 HAUL ROAD SUB-GRADE RESHAPING

.1 For haul road improvements, do sub-grade reshaping in accordance with Section 31 22 16.13.

3.3 GRADING

.1 For temporary access road and lay-down areas, rough grade to profiles and elevations required to maintain facilities for duration of construction program.
.1 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.2 All roads and laydown areas should be graded with a minimum 3% crossfall towards ditches or surrounding area.

.3 Excavate and grade roadside ditches for the haul road as indicated such that they are at a minimum 0.5m below existing subgrade granular materials.

.4 Grade final ditches around Landfill 1 to depth as indicated.

.5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
.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.

3.5 PROTECTION

.1 Protect existing fencing trees, landscaping, natural features, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT PROCEDURES

.1 Measure reshaping subgrade in square metres of roadway subgrade reshaped.

.2 Additional sub-grade material (Granular B) for the haul road improvements will be measured in cubic meters of aggregate in place.

.1 Hauling, placement, grading, compaction and water for compaction are considered included in the unit rate and will not be measured separately for payment.

1.2 SUBMITTALS

.1 Quality Control: in accordance with Section 01 45 00 - Quality Control.

.1 Submit samples of imported granular materials for haul road to Departmental Representative for analytical testing and approval.

.1 Sampling frequency: 1 per 250 cubic meters of material brought to site.

.2 Soil testing of granular for metals, polycyclic aromatic hydrocarbons (PAHs) benzene, toluene, ethylbenzene and xylens (BTEX), petroleum hydrocarbon fractions (PHC F1 to F4) and polychlorinated biphenyls (PCBs).

.3 Material for haul road to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.

.4 Material that fails to meet criteria above based on laboratory analysis may be rejected for replacement at contractor's cost. Costs for re tests/additional laboratory analysis on replacement material shall be at contractor's expense.

.5 Testing of soil will be carried out by testing laboratory designated by Departmental Representative.

1.3 REFERENCES

.1 ASTM International

1.3 REFERENCES (Cont'd)

.1 (Cont'd)
.1 ASTM D698-12, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort 600 kN-m/m^3.

PART 2 - PRODUCTS

2.1 GRANULAR

.1 Granular material: to Ontario Provincial Standard Specification 1010 for:
.1 Granular B, Type II, for use as additional subgrade for haul road improvements.

.2 Granular material for haul road upgrades to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.

PART 3 - EXECUTION

3.1 STRIPPING OF TOPSOIL

.1 Strip all brush, topsoil and other organics from the existing roadway surface and shoulder areas.

.2 Stockpile in locations as directed by Departmental Representative. Stockpile heights not to exceed 2 m.

.3 Dispose of unused topsoil as directed by Departmental Representative.

3.2 PROOF ROLLING

.1 The exposed granular surface shall be proof rolled under heavy construction equipment (minimum 10,000 kg) under the supervision of the Departmental Representative's.

.2 The Departmental Representative shall identify weak areas requiring subgrade reshaping.

3.3 RESHAPING AND COMPACTING

.1 Where deficiency of material exists:
.1 Excavate to stable subgrade material.
.2 Replace with Granular B Type II material.

3.3 RESHAPING AND COMPACTING (Cont'd)

.1 (Cont'd)
.3 Compact to 100% of materials Standard Proctor Maximum Dry Density.

.2 The existing granular surface should be graded with a minimum 3% crossfall towards ditches.

3.4 CLEANING

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

3.5 PROTECTION

.1 Protect and maintain reshaped surface in condition conforming to this Section until succeeding material is applied.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 43 - Environmental Procedures.

.3 Section 01 45 00 - Quality Control.

.4 Section 02 50 13 - Management of Toxic Waste.

.5 Section 31 32 19.02 - Geosynthetic Clay Liner.

.6 Section 32 91 19.13 - Topsoil Placement and Grading.

.7 Section 32 92 19.16 - Hydroseeding.

1.2 SECTION INCLUDES

.1 Well decommissioning.

.2 Excavation of waste from Landfill 3.

.3 Transport and placement of waste at Landfill 1.

.4 Backfilling of excavation at Landfill 3.

.5 Capping of Landfill 1.

.6 Restoration of Landfills 1 and 3.

1.3 MEASUREMENT PROCEDURES

.1 Non-hazardous waste excavated will be measured in cubic metres based on pre and post excavation surveys comparing topographic surfaces.

.1 Common excavation quantities measured will be actual volume removed within following limits:

.1 Width for excavation as indicated.

.2 Depth from ground elevation immediately prior to excavation, to elevation as indicated.

.2 Include provision for excavation dewatering and water management in unit price for excavation.

.3 Include provision for maintaining temporary berm between wetlands and excavation in unit price for excavation.

1.3 MEASUREMENT PROCEDURES (Cont'd)

.1 (Cont'd)

.4 Measurement for cubic metres of non-hazardous waste to be provided by the Contractor and verified by the Departmental Representative.

.2 The excavation of waste containing potential asbestos containing materials (ACMs) will be measured in cubic metres.

.1 Common excavation quantities measured will be actual volume removed within following limits:

.1 Width for excavation as indicated.

.2 Depth from ground elevation immediately prior to excavation, to elevation as indicated.

.2 Include provision for excavation dewatering and water management in unit price for excavation.

.3 Include provision for maintaining temporary berm between wetlands and excavation in unit price for excavation.

.4 Include provision for asbestos specific requirements (including personal protective equipment, suppression of airborne particles, and equipment decontamination) in unit price for excavation.

.5 Measurement for cubic metres of waste containing potential ACMs to be provided by the Contractor and verified by the Departmental Representative.

.3 Loading and transporting of excavated waste (non-hazardous waste and waste containing potential ACMs) from Landfill 3 to Landfill 1 will be measured in cubic metres equivalent to the cubic metres of waste (non-hazardous waste and waste containing potential ACMs) calculated as having been excavated.

.1 Includes wastes removed from excavation and any surface debris removed from beyond excavation limits at water's edge.

.4 Scarification of existing ground surface at Landfill 1 will be measured in square metres.

.5 Placement, grading and compaction of waste (non-hazardous waste and waste containing potential ACMs) at Landfill 1 will be measured in cubic metres of waste compacted in place based on pre and post surveys comparing topographic surfaces.

1.3 MEASUREMENT PROCEDURES (Cont'd)

.5 (Cont'd)

.1 Measurement for cubic metres of waste to be provided by the Contractor and verified by the Departmental Representative.

.6 Supply, placement and compaction of backfill materials including soil fill and topsoil will be measured in cubic metres compacted in place for each type of material specified.

.1 Type 1, 2 and 3 fill and topsoil materials in accordance with PART 2 - PRODUCTS.

.2 Type 3 Fill is not anticipated to be required during backfilling.

.7 Monitoring well decommissioning will be measured per well.

.8 Waste classification analysis costs will be measured per sample analysed (Landfill 3).

.9 In the event of a significant discrepancy between the Contractor's volume estimate and the Departmental Representative's estimate of materials that cannot otherwise be resolved, an Ontario Land Surveyor (OLS) will be engaged to complete an additional survey for confirmation. To be paid for by the Contractor or Departmental Representative based on which original estimate was least accurate.

1.4 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3}) (600 kN-m/m ^{3}).

.2 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS PROV 1010, April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.2 OPSS 577 November 2006, Construction Specification for Temporary Erosion and Sediment Control Measures.

.3 Ontario Regulations (O.Reg.)

.1 O.Reg. 903 - Wells.

1.4 REFERENCES (Cont'd)

.3 (Cont'd)
.2 O.Reg. 153 - Record of Site Condition, Part IX, Site Condition Standards.

1.5 DEFINITIONS

.1 Excavation classes: Three (3) classes of waste excavation will be recognized; non-hazardous waste, waste containing potential asbestos containing materials (ACMs) and potentially hazardous waste.
.1 Non-Hazardous Waste: Excavation of waste materials of whatever nature including soil, rock, typical household waste (including paper, plastic, glass, metal and ceramics), scrap metal and debris (including empty containers and drums), and construction and demolition waste (wood, roofing material, drywall, brick, tires, etc.).
.2 Waste containing potential ACMs: excavation of construction and demolition waste materials containing roofing materials (i.e. shingles) and/or tiles that may be ACMs.
.3 Potentially Hazardous Waste: excavation of waste materials including industrial wastes (including equipment/drums/pails containing petroleum/oils/lubricants (POLs), solvents, pesticides, polychlorinated biphenyls (PCB)) or severely contaminated soils.

.2 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 25 millimeters in any dimension.

1.6 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.

1.6 SUBMITTALS (Cont'd)

.2 (Cont'd)

.2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.

.3 Submit for review to Departmental Representative results of waste classification analysis as described in EXISTING CONDITIONS article of this Section.

.4 Submit elevation survey information in electronic format (CAD files) for verification by Departmental Representative:

.1 Following scarification of Landfill 1 ground surface and prior to placement of waste at Landfill 1.

.2 Following completion of waste excavation at Landfill 3.

.3 Following completion of waste placement at Landfill 1 and prior to placement of geosynthetic clay liner.

.4 Following placement of cover materials at Landfill 1.

.5 Submit samples of imported Type 1 and Type 2 fill and topsoil to Departmental Representative for analytical testing and approval.

.1 Sampling frequency: 1 per 250 cubic meters of topsoil or fill brought to site.

.2 Soil testing of fill and topsoil for metals, polycyclic aromatic hydrocarbons (PHAs), benzene, toluene, ethylbenzene and xylens (BTEX), petroleum hydrocarbon fractions (PHC F1 to F4) and polychlorinated biphenyls (PCBs).

.3 Type 1 granular fill and topsoil to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture.

.4 Type 2 granular fill and topsoil to meet site specific restoration criteria for soil (see Remedial Action Plan).

.5 Fill or topsoil that fails to meet criteria above based on laboratory analysis may be rejected for replacement at contractor's cost. Costs or re-tests/additional laboratory analysis on replacement material shall be at contractor's expense.

1.6 SUBMITTALS (Cont'd)

.2 (Cont'd)
.5 (Cont'd)
.6 Testing of soil will be carried out by testing laboratory designated by Departmental Representative.

.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 clearance record from utility authority location plan of relocated and abandoned services, as required.

1.7 QUALITY ASSURANCE

.1 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.
.1 Results of analytical tests will be available 72 hours following sample submission.

.2 Health and Safety Requirements:
.1 Incorporate construction occupational health and safety in accordance with Section 01 35 28.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Waste generated from monitoring well decommissioning as described in Part 3 of this Section, to be incorporated as non-hazardous waste at Landfill 1.

1.9 EXISTING CONDITIONS

.1 Buried services:
.1 Before commencing work verify establish 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 an obsolete buried services encountered.
.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

1.9 EXISTING CONDITIONS (Cont'd)

.1 (Cont'd)

.5 Prior to beginning excavation work, notify Departmental Representative and establish location and state of use of buried utilities and structures. Contractor to ensure that area has been clearly marked 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.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing, and/or re-routing.

.9 Record location of maintained, re-routed and abandoned underground lines.

.2 Aboveground service:

.1 Existing guy-wire supporting an existing Hydro support pole located on the South side of Front Road is to be relocated.

.2 Arrange with appropriate authority for relocation of guy-wire and/or support pole.

.3 Collect and have analyzed by a laboratory accredited by the Canadian Association for Laboratory Accreditation, a representative number of samples from the excavated waste from Landfill 3 for waste classification analysis to confirm that wastes destined for Landfill 1 are classified as non-hazardous waste.

.1 Sampling frequency: 1 per 700 cubic meters of waste material.

.2 Parameters:

.1 Toxicity characteristic leaching procedure (TCLP) for inorganics, semi-volatiles, volatiles and polychlorinated biphenyls (PCBs).

.4 Surface features:

.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Excavated waste material:
.1 Material excavated from Landfill 3 which is classified as non-hazardous Waste, as determined by laboratory analytical results submitted to Departmental Representative by Contractor.
.2 Estimated volume of waste: 21,090 cubic meters.

.2 Fill and Topsoil (Type 1) at Landfill 1:
.1 Granular fill and Topsoil meeting Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.
.2 Imported, as required from off-site sources.
.3 Topsoil: to Section 32 91 19.13.
.4 Fill: to Section 31 22 13.

.3 Fill and Topsoil (Type 2) at Landfill 3:
.1 Granular fill and Topsoil meeting site specific restoration criteria for soil (see Remedial Action Plan), as determined by laboratory analytical results for samples submitted by Departmental Representative.
.2 Imported, as required from off-site sources.
.3 Topsoil: to Section 32 91 19.13.
.4 Fill: to Section 31 22 13.

.4 Fill (Type 3) at Landfill 3:
.1 Granular fill meeting site specific restoration criteria for sediment (see Remedial Action Plan), as determined by laboratory analytical results for samples submitted by Departmental Representative.
.2 Imported, only if directed by Departmental Representative.

.5 Silt fencing and straw bales: to OPSS 577.

.6 Geosynthetic clay liner: to Section 31 32 19.02.

PART 3 - EXECUTION

3.1 WELL DECOMMISSIONING

.1 Decommission existing groundwater monitoring wells in Landfill 3 in accordance with O.Reg. 903 (as amended) by licensed well contractor.
.1 Number of wells to be decommissioned: Forty (40) with 50 mm diameter polyvinyl chloride (PVC) riser pipe and screen.
.2 Maximum depth of wells:
.1 Thirty-two (32) at 7 m below ground surface.
.2 Six (6) at 3 m below ground surface.
.3 Two (2) at 12 m below ground surface.

3.2 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces of Landfill 3 to be excavated within limits indicated.

.2 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.

.3 Protect buried services that are required to remain undisturbed.

3.3 STOCKPILING

.1 Stockpile fill materials in new construction lay-down area.

.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, as described under Article 3.5, herein.

3.4 DEWATERING

.1 Manage water in Landfill 3 excavation while Work is in progress.
.1 Estimated natural water table depth: 1.0 m to 2.5 m below ground surface.
.2 Keep working area free of water by pumping seepage water either directly to a holding tank or to a low point of excavation as a temporary measure.

3.4 DEWATERING (Cont'd)

.1 (Cont'd)
.3 All water within excavation shall ultimately be pumped to holding tanks and sampled by Departmental Representative for laboratory analysis prior to discharge or off-site disposal, as deemed appropriate.

.2 Protect open excavations against flooding and damage due to surface run-off.

.3 Provide for Departmental Representative's review details of proposed dewatering methods.

.4 Departmental Representative shall collect and submit water sample(s) of water pumped from excavation for laboratory analysis and comparison to Provincial Water Quality Objectives (PWQO) and CCME Freshwater Aquatic Life (FWAL) criteria.

.5 Dispose of water:
.1 In accordance with Section 01 35 43 to approved runoff areas if analytical results indicate water is appropriate for discharge.
.2 In accordance with Section 02 50 13 to approved off-site disposal facility if analytical results indicate water is not suitable for discharge on-site.

3.5 STORMWATER MANAGEMENT

.1 Perimeter ditching shall be established to divert stormwater flows away from Work area.
.1 At the excavation area (Landfill 3), stormwater runoff generated at the properties north and west of the former waste mound shall be intercepted via ditching and directed to the wetland area to the east.
.2 At Landfill 1, surface run-off from adjacent lands shall be directed to the existing ditches north of the waste mound (flowing towards wetlands) and south of the waste mound (ditch along Front Road).

.2 Light duty silt fence barriers shall be utilized as a minimum during construction and to conform to OPSS 577.
.1 Installation of double silt fencing at the excavation site (Landfill 3).
.2 Installation of single silt fencing at the landfill backfilling/capping work site (Landfill 1).

3.5 STORMWATER MANAGEMENT (Cont'd)

.3 As required, in the ditching to reduce flow rates, straw bale flow checks shall be constructed of double row of bales butted tightly together and installed in accordance to OPSS 577.

3.6 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated for Landfill 3.

.2 To minimize surface water from entering the excavation of Landfill 3, the excavation shall be completed such that a land plug or residual berm on existing material is left as an isolation measure between the working face and the wetland or waters of Little Cataraqui Creek.
.1 Material comprising the berm will be last material removed as part of the excavation.
.2 If the berm or isolation measure is non-permeable (e.g. silt/clay), ensure water levels on the freshly excavated side are equal to those of wetland area prior to removal.

.3 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Departmental Representative.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 Notify Departmental Representative when bottom of excavation is reached.
.1 Assist Departmental Representative with collection of floor and wall soil samples from open excavation.
.2 Departmental Representative to pay for cost of analysis.

.6 Obtain Departmental Representative approval of completed excavation.

.7 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

3.6 EXCAVATION (Cont'd)

.8 Any visible debris identified in the adjacent wetland east a of the landfill and/or ephemeral stream south of the landfill should also be removed. Appropriate surface water and sediment protection measures should be utilized for this work as per Section 01 35 43.

.9 Excavated materials shall be immediately loaded into trucks for hauling to Landfill 1.
.1 Provide number of truck counts on daily log of construction activities.

.10 Complete elevation survey to identify vertical and horizontal extent of excavation.
.1 Raw data and CAD files shall be made available to Departmental Representative for review and verification.

3.7 ASBESTOS

.1 It is expected that during the excavation of Landfill 3, potential non-friable asbestos containing materials (ACMs) comprising roofing materials (shingles) or tiles from an old barn formerly on the CSC property will be encountered.

.2 Excavate, load, transport and place potential ACMs wastes in accordance with this specification.

.3 Whenever possible, potential ACMs shall be handled by heavy equipment only, with no hand work (or workers) in proximity to the materials.

.4 During all phases of work, water shall be used as needed to keep potential ACMs moist and reduce fragments and air borne issues.

.5 Truck loads containing potential ACMs shall be covered during transport from Landfill 3 to Landfill 1.

.6 Excavation equipment and truck beds that come into contact with potential ACMs shall be decontaminated by washing with water at the end of each day prior to parking equipment on-site.

3.7 ASBESTOS (Cont'd)

.7 If workers are required to be in proximity to potential ACMs (e.g. to supervise excavation or unloading activities), they shall wear a properly fitted half face respirator equipped with P100 (particulate) cartridges.

.8 If workers are required to directly handle the potential ACMs (e.g. to remove from equipment or facilitate equipment decontamination) they shall wear disposal protective clothing (tyvek coveralls) and a properly fitted half face respirator equipped with P100 (particulate) cartridges.

.9 Once placed at Landfill 1, the potential ACMs shall be prioritized for re-burial with at least 1 metre of non-hazardous waste placed over the potential ACM waste in such a manner that direct contact with compaction equipment or other equipment operating on the site is avoided.

.10 If reburial cannot be completed the same day as wastes are placed, tarps shall be placed over the potential ACM waste until they can be buried.

3.8 HAZARDOUS WASTE

.1 Stop work immediately and notify Departmental Representative if materials which may contain hazardous wastes (other than asbestos containing materials) are discovered in course of excavation work.

.2 Following notification and hazardous waste identification, provide storage, handling and disposal in accordance with Section 02 50 13.

3.9 BACKFILLING AT LANDFILL 3

.1 Landfill 3:
.1 For backfilling adjacent to existing road, fill materials should be placed in maximum lifts of 0.3 m.
.2 Fill materials shall be compacted using suitable compaction equipment to a minimum of 98% standard proctor maximum dry density.

3.10 CAPPING AT LANDFILL 1

.1 Landfill 1:
.1 Existing ground surface shall be scarified prior to receiving waste material from Landfill 3.

3.10 CAPPING AT LANDFILL 1 (Cont'd)

.1 (Cont'd)

.2 Complete elevation survey of ground surface after scarification and prior to waste placement.

.3 Waste shall be unloaded onto a designated area (i.e. working face), pushed into place, spread and compacted to elevations and slopes as indicated.

.4 Working face shall be limited to distinct and manageable areas.

.5 Wastes shall be placed first in low lying areas until an even elevation is reached across the Land fill area.

.6 Wastes shall be spread with a dozer in maximum lifts of 1 to 1.5 m and compacted with several passes of a tracked vehicle.

.7 Waste layers containing large objects and loose debris shall be mixed with soil in the waste materials to fill significant voids during placement. Soil fill within the waste materials shall be used for this purpose. No additional soil shall be imported to the site to use as void filler.

.8 The final layer shall be rolled with a smooth drum compactor such that it is generally firm and unyielding (compacted to 92% maximum standard proctor dry density) with no abrupt elevation changes (protrusions greater than 12 mm in height) or voids.

.9 Final landfill elevations may differ from design elevations, depending on volume of waste placed at landfill. However, final grades of side slopes and top slopes shall be in accordance with design grades (4H:1V on side slopes and 20H:1V on top slope).

.10 Complete survey of ground surface after waste placement and prior to placement of cover materials.

3.11 GEOSYNTHETIC CLAY LINER

.1 Install geosynthetic clay liner (GCL) on top of relocated waste in Landfill 1 in accordance with Section 31 32 19.02.

3.12 RESTORATION

.1 Upon completion of Work, trim slopes, and correct defects as directed by Departmental Representative.

.2 Place fill materials and topsoil in accordance with project drawings and Section 32 91 19.13 - Topsoil Placement and Grading:

3.12 RESTORATION (Cont'd)

.2 (Cont'd)

.1 Place Type 1 Topsoil at Landfill 1 over GCL.

.2 Place Type 2 Granular Fill and Topsoil at Landfill 3.

.3 If requested by Departmental Representative, place Type 3 Granular Fill at Landfill 3.

.3 Ensure provisions for procurement of Type 3 fill, but place Type 3 Fill at Landfill 3 only when directed by Departmental Representative.

.4 Seeding of topsoil cover over Landfills 1 and 3 in accordance with Section 32 92 19.16 - Hydroseeding.

.5 Planting on tree saplings in accordance with Section 32 93 10 and as directed by Departmental Representative.

.6 Installation of fence around Landfill 1 in accordance with Section 32 31 26.

.7 Clean and reinstate areas affected by Work as directed by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 The unit pricing of the Geosynthetic Clay Liner (GCL) will be measured per square meter of GCL measured in place. The unit rate for measured in place quantities shall be inclusive of allowance for waste, overlap, and anchoring. Waste, overlap and anchoring requirements shall not be measured separately for payment. Final measured in place quantities will be payable based on the as-built drawings.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D4632/D4632M-08(2013)e2, Grab Breaking Load and Elongation of Geotextiles.

.2 ASTM D4643-08, Determination of Water (Moisture) Content of Soil by Microwave Oven Heating.

.3 ASTM D5084-10, Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.

.4 ASTM D5261-10, Measuring Mass per Unit Area of Geotextiles.

.5 ASTM D5993-99(2009), Measuring Mass Per Unit of Geosynthetic Clay Liners.

.6 ASTM D5888-06 (2011), Standard Guide for Storage and Handling of Geosynthetic Clay Liners.

.7 ASTM D6102-12, Standard Guide for Installation of Geosynthetic Clay Liners.

.8 ASTM D6768-04 (2009), Standard Test Method for Tensile Strength of Geosynthetic Clay Liners.

.9 ASTM D5887-09, Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 The GCL installer shall provide to Departmental Representative sufficient evidence of installation experience and competence with the specified geosynthetic materials. The GCL installer shall demonstrate a minimum of 100,000 square metres of GCL installation experience or shall provide sufficient evidence of installation experience and competence with other geosynthetics or shall demonstrate an acceptable level of training and supervision will be utilized in order to ensure the quality of the installation.

.3 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for GCL and include product characteristics, performance criteria, physical size, finish and limitations.

.4 Samples:
.1 Submit to Departmental Representative 2 weeks minimum before beginning Work samples as follows:
.1 Minimum 300 mm x 300 mm samples of GCL.

.5 Certificates:
.1 Submit 2 copies of manufacturer's test data 2 weeks minimum before beginning Work.

.6 Indicate installation layout, dimensions and details, including seams, anchor trenches and protrusion details.

1.4 QUALITY ASSURANCE

.1 Test quality of membrane to ensure consistency of raw material and geomembrane quality in accordance with manufacturer's recommendations.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.5 DELIVERY, STORAGE AND HANDLING (Cont'd)

.3 Storage and Handling Requirements:
.1 Store materials in accordance with manufacturer's recommendations and in accordance with ASTM D5888.
.2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse of pallets, crates, padding and packaging materials.

1.6 SITE CONDITIONS

.1 Do not install in standing water or in rain.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Geomembrane: needle-punched reinforced geosynthetic clay liner.
.1 Supplied in:
.1 Rolls of 5 m minimum width.
.2 Composed of uniform layer of sodium bentonite clay between a scrim reinforced nonwoven bottom geotextile and a staple fiber nonwoven top layer geotextile.

.2 Geosynthetic clay liner physical properties:
.1 Geotextile:
.1 Top/Cap, nonwoven, 200g/m^2 MARV (Maximum Average Roll Values), to ASTM D5261.
.2 Scrim Reinforced, nonwoven, 200g/m^2 MARV, to ASTM D5261.
.2 Bentonite:
.1 Moisture content: maximum 12%, to ASTM D4643.
.3 Finished geosynthetic clay liner:
.1 Bentonite mass per unit area: 3.66kg/m2 MARV, to ASTM D5993.
.2 Tensile strength: 8.8 kN/m MARV, to ASTM D6768.
.3 Peel strength: 65 M min, to ASTM D4632.
.4 Permeability: maximum $5x10^{-9}$cm/sec, to ASTM D5887.

2.1 MATERIALS (Cont'd)

.2 (Cont'd)

.3 (Cont'd)

.3 Seams: Use loose granular bentonite to seal the entire overlap seam, in accordance with manufacturer's recommendations and ASTM D6102. Any accessory bentonite used for sealing seams, penetrations, or repairs, shall be the same granular bentonite as used in the production of the GCL itself.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTION

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 The surfaces to be lined shall be smooth and free of any debris, vegetation, roots, sticks, sharp rocks, or other deleterious materials larger than two inches as well as free of any voids, large cracks or standing water or ice.

.2 Directly prior to deployment of the GCL, the subgrade shall be final-graded to fill remaining voids or desiccation cracks, and proof-rolled to eliminate sharp irregularities or abrupt elevation changes. The surfaces to be lined shall be maintained in this smooth condition.

.3 The surface upon which the GCL material will be installed shall be approved by Departmental Representative prior to placement of the GCL.

.4 An anchor trench shall be excavated by the earthwork contractor or liner installer to the lines and grades shown on the project drawings or as directed in the field.

.1 The anchor trench shall be constructed free of sharp edges or corners and maintained in a dry condition. No loose soil shall be permitted beneath the GCL within the trench.

.2 The anchor trench shall be inspected as well as approved by the Departmental Representative.

3.2 INSTALLATION (Cont'd)

.5 Install panel placement and seaming in accordance with manufacturer's recommendations on graded surface in orientation and locations indicated:
.1 Install in accordance with ASTM D6102.
.2 Install with nonwoven side up to maximize shear strength characteristics.

.6 Provide a minimum overlap of 300 mm at edge seams and 600 mm at end seams. A 230 mm lap line and a 300 mm match line shall be imprinted on both edges of the upper geotextile component of the GCL to assist in installation overlap quality control. Lines shall be printed as continuous dashes in easily observable non-toxic ink. Seal full width of overlap by placing granular bentonite between panels in quantities as recommended by manufacturer. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.

.7 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

.8 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.

.9 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

.10 Departmental Representative to approve installation of membrane and seams.

.11 Repair minor tears and pinholes by patching. Patches to be made of same GCL material, and extend minimum of 300 mm beyond edge of defect.

3.3 COVER

.1 The uncovered edge of GCL panels shall be protected at the end of the working day with a waterproof sheet secured adequately with ballast.

3.3 COVER (Cont'd)

.2 Equipment: Soil cover shall be placed with low ground pressure equipment. Avoid damaging the GCL by making sharp turns or pivots with equipment as well as sudden starts or stops.

.3 Placement: Soils may be placed on the GCL by pushing with a track dozer or by carefully placing it with a loader or a back-hoe. The use of scrapers or pans directly over the GCL is strictly prohibited.

.4 Thickness: A minimum thickness of 300 mm cover shall be kept between heavy equipment and the GCL at all times, except when final-grading.

.5 No heavy vehicles shall be driven directly on the GCL until the proper thickness of cover has been placed.

.6 Compaction: To prevent damage to the GCL, the initial lift(s) of soil cover shall not be compacted in excess of 85 percent Modified Proctor density.

.7 Slope Placement: When covering GCL on sloped areas steeper than 4H:1V, cover shall be pushed up-slope to minimize tension on the GCL.

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.

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

.3 Waste Management: separate waste materials for reuse and recycling.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Do not permit vehicular traffic directly on membrane.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 22 13 - Rough Grading.

.2 Section 31 22 16.13 - Haul Road Subgrade Reshaping.

1.2 MEASUREMENT PROCEDURES

.1 Granular base for the haul road improvements (Granular A) will be measured in cubic meters of aggregate in place.

.1 Hauling, placement, grading, compaction and water for compaction are considered included in the unit rate and will not be measured separately for payment.

.2 Biaxial geogrid for the granular base of haul road to be measured in units of square meters measured in place. The unit rate for measured in place quantities shall be inclusive of allowance for waste and overlap. Waste and overlap requirements shall not be measured separately for payment.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D6637-11, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.

.2 ASTM D7748/7748M-14, Standard Test Method for Flexural Rigidity of Geogrids, Geotextiles and Related Products.

.3 ASTM D4218-96 (2008) Standard Test method for Determination of Carbon Black Content in Polethylene Compounds By the Muffle-Furnace Technique.

.4 ASTM D4355-07 Standard Test method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xeon Arc Type Apparatus.

1.4 SUBMITTALS

.1 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.1 Submit samples of imported granular materials for haul road to Departmental Representative for analytical testing and approval.

.1 Sampling frequency: 1 per 250 cubic meters of material brought to site.

1.4 SUBMITTALS (Cont'd)

.1 (Cont'd)

.1 (Cont'd)

.2 Soil testing of granular for metals, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylens (BTEX), petroleum hydrocarbon fractions (PHC F1 to F4) and polychlorinated biphenyls (PCBs).

.3 Material for haul road to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/ industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.

.4 Material that fails to meet criteria above based on laboratory analysis may be rejected for replacement at contractor's cost. Costs for re tests/additional laboratory analysis on replacement material shall be at contractor's expense.

.5 Testing of soil will be carried out by testing laboratory designated by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular A: to OPSS PROV 1010, April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.2 Granular materials for roads areas to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.

.3 Geogrid: open grid single layer polymer having biaxial orientation, free of striations, roughness pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.

.1 Ultimate tensile strength:

.1 Machine Direction Strength: 16.0 kN/m MARV (Maximum Average Roll Values), to ASTM D6637.

2.1 MATERIALS (Cont'd)

.3 (Cont'd)

.1 (Cont'd)

.2 Cross Machine Direction Strength: 16.0 kN/m MARV, to ASTM D6637.

.2 Tensile strength at 2% strain:

.1 Machine Direction Strength: 6.5 kN/m MARV, to ASTM D6637.

.2 Cross Machine Directino Strength: 7.0 kN/m MARV, to ASTM D6637.

.3 Tensile strength at 5% strain:

.1 Machine Directin Strength: 11.5 kN/m MARV, to ASTM D6637.

.2 Cross Machine Direction Strength: 12.5 kN/m MARV, to ASTM D6637.

.4 Flexural Stiffness/Rigidity:

.1 Machine Direction Strength: 960 g-cm, to ASTM D7748.

.2 Cross Machine Direction Strength: 273 g-cm, to ASTM D7748.

.5 Roll width: 3.9 m minimum.

.6 Roll length: 50 m minimum.

.7 Rib thickness: 1 mm minimum.

.8 Aperture size:

.1 Machine direction: 39 mm.

.2 Cross machine direction: 39 mm.

.9 Polymer: polypropylene:

.1 Minimum Carbon Black Contents: 2% to ASTM D4218.

.2 Resistance to UV Degradation: 100%to ASTM D4355.

PART 3 - EXECUTION

3.1 PLACING

.1 Place on a clean surface, properly shaped and compacted and free from snow or ice.

.2 Where indicated in drawings, place biaxial geogrid over the prepared subgrade.

.1 Place in accordance with manufacturer's specific instructions, under the supervision of Departmental Representative.

.2 Unroll geogrid manually over the prepared subgrade.

.3 Overlap adjacent and end rolls between 0.3 m and 0.9 m to be confirmed by Departmental Representative based on the subgrade strength.

.4 Use plastic cable ties to maintain overlap and alignment.

.5 Do not drive tracked vehicles directly on the geogrid.

3.1 PLACING (Cont'd)

.3 Spread each granular layer uniformly using approved grading equipment and methods. Final granular thickness shall be 300 mm compacted thickness placed in layers not exceeding 150 mm compacted thickness.

.4 Complete rough grading in accordance with Section 31 22 13.

3.2 COMPACTING

.1 Compact each layer to minimum 100% Standard Proctor Density.

.2 Add water as required to maintain material at or near optimum moisture content while compacting.

3.3 FINISHING

.1 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction.

.2 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.

3.4 FIELD QUALITY CONTROL

.1 The Departmental Representative may perform field and laboratory tests for control of moisture, density and aggregate gradation. Results will control Contractor's operations.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT PROCEDURES

.1 Measure supply and erection of wire fence in metres erected. The unit rate shall include all associated materials, equipment and labour costs.

.2 Supply and installation of the steel gate shall be measured as part of the lump sum and will not be measured separately for payment.

1.2 REFERENCES

.1 ASTM International
.1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

.2 CSA International
.1 CSA G42-1964(R1998), Galvanized (Zinc-Coated) Steel Farm-Field Wire Fencing.
.2 CAN/CSA-O80 Series-08(R2012), Wood Preservation.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.

.3 Storage and Handling Requirements:
.1 Store materials in accordance with manufacturer's recommendations.
.2 Store and protect fence and gate from damage.
.3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Wire fence:
.1 Farm-field type: to CSA G42, standard 748.

.2 Gates:

2.1 MATERIALS (Cont'd)

.2 (Cont'd)
.1 Frame: to ASTM A 53, galvanized steel pipe, standard weight, 25 mm outside diameter.
.2 Size: as indicated.
.3 Joints: electrically welded.

.3 Steel posts:
.1 Steel "T-bar" fence posts.
.2 Galvanizing: zinc coating, minimum 92 g/m^2 of surface area.

.4 Timber posts:
.1 Sound, seasoned wood with ends cut square.
.2 Gate posts: 2.7 m long and 200 mm minimum diameter at small end.
.3 Straight, free from splits, shakes and excessive knots.
.4 Existing knots trimmed flush with surface.
.5 Posts to be treated in accordance with CAN/CSA-O80 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Grading:
.1 Level ground along fence line in order to ensure that bottom wire of fence between posts can be maintained at not more than 200 mm above ground.

3.3 ERECTION OF FENCE

.1 Erect fence along lines as indicated.

.2 Installation of posts:

3.3 ERECTION OF FENCE (Cont'd)

.2 (Cont'd)
.1 Space intermediate posts at maximum 5 m distance.
.2 Space corner, end and gate posts 3 m from adjacent post.
.3 Locate and erect gate posts as indicated.
.4 Install posts true to line and plumb with 1.35 m of post projecting above ground.

.3 Fencing with steel posts:
.1 Install steel posts to depth of 1000 mm.
.2 Set following items in concrete:
.1 End and corner posts.
.2 Ends of braces for corner and end posts.
.3 Brace corner and end posts.
.4 Clamp a studded steel projection arm to each post.
.5 Erect woven wire.
.6 Stretch wires to have uniform tension.
.7 Attach wires to posts and projection arms with metal clips.

.4 Fencing with wood posts (gate posts):
.1 Excavate post holes by methods approved by Departmental Representative.
.2 Slant of post tops to be perpendicular to fence line.
.3 Install cleats for anchoring at gate and anchor posts.
.4 Embed in concrete.
.5 Backfill around posts and compact to same density as surrounding ground.
.6 Install braces at gate posts. Join braces into posts and spike securely.
.7 Erect wires and stretch to have uniform tension.
.8 Attach top wires to posts with 2 staples minimum. Fasten other wires to posts with at least one staple.

3.4 INSTALLATION OF GATES

.1 Install gates in locations as indicated.

.2 Install gates to prevent over-stress on gate posts when gates are open.
.1 Install on level ground with ground clearance of 100 mm maximum.

.3 Locate anchor pipe for drop bolt, and install pipe flush with road grade surface.

3.5 CLEANING

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

.2 Clean and trim areas disturbed by operations. Dispose of surplus material.

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

.4 Waste Management: separate waste materials for reuse and recycling.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 Supply, placement and compaction of topsoil over the geosynthetic clay liner at Landfill 1 (Type 1 Topsoil) and of topsoil for site restoration at Landfill 3 (Type 2 Topsoil) shall be measured in accordance with Section 31 23 33.01.
.1 Type 1 and Type 2 topsoil materials in accordance with PART 2 - PRODUCTS.

.2 Topsoil placement in all other restored areas shall be measured as part of the lump sum and will not be measured separately for payment.

1.2 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 samples of imported Type 1 and Type 2 topsoil in accordance with Section 3123 33.01.

1.3 CLOSEOUT SUBMITTALS

.1 Operational and Maintenance Data:
.1 Maintenance Data: include grass maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

1.4 REFERENCES

.1 Agriculture and Agri-Food Canada
.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 ASTM D6102-12, Standard Guide for Installation of Geosynthetic Clay Liners.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 35 43.

.2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.

1.5 WASTE MANAGEMENT AND DISPOSAL (Cont'd)

.3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 - PRODUCTS

2.1 TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
.1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
.2 Contain no toxic elements or growth inhibiting materials.
.3 Free from debris, stones and/or vegetative material over 25 mm in any dimension.
.4 Consistence: friable when moist.

.2 Type 1 Topsoil:
.1 Topsoil meeting Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture, as determined by laboratory analytical results for samples submitted by Departmental Representative.
.2 To be used in cover materials above geosynthetic clay liner at Landfill 1.

.3 Type 2 Topsoil:
.1 Topsoil meeting site specific restoration criteria for soil (see Remedial Action Plan), as determined by laboratory analytical results for samples submitted by Departmental Representative.
.2 To be used during backfilling and site restoration activities at Landfill 3.

2.2 SOURCE QUALITY CONTROL

.1 Advise Departmental Representative of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Submit samples of Type 1 and Type 2 topsoil to Departmental Representative for analytical testing and approval.

2.2 SOURCE QUALITY CONTROL (Cont'd)

.3 (Cont'd)

.1 Soil testing for metals, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbon fractions (PHC F1 to F4) and polychlorinated biphenyls (PCBs).

.2 Type 1 topsoil to meet Ontario Ministry of Environment (MOE) Table 3 standards for commercial/industrial land use and coarse soil texture.

.3 Type 2 topsoil to meet site specific restoration criteria for soil (see Remedial Action Plan.

.4 Topsoil that fails to meet criteria above based on laboratory analysis may be rejected for replacement at contractor's cost. Costs for re tests/additional laboratory analysis shall be at contractor's expense.

.5 Sampling frequency: 1 per 250 cubic meters of topsoil brought to site.

.4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.

.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

PART 3 - EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide erosion control measures in accordance with 01 35 43.

3.2 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 25 mm diameter and other deleterious materials.

.4 Dispose of removed material off site or as directed by departmental representative.

3.3 PLACING AND SPREADING OF TOPSOIL

.1 Place topsoil after Departmental Representative has accepted subgrade and/or geosynthetic clay liner placement.

.2 Manually spread topsoil as indicated to following minimum depths after settlement:
.1 300 mm for seeded areas above geosynthetic clay liner at Landfill 1.
.1 No equipment tires and/or tracks shall be driven over the GCL during soil placement until a minimum of 300 mm cover of topsoil is established as to ASTM D6102.
.2 Place topsoil cover as directed by Section 31 32 19.02.
.2 150 mm for seeded areas at Landfill 3.

3.4 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 Departmental Representative.
.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 ACCEPTANCE

.1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 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 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:
.1 Schedule hydroseeding to coincide with preparation of soil surface.

1.2 MEASUREMENT PROCEDURES

.1 Hydroseed supply and placement shall be measured in units of cubic metres based on hydroseed mixture/material type.
.1 Shoreline Mix and Meadow Mix in accordance with PART 2 - PRODUCTS.

1.3 REFERENCES

.1 Canada Fertilizer Act and Regulations.

.2 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS 572, Construction Specification for Seed and Cover.

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 seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.

.3 Submit in writing 7 days prior to commencing work:
.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 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:
.1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
.2 Inoculant containers to be tagged with expiry date.

.3 Storage and Handling Requirements:
.1 Store fertilizer off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

1.6 WARRANTY

.1 For seeding, 12 months warranty period is extended to 1 full growing season.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Seed:
.1 For Landfill 1 cover and nearby affected areas:
.1 Ontario Seed Company (OSC) Native Prairie Meadow Mix:
.1 Contains: 7% Black Eyed Susan, 1% Early Goldenrod, 4% Evening Primrose, 25% Fowl Bluegrass, 2% Foxglove/Beardtongue, 20% Indiangrass, 15% Little Bluestem, 1% New England Aster, 1% Showy Tick trefoil, 22% Switchgrass, 1% White Vervain, 1% Wild Bergamot.
.2 For Landfill 3 restoration and nearby affected areas:
.1 Ontario Seed Company (OSC) Shoreline Mix.

2.1 MATERIALS (Cont'd)

.1 (Cont'd)

.2 (Cont'd)

.2 Contains: 9% Blue vervain, 10% Blunt Broom Sedge, 25% Fox Sedge, 10% Green Bulrush, 1% Purple Stemmed Aster, 1% Spotted Joe Pye Weed, 1% Swamp Milkweed, 8% Sweet Flag, 35% Virginia Wild.

.3 Seed mixes to be applied at rate of no less than 25 kg/hectare.

.4 Nurse crop to be added to seed mix at rate of no less than 22 kg/hectar.

.5 In the event dormant seeding is undertaken and additional 10 % of seeds will be applied to account for loss to runoff and birds.

.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%.

.3 Tackifier: water dilutable, liquid dispersion water soluble vegetable carbohydrate powder or as approved by Departmental Representative.

.4 Water: free of impurities that would inhibit germination and growth.

.5 Fertilizer:

.1 To Canada "Fertilizers Act" and Regulations.

.2 For Landfill 1 cover and nearby affected areas:

.1 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

.3 For Landfill 3 restoration and nearby affected areas:

.1 Complete synthethic, phosphate-free, with 60% or more of nitrogen in water insoluble form.

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 Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 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 Departmental Representative.

3.3 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 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

.4 Obtain Departmental Representative's approval of grade and topsoil depth before starting to seed.

3.4 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Departmental Representative. Supply equipment required for this work.

3.4 PREPARATION OF SLURRY (Cont'd)

.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.

3.5 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 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 Blend application 300 mm into adjacent grass areas or sodded areas previous applications to form uniform surfaces.

.5 Re-apply where application is not uniform.

.6 Remove slurry from items and areas not designated to be sprayed.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
.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.

3.6 CLEANING (Cont'd)

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
.1 Clean and reinstate areas affected by Work.

3.7 PROTECTION

.1 Protect seeded areas from trespass until plants are established.

.2 Remove protection devices as directed by Departmental Representative.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by Departmental Representative.

.3 Grass Mixture:
.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

3.9 ACCEPTANCE

.1 Seeded areas will be accepted by Departmental Representative provided that:
.1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.

.2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Requirements for plantings of saplings as compensation for trees removed following a policy of 'for every tree removed two are planted' in accordance with Section 01 35 43.

.1 Trees removed with an identified diameter of greater than 25 cm and less than 50 cm shall be replaced with a mixture of native non-invasive deciduous tree saplings with a minimum height of 80 cm and maximum height of 300 cm and native non invasive deciduous shrubs with a minimum height of 45 cm.

.2 Trees removed with an identified diameter of 50 cm or more shall be replaced with non-invasive deciduous tree saplings that are a minimum height of 150 cm and maximum height of 300 cm with a minimum caliper of 15 mm.

.3 Compensation planting shall consist of planting of saplings at locations as instructed by the Departmental Representative.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 31 11 00 - Clearing and Grubbing.

1.3 MEASUREMENT PROCEDURES

.1 Tree and shrub plantings will be measured by the number of saplings planted of each respective type.

.1 Type 1 Trees/Shrubs and Type 2 Trees in accordance with PART 2 - PRODUCTS.

.2 The unit rates shall be inclusive of all materials and labour required for planting as well as maintenance during the warranty period.

1.4 REFERENCES

.1 Definitions:

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

.2 Reference Standards:

.1 Agriculture and Agri-Food Canada (AAFC).

1.4 REFERENCES (Cont'd)

.2 (Cont'd)
.1 (Cont'd)
.1 Plant Hardiness Zones in Canada-2000.
.2 Canadian Nursery Landscape Association (CNLA)
.1 Canadian Standards for Nursery Stock-2006.
.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from Departmental Representative of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:
.1 Quantity and type of plant material.
.2 Shipping dates.
.3 Arrival dates on site.
.4 Planting Dates.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for trees and shrubs, 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.

1.7 QUALITY ASSURANCE

.1 Qualifications:
.1 Landscape Contractor: to be a member in Good Standing of Landscape Ontario Horticultural Trades Association.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
.1 Protect plant material from frost, excessive heat, wind and sun during delivery.
.2 Protect plant material from damage during transportation:

1.8 DELIVERY, STORAGE AND HANDLING (Cont'd)

.1 (Cont'd)

.2 (Cont'd)

.1 Delivery distance is less than 30 km and vehicle travels at speeds under 60 km/h, tie tarpaulins around plants or over vehicle box.

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.2 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within 1 hours in accordance with supplier's written recommendations and after arrival at site in storage location approved by Departmental Representative.

.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 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials.

1.9 WARRANTY

.1 For plant material as itemized on plant list the 12 months warranty period is extended to 24 months.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

1.9 WARRANTY (Cont'd)

.3 Departmental Representative reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
.1 Source of plant material: grown in Zone in accordance with Plant Hardiness Zones in Canada.
.2 Plant material must be planted in zone specified as appropriate for its species.
.3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 For bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.5 Plant Lists:
.1 Type 1 Trees/Shrubs shall include a mixture of native non-invasive deciduous tree saplings with a minimum height of 80 cm and maximum height of 300 cm and native non invasive deciduous shrubs with a minimum height of 45 cm.
.2 Type 2 Trees shall include non-invasive deciduous tree saplings that are a minimum height of 150 cm and maximum height of 300 cm with a minimum caliper of 15 mm.
.3 Shrubs must be native non-invasive deciduous shrub species such as:
.1 Alternate-leaved Dogwood (Cornus alternifolia L. Fil).
.2 Speaked Alder (Alnus incana).
.3 Hawthorne (Crataequs chysocarpa Ashe).
.4 Serviceberry (Amelanchier Medik).
.5 Nannyberry (Viburnum lentago).

2.1 PLANT MATERIAL (Cont'd) .5 (Cont'd)

.3 (Cont'd)

.4 Trees must be native non-invasive deciduous tree species such as:

.1 Red Maple (Acer rubrum).
.2 Sugar Maple (Acer saccharum).
.3 Bur oak (Quercus macrocarpa).
.4 Red Oak (Quercus rubra).
.5 Black Cherry (Prunus serotina).
.6 Black Walnut (Juglans nigra).
.7 Shabqark Hickory (Carya ovata).
.8 Basswood (Tilia americana).

.5 The following trees will not be permitted:

.1 Manitoba Maple (Acer negundo).
.2 Norway Maple (Acer platanoides).
.3 Silver Maple (Acer saccharinum).
.4 All species of Ash (Fraxinus).
.5 All species of Willow (Salix).
.6 Poplars, Aspens and Cottonwoods (Populus sp.).

2.2 WATER .1 Free of impurities that would inhibit plant growth.

2.3 STAKES .1 Wood, pointed one end, 38 x 38 x 2300 mm.

2.4 WIRE TIGHTENER .1 Steel.

2.5 GUYING WIRE .1 Steel, 3 mm wire.

2.6 CLAMPS .1 Crimp type.

2.7 ANCHORS .1 Wood:

.1 Type 1: 38 x 38 x 460 mm.

2.8 GUYING COLLAR .1 Tube: plastic, 13 mm diameter, nylon reinforced.

2.9 MULCH .1 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.

2.10 FERTILIZER .1 Complete synthetic, phosphate-free, with 60% or more of nitrogen in water insoluble form.

2.10 FERTILIZER (Cont'd)

.1 (Cont'd)
.1 Use mycorrhiza as recommended by manufacturer's written recommendations.
.2 Ensure new root growth is in contact with mycorrhiza.

2.11 ANTI-DESICCANT

.1 Wax-like emulsion.

2.12 SOURCE QUALITY CONTROL

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

3.2 PRE-PLANTING PREPARATION

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

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

3.2 PRE-PLANTING PREPARATION (Cont'd)

.5 Notify and acquire written acknowledgement from utility authorities before beginning excavation of planting pits for trees and shrubs.

.6 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.
.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 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 Establishment of sub-grade for planting beds in accordance with Section 31 22 13.

.2 Preparation of planting beds in accordance with Section 32 91 19.13.

.3 For individual planting holes:
.1 Stake out location and obtain approval from Departmental Representative excavating.

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 directed by Departmental Representative.
.1 Orient plant material to give best appearance in relation to surrounding area.

.5 For trees and shrubs:
.1 Backfill soil in 150 mm lifts.

3.4 PLANTING (Cont'd)

.5 (Cont'd)

.1 (Cont'd)

.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 Provide trees with a watering saucer as large as the excavated area. The saucer shall retain water around the roots of the plant.

.6 Water plant material thoroughly.

.7 After soil settlement has occurred, fill with soil to finish grade.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as directed by Departmental Representative.

.2 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Install tree supports to CSA B651-12.

.2 Use single stake tree support for deciduous trees and evergreens.

.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 guying wire through guying collar tube.

.1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.

.3 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.

3.7 MULCHING (Cont'd)

.2 Spread mulch as directed by Departmental Representative.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by Departmental Representative.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Remove weeds.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate as required to keep top layer of soil friable.

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Reform damaged watering saucers.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

3.9 MAINTENANCE DURING WARRANTY PERIOD (Cont'd)

.1 (Cont'd)

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.

.6 Apply fertilizer in early spring as indicated by soil test.

.7 Remove dead, broken or hazardous branches from plant material.

.8 Keep trunk protection and tree supports in proper repair and adjustment.

.9 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.10 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

.11 Submit monthly written reports to Departmental Representative identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.

.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.

.3 Waste Management: separate waste materials for reuse and recycling.

3.11 CLOSEOUT ACTIVITIES

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

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 This section defines the installation of pipe culverts and storm drains.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 31 22 16.13 - Haul Road Subgrade Reshaping.

1.3 MEASUREMENT PROCEDURES

.1 The permanent pipe culvert installation beneath the haul road shall be measured as part of the lump sum and will not be measured separately for payment.

.2 The temporary pipe culvert beneath the temporary access road at the site entrance shall be measured as part of the lump sum and will not be measured separately for payment.

1.4 REFERENCES

.1 ASTM International
.1 ASTM F667-12, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.
.2 ASTM D1248-12e1, Standard Specification for Polyethylene Plastic s Extrusion Materials for Wire and Cable.
.3 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600 kN-m/m^2.

.2 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS. PROV 1010, April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for pipes and backfill and include product characteristics, performance criteria, physical size, finish and limitations.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance 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 accordance with manufacturer's recommendations.
.2 Store and protect pipes from damage.
.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse of pallets, crates, padding and packaging materials.

PART 2 - PRODUCTS

2.1 CORRUGATED POLYETHYLENE PIPE AND FITTINGS

.1 Pipe: Solid corrugated high density polyethylene (HDPE) to ASTM F667.

.2 Polyethylene resin: to ASTM D1248, Grade W8.

.3 Weathering resistance: to ASTM D1248, Class C.

.4 Joining system/connection: soil tight.

2.2 GRANULAR BEDDING AND BACKFILL

.1 Granular bedding and backfill material to Ontario Provincial Standard Specification 1010 for:
.1 Granular B, Type I or II.

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 pipe culvert installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.

3.1 EXAMINATION (Cont'd)

.1 (Cont'd)

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 TRENCHING

.1 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.

.2 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.

.3 Restrict vehicle operations directly adjacent to open trenches.

.4 Dispose of surplus and unsuitable excavated material with waste materials placed at Landfill 1.

.5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.6 Notify Departmental Representative when bottom of excavation is reached.

.7 Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.3 BEDDING

.1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place 100 mm minimum thickness of approved granular material on bottom of excavation and compact to 95% minimum of corrected maximum dry density of maximum density to ASTM D 698.

.3 Place bedding in unfrozen condition.

3.4 LAYING POLYETHYLENE PIPE

.1 Begin pipe placing at downstream end at culvert.

3.4 LAYING POLYETHYLENE PIPE (Cont'd)

.2 Install pipe in trench by lowering.

.3 Ensure bottom of pipe is in contact with shaped bedding throughout pipe length.

3.5 JOINTS FOR POLYETHYLENE CULVERTS

.1 Install couplings in accordance with manufacturer's instructions.

3.6 BACKFILLING

.1 Backfill around and over culverts as indicated as indicated in drawings.

.2 Place granular backfill material, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% maximum standard proctor density to ASTM D698 taking special care to obtain required density under haunches.

.4 Protect installed culvert with minimum 300 mm cover of compacted fill before heavy equipment is permitted to cross.

.5 Place backfill in unfrozen condition.

3.7 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
.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.

.3 Waste Management: separate waste materials for reuse and recycling.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION