



Public Works and
Government Services
Canada

SPECIFICATIONS

TITLE: RESTORATION OF RUNWAY 07-25 AND MOVEMENT AREAS

SITE: ÎLES-DE-LA-MADELEINE AIRPORT

PROJET No: R.075188.001

DATE: 2016-04-27

SR4 SPECIFICATIONS

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ISSUES REGISTER

DATE	ISSUED FOR	DESCRIPTION
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Part 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises:
 - .1 Pavement milling on runway 07-25, on taxiways Alpha and Bravo and on apron;
 - .2 Pavement cracks cleaning and sealing, in accordance with their degree of stringency, on the existing runway 07-25, taxiways and apron;
 - .3 Punctual surface defect correction on runway 16-34;
 - .4 Existing marking removal prior to laying new asphalt pavement;
 - .5 Pavement overlay on existing pavement of runway 07-25, taxiways and apron;
 - .6 Granular reloading of runway and taxiways edges to meet pavement new levels;
 - .7 Marking on runway 07-25, taxiways and apron;
 - .8 Lifting of lighting and other electrical works;
 - .9 Leveling manholes and catch basins located in works area;
 - .10 Construction of a new access road and its connection to runway 07-25;
 - .11 Installation of culvert pipes;
 - .12 Vegetation removal along existing fences;
 - .13 Fences and gates erection;
 - .14 Fences rehabilitation;
 - .15 Topsoil and hydraulic seeding works;
 - .16 Replacement and relocation of survey markers;
 - .17 Traffic management;
 - .18 Supply and installation of a temporary RTIL lighting system at displaced threshold.
 - .19 Hand over to Departmental Representative the temporary RTIL lights system and transformers at the end of works.

1.2 CONTRACT METHOD

- .1 Construct work under unit price contract.
- .2 Except for works / services which are the subject of a specific item in the unit price schedule, all costs incurred by the Contractor to meet the requirements of various sections of the 01 division must be included in the Site organization or in the unit prices of the contract.

1.3 WORK BY OTHERS

- .1 Co-operate with other Contractors, if applicable, in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 If applicable, co-ordinate works with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

1.4 WORK SEQUENCE

- .1 Construct Work in stages, in accordance with the phasing plan, to accommodate Owner's continued use of premises during construction.
- .2 Execute work within the delays prescribed in section 01 32 16.07 Construction progress schedule – Bar (Gantt) Chart.
- .3 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.
- .4 Maintain all access for fire control and plan fire control means.

1.5 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises to allow:
 - .1 Owner occupancy;
 - .2 Work by other contractors;
 - .3 Public use.
- .2 Co-ordinate use of premises under direction of Departmental Representative.
- .3 The area dedicated to the Contractor for the construction of site facilities (Contractor's office, Departmental representative's office, storage of materials , etc.) is shown in the plans.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.6 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.7 EXISTING SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where work involves breaking into or connecting to existing services, give Departmental Representative 7 days notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to tenant operations.
- .3 Provide alternative routes for personnel and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services when directed by Departmental Representative to maintain critical building and tenant systems.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .10 Record locations of maintained, re-routed and abandoned service lines.

1.8 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 are specified.

Part 2 PRODUCTS

- .1 Not used.

Part 3 EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 CASH ALLOWANCES

- .1 Unless otherwise indicated, cash allowance covers the net cost of the Contractor, products, services, equipment and construction equipment, transport, handling, unloading, storage and other authorized expenses incurred in the execution of works or services.
- .2 The contract price, not the cash allowance covers the overheads of the Contractor and benefits related to cash allowance.
- .3 The contract price will be adjusted by written order to take into account any surplus or deficit in relation to the intended cash allowance.
- .4 If actual costs exceed the amount of cash allowance, the Contractor will receive compensation for the additional justified costs incurred, plus an allowance for overhead and profit established as further specified in the contractual documents.
- .5 Deposits for authorized work subject to a cash allowance will be included in the monthly payment certificate issued by Departmental Representative.
- .6 The amounts of each allowance granted for work or services prescribed in the relevant sections of the specifications are shown below:
 - .1 An allowance of \$ 50,000 is specified in Section 01 35 13.13 - Special Procedures - Airport in use for the provision of airport escorts services.
 - .2 An allowance of \$ 25,000 is specified in Section 01 35 13.13 - Special Procedures - Airport in use for expenses associated with maintaining, during a runway closure, medical transport services including emergency medical evacuations.

Part 2 - PRODUCTS

2.1 NO OBJECT

- .1 No used.

Part 3 - EXECUTION

3.1 NO OBJECT

- .1 No used.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Contractor's responsibilities towards Quality control are described in section 01 45 00 – Quality Control.
- .2 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under sections as follows:
 - .1 Section 31 05 16 – Aggregate materials
 - .2 Section 31 23 33.01 – Excavation, trenching and backfilling
 - .3 Section 32 11 23 – Aggregate base course
 - .4 Section 32 12 16 – Asphalt paving
 - .5 Section 32 91 19.13 – Topsoil placement and grading.

1.2 APPOINTMENT AND PAYMENT

- .1 The Contractor shall designate a laboratory that will perform all the required tests and will assume the service fees.
- .2 The Departmental Representative will appoint a second laboratory to conduct testing to perform quality assurance, and he will pay for his services.
- .3 When inspections or tests by the testing laboratory designated by the Departmental Representative reveal the non-compliance of the works with the requirements of the contract, the Contractor shall pay the cost of testing and additional inspections that the Departmental Representative may request to see if the corrections are acceptable.

1.3 CONTRACTOR'S RESPONSABILITIES

- .1 Provide labour, equipment and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative 48 hour's minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

Part 2 PRODUCTS

.1 Not used.

Part 3 EXECUTION

.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 Sunday, inclusively, will provide seven (7) day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .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.
- .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 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.
- .4 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 - Submittal Procedures.
- .2 Submit to Departmental Representative within ten (10) 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 five (5) working days of receipt of acceptance of Master Plan.

1.4 MILESTONES

- .1 Project milestones form interim targets for Project Schedule.

Phase	Description	Time frame
Before the construction work	Proceed with a joint inspection at the pavement manufacturing plant, provide an inspection report and recommendations in regards to the upgrade of the plant, proceed with the upgrade of the plant and finally proceed to a joint inspection to validate the upgrade of the plant. Mobilization, site preparation and temporary installations.	60 days
Phase 1	A : Construction of access road. B : Crack repairs on runway 16-34.	August 1 st to September 2 nd 2016
Phase 2	A : Junction levelling, crack repairs and resurfacing with a bituminous pavement on Taxiway Bravo. B : Crack repairs, resurfacing with a bituminous pavement and surface marking on Taxiway Bravo.	August 29 th to September 2 nd 2016 September 5 th to 9 th 2016
Phase 3	Milling, crack repairs, resurfacing with a bituminous pavement and surface marking on runways 07-25 and 16-34 intersection.	September 5 th to 9 th 2016
Phase 4	Milling, crack repairs, resurfacing with a bituminous pavement and surface marking on runway 07-25. Transition milling, crack repairs, resurfacing with a bituminous pavement and surface marking on Taxiway Alpha. Removal of vegetation cover and reload of runway ends with MG 20b.	September 9 th to 30 th 2016
Phase 5	Transition milling, crack repairs, resurfacing with a bituminous pavement and surface marking on half of the apron (towards Taxiway Alpha).	October 1 st to 8 th 2016
Phase 6	Transition milling, crack repairs, resurfacing with a bituminous pavement and surface marking on half of the apron (towards Taxiway Bravo).	October 9 th to 14 th 2016

1.5 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 five (5) working days.
- .3 Revise impractical schedule and resubmit within five (5) working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan and respecting Phasing 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.
 - .5 Excavation.
 - .6 Backfill.
 - .7 Roadway structure.
 - .8 Sewer system.
 - .9 Milling of existing pavement.
 - .10 Crack repairs.
 - .11 Laying of bituminous pavement.
 - .12 Surface marking.
 - .13 Runway, taxiway and apron lighting.

1.7 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

1.8 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, 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.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

1.9 SPECIAL REQUIREMENTS

- .1 Construction Works will be carried out throughout the summer and part of the fall seasons of 2016.
- .2 Works carried out will consist mainly of the following:
 - .1 Mobilization.
 - .2 Site preparation and temporary installations.
 - .3 Drainage works.
 - .4 Construction of an access road.
 - .5 Crack repair works on runways and movement areas.
 - .6 Implementation of a bituminous pavement overlay on Runway 07-25 and on the Taxiways.
 - .7 Existing asphalt paving removal, by milling, on runway, taxiway and apron segments.

- .8 Removal of vegetation cover and reload of runway ends with MG 20b.
- .9 Surface marking.
- .10 All other necessary works indicated in the plans.
- .3 All demolition work, implementation of foundations, pavement and electrical work shall be done following the phasing in the plan for the work.
- .4 The contractor must note that Runway 07-25 will remain operational during the entire duration of phases 1, 2, 3, 5 and 6. During the entire duration of phase 3, the runway threshold will be moved. Runway 16-34 will remain operational during the entire duration of the work phases 1A, 2B, 4, 5 and 6.
- .5 With the exception of the work phase 4, west of Runway 16-34, that may start simultaneously with phase 3, each stage must be done in its entirety (granular foundations, leveling, crack repair, pavement and marking) before proceeding to a next phase.
- .6 The Contractor will have to clear the runway of all equipment and staff when aircraft movements are scheduled at the airport or at any other time following the Departmental Representative's instructions. At these occasions, follow rapidly the signals and immobilize the staff and equipment at a minimum distance of 75 m from the runway centreline for Runway 07-25 and 60 m from the runway centreline for Runway 16-34. Wait for the Departmental Representative's signal before bringing back all equipment or staff on the runway.
- .7 The projected schedule of movement areas utilisation by aircrafts is presented in Appendix B – Flight schedule. This schedule can be modified at any times, subject to a 15 days' notice given by the Departmental Representative.
- .8 Work must take place in continuous, outside hours of operation of movement areas by aircrafts.
- .9 The contractor must anticipate moving a minimum of four (4) additional times per week (2 x arrival-departure) for the MEDIVAC emergency evacuations that can occur anytime. The contractor will then have to remove all equipment and personnel out of movement areas to permit aircraft movements. The Contractor will be notified a minimum of one (1) hour before the arrival of the aircraft.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

- .1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 ADMINISTRATIVE

- .1 Submit to the Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for the extension of the 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 the Departmental Representative. This review confirms that the necessary requirements have been or will be determined and verified, and that each submittal has been checked and co-ordinated with the 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 the Departmental Representative, in writing at time of submission, identifying deviations from the requirements of the Contract Documents and stating the reasons for deviations.
- .7 Verify that the field measurements and the affected adjacent Work are co-ordinated.
- .8 The Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.
- .9 The Contractor's responsibility for deviations in submission from the requirements of Contract Documents is not relieved by the Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site

1.2 SHOP DRAWINGS AND TECHNICAL DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by a professional engineer registered or licensed in Quebec, Canada.
- .3 Shop drawings must indicate materials, methods of construction, attachment or anchorage to be used, assembly diagrams, details regarding connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .4 Allow ten (10) days for the Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect value of Work, state such in writing to the Departmental Representative prior to proceeding with the Work.
- .6 Make changes in shop drawings as the Departmental Representative may require, consistent with the Contract Documents. When resubmitting, notify the 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, technical data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date of preparation 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 the Contractor's authorized representative certifying the approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Materials and details of fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies
- .10 Submit three (3) printed copies of shop drawings for each requirement requested in the specification sections and as the Departmental Representative may reasonably request.
- .11 Submit three (3) copies of product data sheets or brochures for the requirements requested in the specification sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .12 Submit two (2) copies of the test reports for requirements requested in the specification sections and as requested by the Departmental Representative.

- .1 Report signed by the authorized official of the testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with the specified requirements.
- .2 Testing must have been within three (3) years of date of contract award for the project.
- .13 Submit two (2) copies of the certificates for requirements requested in the specification sections and as requested by the Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by the responsible officials of the manufacturer of product, system or material attesting that product, system or material meets the specification requirements.
 - .2 Certificates must be dated after the award of the project contract complete with the project name.
- .14 Submit two (2) copies of the manufacturer's instructions for the requirements prescribed in the specification sections and as requested by the Departmental Representative.
 - .1 Pre-printed material describing the installation method of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit two (2) copies of the Manufacturer's Field Reports for the requirements requested in the specification sections and as requested by the Departmental Representative.
 - .1 Documentation of the testing and verification actions taken by the manufacturer's representative to confirm compliance with the manufacturer's standards or instructions.
- .16 Submit two (2) copies of Operation and Maintenance Data for requirements prescribed in the specification sections and as requested by the Departmental Representative.
- .17 Delete information not applicable to the project.
- .18 Supplement standard information to provide details applicable to the project.
- .19 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication or installation work may be undertaken. If shop drawings are rejected, noted copy will be returned and resubmission of the corrected shop drawings, through the same procedure indicated above, must be performed before proceeding with works of fabrication and installation.
- .20 The review of the shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with the general concept.
 - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with the Contractor submitting them, and such review shall not relieve the Contractor of the responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

- .2 Without restricting the generality of foregoing, the Contractor is responsible for the dimensions confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of sub-trades.

1.3 SAMPLES

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

1.4 MOCK-UPS

- .1 Achieve the mock-ups in accordance with section 01 45 00 - Quality Control.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit the required documents as requested by the CNESST.
- .2 Submit transcription of insurance immediately after the award of Contract.

Part 2 PRODUCTS

- .1 Not used.

Part 3 EXECUTION

- .1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 REFERENCES

- .1 « Tome 5 des Normes - Ouvrages routiers du MTQ ».

1.3 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of laws, regulations and ordinances governing the movement and use of roads on which it is necessary to perform work or to transport materials and equipment.
- .2 Where work is performed on an in-service road, carry out the following:
 - .1 Arrange the material as to cause minimal inconvenience and risk to users.
 - .2 Gather the material as much as possible and preferably on the same side of the road.
 - .3 Do not leave equipment on the road overnight.
- .3 No lane should be closed without the permission of the airport authorities.
- .4 The Contractor shall take no action that may affect taxiways, runways or airport operations.
- .5 Keep the road clean and unhindered access to airport operations. The road shall be sufficiently wide to allow proper use.
- .6 Create an access road as specified in the plans.

1.4 INFORMATION AND WARNING DEVICES

- .1 Supply and install signage and other similar devices intended to indicate the presence of a construction zone or any other temporary situation resulting from the performance of work requiring a reaction or reflex on the part of the road users, and maintain them.
- .2 Provide signage, delineators, barricades and other warning devices, in accordance to Volume 5 of Standards - Roadworks of the MTQ (Tome 5 - Normes - Ouvrages routiers du MTQ) for circulation outside of the restricted area. For work within the restricted area, refer to the phasing plans.
- .3 Position signage and other devices to the recommended locations in accordance to Volume 5 of Standards - Roadworks of the MTQ (Tome 5 - Normes - Ouvrages routiers du MTQ) for circulation outside the restricted area. For work within the restricted area, refer to the phasing plans. Before beginning work, consult with the Departmental Representative to establish with him a list of signage and other devices necessary for the work. If the situation on site changes, review the list to the satisfaction of the Departmental Representative.
- .4 The Departmental Representative may request adjustments after site installation, notwithstanding the prior acceptance of the reference board.

- .5 Maintain all signage warning devices as follows.
 - .1 Check signage daily to ensure they are readable, in good condition, at the right location to meet the needs. Clean, repair or, as applicable, replace the signage in order to maintain clarity and reflectance.
 - .2 Remove or cover signage that does not apply to existing situations, these situations may vary from one day to another.

1.5 CONTROL OF PUBLIC TRAFFIC

- .1 Ensure the presence, on site, of competent flagman services whose training and equipment comply with the Quebec regulations for the situations listed below:
 - .1 When public traffic must bypass vehicles or equipment blocking the roadway, in whole or in part;
 - .2 When traffic is heavy, the approach speeds high and the signage system is down;
 - .3 When workers and equipment are at work on the road, beyond the top of a slope, at the turn of a sharp curve or in other locations where users cannot be otherwise warned in an effective way;
 - .4 When temporary protection measures are required during installation or removal of signage;
 - .5 When emergency protection measures are required due to the inability to quickly obtain signage devices;
 - .6 In all cases where other signage devices do not ensure complete protection of workers, equipment and public traffic.

1.6 TRAFFIC RESTRICTIONS

- .1 Maintain existing traffic conditions throughout the work.

Part 2 PRODUCTS

- .1 Not used.

Part 3 EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 DEFINITIONS

- .1 Restricted zone: Every zone located inside the airport where access is prohibited by a sign or by any other means is a restricted zone.
- .2 Movement Area: The part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron.

1.2 MEASUREMENT FOR PAYMENT

- .1 The activities related to maintenance of traffic, signage and access to the site are not the subject of site measures. These activities are payable on a lump sum basis. The payment of these articles is performed at 25% of the total amount at the beginning of the work. The remaining 75% is payable in proportion to the progress of work at the time of the progressive payment requests.
- .2 The Contractor shall pay directly to the Operator of the airport, the expenses associated with the provision of escort services. These services are subject to a monetary allowance included in the contract price and will be reimbursed at cost as described in Section 01 21 00 - Allowances.
- .3 The Contractor shall pay directly to the private company designated by the Regional Health Authority, the expenses associated with maintaining, during the closing period of the runway, the medical transportation service including emergency medical evacuations. These services will be subject to a monetary allowance included in the contract price and will be reimbursed at cost as described in Section 01 21 00 - Allowances.
- .4 All other costs incurred to comply with the requirements of this section shall be included in the overheads of the Contractor and proportionally distributed in the various submitting payment items.

1.3 RESPONSIBILITY OF CONTRACTOR

- .1 Take notice of regulations concerning airport circulation and instruct staff and subcontractors.
- .2 Be responsible of his staff, construction vehicles and subcontractors working on this project and that will enter restricted zones.
- .3 The Contractor shall ensure they are aware of the airport security regulations introduced in the general specifications and the Plan of Operations for the Construction (PEC) specific to this project and instruct its employees and its subcontractors. A copy of the Operating Plan for the Construction (PEC) approved by the competent authorities will be provided.
- .4 Consult the regulations at the following address: <http://www.tc.gc.ca/eng/acts-regulations/acts-air.htm> under the tab "Government Property Traffic – Airport Traffic Regulations".
- .5 Provide the Departmental Representative with a list of the responsible personnel (including email and cell phone number), including an escort services manager, which in an emergency, can be reached after working hours.
- .6 Designate from among his employees a responsible person who will maintain constant contact with the airport escort.

1.4 GENERAL PROTECTION

- .1 Do not disrupt airport business except as permitted by the Departmental Representative.

- .2 Provide temporary protection for the safe handling of public, personnel, pedestrians and vehicular traffic.
- .3 Place barriers and lights where indicated on the plans to ensure the safe movement of aircrafts and to protect the Contractor's workers.

1.5 MOVEMENT OF EQUIPMENT AND PERSONNEL

- .1 If the work is carried out in the airport areas that are open to air traffic:
 - .1 Obtain Departmental Representative's approval on scheduling of Work.
 - .2 Control movements of equipment and personnel as directed by the Departmental Representative.
 - .3 Obey signals from the airport authorities instantly.
 - .4 Park at the location specified by the Departmental Representative any equipment that is not used.
 - .5 Storing materials and machinery so that their top remains at all times below the theoretical line from the end of the runway and moving away from it. Everything must conform to the zoning plan of the obstacle limitation surfaces of the airport and the TP-312 standards.
 - .6 Place red lights atop piles of materials, according to the Departmental Representative's instructions, if required.

1.6 OPERATIONNAL RESTRAINTS

- .1 Comply with safety and security operational requirements and any other applicable requirements during Work and alongside runway, taxiway and apron in operation, including, but not limited to:
 - .1 The integrity of all electronical and visual navigation aids associated to aviation activities taking place at the same time must be maintained for aircraft movements, prevailing on Work; Every shut-down period for electrical work must be done by the Contractor.
 - .2 Underground power cables, for transmission and control and all other equipment and underground services located near construction area have to be protected and identified;
 - .3 The movement capability of emergency relief services must be maintained at all times. Service roads must be checked by Departmental Representative on a biweekly basis to ensure that access is maintained at all times. Alternate roads, to be approved, must be planned if new work is anticipated to affect the access.
- .2 The Contractor shall consider that runway 07-25 will be in operation, including but not limited to, during the following periods:
 - .1 Phase 1 (From August 1st to September 2nd 2016).
 - .2 Phase 2 (From August 29th to September 2nd 2016).
 - .3 Phase 3 (From September 5th to September 9th 2016).
 - .4 Phase 5 (From October 1st to October 8th 2016).
 - .5 Phase 6 (From October 9th to October 14th 2016).

- .3 The Contractor shall consider that runway 16-34 will be in operation, including but not limited to, during the following periods:
 - .1 Phase 1A (From August 1st to August 20th 2016).
 - .2 Phase 2B (From August 29th to September 2nd 2016).
 - .3 Phase 4 (From September 5th to September 30th 2016).
 - .4 Phase 5 (From October 1st to October 8th 2016).
 - .5 Phase 6 (From October 9th to October 14th 2016).
- .4 All phases are preceded by a closing and preparation stage and are followed by a phase inspection and reopening of the runways.
 - .1 The closing and preparation stage involves the sequential closure of runways to perform the positioning work for displaced thresholds, the marking work and the implementation of security measures surrounding the intersection of the runways.
 - .1 The airport operator has to issue appropriate NOTAMs;
 - .2 The Contractor shall proceed with the implementation of all the safety elements in the following order:
 - .1 Adjustments to the light signals, surface markings and signage.
 - .2 Implementation of the displaced threshold, if that is the case.
 - .3 Inspection by officials of the Departmental Representative in the presence of the Contractor;
 - .4 The Contractor shall make the required corrections;
 - .5 Following the corrections requested, the Contractor shall obtain official authorization to commence work.
 - .2 The inspection and reopening of the runways stage involves a full inspection of the works, site areas, and audits required to enable the full reopening of the runways. This verification is made in the presence of officials from Transport Canada, the Departmental Representative in the presence of the Contractor. All surfaces must be clean, swept and free of debris. Runway strips must be fully exposed. The corrections will be made promptly by the Contractor.
- .5 NOTAMs will be issued according to the different activities of phases presented subsequently.
- .6 Modifications to the light signals, surface markings and signage due to the change of declared distances are expected in all phase changes.
- .7 As the work progresses, the Contractor must temporarily relocate the identification runway lights, the threshold lights, the runway end lights and the taxiway lights.
- .8 The implementation of all elements must be performed by the Contractor under the supervision of Transport Canada and the Departmental Representative.
- .9 Temporary airfield lighting, if necessary, should be done with solar lights (eg. Carmanah model OL4 or approved equivalent). The temporary airfield lighting must be positioned as indicated. The following colors may be used: red, blue, green, yellow and white.
- .10 During the work, the following security measures will be implemented:
 - .1 The construction areas will be identified using the appropriate airport signage.
 - .2 Escort teams will be allocated to the work to ensure the airside operational safety.
 - .3 All vehicles on the movement area must be equipped with yellow rotating beacon.

- .4 During scheduled aircraft movements or in the event of a non-scheduled movement, the Contractor shall clear all material, equipment and personnel on the side of the runway at a distance of at least 75 meters from the runway centreline for runways 07-25 and 60 meters from the runway centreline for runway 16-34 within a maximum of 15 minutes before the plane movement and as ordered by the escort.
- .5 The runways are operated on 45 meters (150 feet) width and taxiways are operated on 23 meters (75 feet) width. No reduction of the widths of runways or taxiways is planned.
- .6 Routine checks are in place to ensure the safety of the site (FODs, lighting, etc.).
- .7 The maximum height of the equipment will be five (5) meters.
- .11 During construction, pilots must announce their arrival or departure at least ninety (90) minutes in advance. Instructions to this effect will be mentioned in the NOTAMs.
- .12 A pedestrian corridor will remain functional at any time from the terminal to the aircrafts parked on the apron.

1.7 AREAS CLOSED TO AIRCRAFT TRAFFIC

- .1 The Contractor shall be responsible for the supply, installation, maintenance and removal of barricades and lighting units for the delimitation of areas closed to aircraft traffic.
- .2 Equipment parking and storage of materials shall be permitted only in the courtyard of the Contractor.
- .3 The equipment must be stored in designated storage areas or as directed by the Departmental Representative.
- .4 The Contractor is advised that because of the turmoil that can come from aircraft, all tags and beacons must be securely fastened and secured and all delineators must be properly anchored by using sandbags or by being bolted to the pavement.

1.8 TEMPORARY MARKING AND BEACONING

- .1 The Contractor shall provide, install, move or remove as necessary, temporary runway and taxiway closing markings.
 - .1 On the runways, the closure markings will be placed at each end of the runway so as to cover the identification marks of the runway or the section of runway closed. Additional markings are placed so that the interval between two successive marks does not exceed three hundred (300) meters.
 - .2 The axial marks on the taxiway shall be removed from the runway area or a yellow "X" be positioned on the ground at each end of the taxiway or at the section closed to traffic movement.
 - .3 The dimensions of the closure markings are indicated in the plans. The color of closure markings for a runway shall be white and for a taxiway, the color of closure markings shall be yellow.
 - .4 Runway closure markings will be moved onto the shoulder of the runway according to the progress of work on runway 07-25.
 - .5 Runways and taxiway closure markings will consist of a geomembrane 0.15 mm minimum thickness polyethylene anchored to the ground as to withstand bad weather and jet engine thrusts or consist of plywood painted and weighted down with sand bags. The method must be approved by the Engineer.
- .2 The Contractor shall provide, install, maintain and move, according to the progress of work, the markers for the work performed on the apron.

- .1 On the apron, markers shall be installed with a maximum distance of ten (10) meters between each marker to form a barricade.
- .2 Barricades shall be composed of TRV7 polyethylene barrels type markers approved by the MTQ and provided with a 84 mm wide band of white reflective film of high density and a 120 mm wide band of fluorescent orange. The markers must have a total height of 1 321 mm, a thickness of 4 mm, a diameter at the head of 318 mm and a base diameter of 495 mm. The approximate weight of each marker must be 4.5 kg.
- .3 The markers will be weighted down with wired tire-derived weights with a minimum weight of 15 kg and each marker must be weighted down so as to withstand bad weather and jet engine thrusts. The markers used for delimiting the apron area and access to the site on the apron must be removed at the end of the day.
- .3 At night, the Contractor shall install or relocate as applicable, the following marker lights:
 - .1 Temporary marker lights on runway edge and taxiway. To do this, use the existing lights relocated to delineate the edges of the designated operational runway. Temporary runway edge marker lights shall have a maximum height of 300 mm, spaced 60 meters apart and placed symmetrically on either side of the operational runway section
 - .2 Barricades will be equipped with red lights of continuous lighting and must have the following characteristics:
 - .1 Type: Omnidirectional.
 - .2 Color: Red.
 - .3 Average intensity CD X 1000: 0.4 CD – Candela.
 - .4 Interval between lights: Maximum 3.0 m.
 - .5 Installation height: 350 mm.
 - .3 Marker lights installation must be compliant to frangibility standards for objects located within the runway strip limits.
 - .4 The Contractor shall perform all temporary electrical connection work necessary to ensure the safe operation of the lights.
- .4 When a taxiway is closed, turn off or hide the marker lights that announce the taxiway. The masking method should not damage the existing panels.
- .5 The markings of the relocated threshold 25 must be carried out according to the details shown on the plans.

1.9 MARKER LIGHTS

- .1 Install red solar lights on markers to close access to a closed taxiway.
- .2 Disable the beaconing circuit of the taxiway and the portion of the apron that are closed. If this is not possible, cover the beacon lights with opaque object to avoid any possible leaks.
- .3 Runway 07-25 – Relocated Threshold 25:
 - .1 Threshold 25 existing lights off.
 - .2 Threshold 25 PAPI System off.
 - .3 Lowering the wind indicator.
 - .4 Runway lights turned off between the existing Threshold 25 and the relocated Threshold 25.
 - .5 Temporary threshold lights installed at 1 105 m (3 625') from Threshold 07.
 - .6 Temporary IDHL installed at relocated Threshold 25.

- .7 Runway lights functional over a distance of 1 100 m (3 620 feet).
- .4 Runway 07-25 – Closed:
 - .1 Existing threshold 07 and 25 lights off.
 - .2 Existing approach 07 and 25 lights off.
 - .3 Runway lights off.
 - .4 IDHL off.
 - .5 PAPI System off.
 - .6 Lower the wind indicator.
- .5 Runway 16-34 – Closed:
 - .1 Existing threshold 16 and 34 lights off.
 - .2 Existing approach 16 and 34 lights off.
 - .3 Runway lights off.
 - .4 IDHL off.

1.10 ESCORT

- .1 The Airport escort services will be provided by the airport operator. The Operator of the airport will also provide escort vehicles and the necessary radio frequencies for communication between the Flight Information Station (FSS) and the escort.
- .2 Every vehicle or person to enter and move within a restricted area of the airport shall be accompanied by an escort and each vehicle must be equipped with an amber rotating beacon.
- .3 The Contractor and its employees must comply immediately with the escorts' instructions. The Contractor shall notify the operator of the airport at least twelve (12) hours in advance of any changes to the schedule or the work program when escorts are required, in order to enable the latter to plan work schedules of staff assigned to escort services.
- .4 The Departmental Representative on the site will ensure the transmission of flight information to the Contractor. The latter shall provide the name of two of its employees (one permanent representative and one backup) to serve as links between the Departmental Representative and the person responsible for the work.
- .5 Comply promptly and immediately with the instructions and guidelines of the Departmental Representative.
- .6 The radios required for communications between the Contractor and the Departmental Representative shall be provided by the Contractor.
- .7 The Contractor vehicles and equipment access to the site shall be limited to the secured entranceways. These access points require security personnel at all time during periods of work, which will be provided by the Contractor.
- .8 No vehicle or transportation related to the work shall travel on paved surfaces (runway, taxiway and apron) located outside the limits of the work without escort by the authorized security services.
- .9 All vehicles requiring airside access will be escorted unless a marked path has been set up. Once within the site limits, vehicles can circulate freely.
- .10 During the work, the escort team shall control all access between the airside and landside of the airport. Guards shall be posted at the entrance and exit points and these accesses shall be closed when they are not used.

- .11 The dedicated escort staff shall be equipped with radios to be in constant communication with the foreman and field supervisor. The Contractor shall mark (using cones) all paths to follow by its trucks from the entrance of the restricted area to the work area. In addition, cones or barricades must be installed to delineate the area where the Contractor can work freely without conflict with air traffic.
- .12 The Contractor, for its part, shall have the necessary resources and equipment on the premises to quickly follow the instructions and directives of the escort. To do so, the Contractor shall assign to the different checkpoints, qualified personnel (flagman) strictly dedicated to monitoring and controlling the movement of employees and construction vehicles.
- .13 According to the progress of work, the Contractor shall provide the number of flagmen required to control each crossing between the worksite and each operational taxiway, and this, in addition to the normally posted flagman at the site entrance of the airport.
- .14 The Contractor shall provide escorts (flagman) for the needs of the worksite as well as the necessary radios with required frequency for communications between the Contractor, the Departmental Representative and the Operator of airport's escort services. The escort personnel of the Contractor shall be in constant communication with the airport escorts within the restricted areas.
- .15 To this end, the Contractor shall prepare and submit, for approval, an Action Plan and present it to the Departmental Representative before the work begins. The Action Plan should include the following:
 - .1 The method of communication between the airport's escort services and the Contractor's escort services;
 - .2 The procedure of the Contractor to cross a restricted area;
 - .3 The method of the Contractor to see that this plan of action is followed by all stakeholders (including the Departmental Representative, subcontractors, etc.) on the worksite;
 - .4 Other procedures for the movement of vehicles within an airport environment.
- .16 The Contractor shall notify the Departmental Representative at least forty eight (48) hours in advance of any changes to the schedule or the work program when escorts are required. This requirement is necessary to plan the staff time allocated to airport escort services.

1.11 GENERAL PROVISIONS FOR AIRPORT ACTIVITIES

- .1 Refer to the construction work plan and to the plans for the details related to the work to be carried out at the airport.
- .2 The construction equipment and material storage areas shall be confined to construction areas or areas indicated by the Departmental Representative. The airside equipment storage and parking areas are constructed to meet the requirements of the TP-312 standard. Assigned areas shall be delimited for the storage of materials.
- .3 The Contractor shall be able to communicate by personal radio to all persons on the site to facilitate, in a fast and effective response manner, instructions for the moving of construction areas. This contact will be maintained at all times during the construction period.
- .4 The mobilization for the work must be coordinated closely with the Departmental Representative to ensure that all precautions for airport security are properly implemented. Instructions will be provided at the kick-off meeting of the construction work.
- .5 All airside areas (runway, taxiway, apron, etc.) are considered to be non-smoking. The "Contractor Safety Superintendent" will ensure that all construction workers are informed and adhere to this restriction.

- .6 The Contractor shall ensure the functioning of the night runway lights for the duration of the work.
- .7 All actions must be taken in accordance with the rules and regulations of the Ministry of Sustainable Development, Environment and the fight against Climate Change (MDDELCC).
- .8 All Stakeholders site will receive training to sensitize them to the proactive policy surrounding the safety management systems and risk analysis. Every person and vehicle circulating on the site will also receive clear instructions on how to circulate on the airport "AIRSIDE" before being allowed to proceed.
- .9 A joint inspection with all stakeholders will be performed to ensure that no debris is found on the runways and taxiways before reopening to traffic of aircraft
- .10 The Contractor will have to manage its waste regularly to avoid any problems on the runways and taxiways open to traffic of aircraft during the construction period.

Part 2 - PRODUCTS

- .1 Not used.

Part 3 - EXECUTION

- .1 Not used.

END OF SECTION

Part 1 GENERAL

GENERAL NOTE: in this section, the term "Site" includes all the facilities on the site where the construction is taking place (site itself, buildings, access, infrastructure, parking lots, docks, etc.).

1.1 REFERENCES

- .1 Province of Quebec
 - .1 Law on health and safety, R.S.Q., c. S-2.1.
 - .2 Safety Code for the construction work, R.S.Q., c. S-2.1, r 4.

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to the Departmental Representative the worksite-specific Health and Safety Plan in accordance with the article « General Requirements » of the present section, within ten (10) days prior to the commencement of the work.
- .3 The Departmental Representative will consider the prevention program prepared by the Contractor for the construction site and deliver its comments within ten (10) working days of receipt of this document. If necessary, the Contractor will revise its prevention program and submit it again to the Departmental Representative no later than five (5) days after receiving the comments from the Departmental Representative. The Departmental Representative reserves the right to not allow the beginning of work on the site until the contents of the prevention program is satisfactory. The Contractor shall subsequently update its prevention program and submit it to the Departmental Representative if the scope of the work changes, if the working methods of the Contractor differs from its original forecast or for any other applicable new condition.
- .4 The Departmental Representative's review of the prevention program, prepared by the Contractor for the site, should not be construed as an endorsement of the program and does not limit the overall responsibility for health and safety during the construction work.
- .5 Submit to the Departmental Representative, a minimum of one (1) weekly report from health and safety inspections carried out on the site by the authorized representative of the Contractor.
- .6 Submit to the Departmental Representative, within twenty-four (24) hours, a copy of any report of inspection, correction notice or recommendations issued by the health and safety inspectors from the federal, provincial and territorial governments.
- .7 Submit to the Departmental Representative, within twenty-four (24) hours, an investigation report for any accident resulting in injury and for any incident that highlights a potential risk.

The investigation report must contain at least the following elements:

1. date, time and location of the accident.

2. name of the subcontractor involved in the accident.
 3. number of people involved and condition of the wounded.
 4. identification of witnesses.
 5. detailed description of the tasks performed at the time of the accident.
 6. equipment used to perform the tasks performed at the time of the accident.
 7. corrective measures taken immediately after the accident.
 8. causes of the accident.
 9. preventive measures in place to avoid a similar accident.
- .8 Submit to the Departmental Representative WHMIS MSDS in accordance with Section 01 33 00 - Submittal Procedures. The Contractor shall also keep a copy of these records on site.
- .9 Medical surveillance: Where a law, regulation or a safety program prescribes, submit, before the beginning of the work, the certification of the medical supervision of the staff working on the site. Forward to the Departmental Representative additional certification for all new employees working on the site.
- .10 Transmit to the Departmental Representative a response plan in case of an emergency along with the prevention program. The emergency response plan should contain the items listed in article « General Requirements », in the present section.
- .11 Provide the Departmental Representative copies of training certificates for the construction workers, including the following courses (where applicable):
- .1 First Aid in the workplace and cardiopulmonary resuscitation (CPR).
 - .2 Work likely to release asbestos dust (required for work with asbestos).
 - .3 Work in enclosed spaces (required for work in confined spaces).
 - .4 Lockout (required for work requiring lockout).
 - .5 Safe driving of forklifts (required for any use of forklifts).
 - .6 Safe driving elevating work platforms (required for any use of aerial work platforms).
 - .7 Any other training required by regulation or by the prevention program.
- In addition, the certificates of the *General health and safety courses for construction sites* be available on request on site.
- .12 Plans and engineering certificates of conformity: The Contractor must forward to the Departmental Representative and to the *Standards Commission, equity, health and safety* (CNESST) a signed and sealed copy, by an engineer, of all plans that are required by the *Safety Code for the construction work, R.S.Q (S-2.1, r.4)*, another law, another regulation or other provision of the estimate or the contract. It must also provide a certificate of compliance signed by an engineer after the installation for which the plans have been designed and was completed before a person uses this facility. A copy of these documents should be available at all times on site.

1.3 PRODUCTION OF SITE OPENING NOTICE

- .1 Before beginning the work, send the site opening notice to the CNESST. Transmit to the Departmental Representative a copy of the notice and the acknowledgment received from the CNESST.

At the end of the work, the closure notice must be sent to the CNESST, with a copy to the Departmental Representative.
- .2 The Contractor shall assume the role of prime contractor at all times within the site boundaries and wherever else he must perform work within the framework of this project. The Contractor shall acknowledge the prime contractor's responsibility and identify himself as such in site opening notice it transmits to the CNESST.
- .3 The Contractor shall agree to divide and identify the site adequately, to set the time and space at any time during the project period.

1.4 RISK ASSESSMENT/SAFETY HAZARD

- .1 Perform a site specific risk assessment/safety hazard for the works related to project.

1.5 MEETINGS

- .1 Organize a health and safety meeting with the Departmental Representative before the work begins, and provide leadership.
- .2 A decision representative of the Contractor shall attend all meetings related to health and safety on site.
- .3 It is expected that there will be twenty-five (25) or more workers on site at any time of the work, the Contractor shall establish a project committee and hold meetings as required by the *Safety Code for construction* (S-2.1, r. 4). A copy of the minutes of the meetings of the site committee shall be forwarded to the Departmental Representative a maximum of five (5) days from the date of the committee meeting.

1.6 REGULATORY AGENCIES REQUIREMENTS

- .1 Do work in accordance with Section 01 41 00 - Regulatory Requirements.
- .2 Comply with all laws, all regulations and all the standards that are applicable to the performance of work.
- .3 Observe the prescribed standards and regulations to ensure proper conduct of work on land contaminated with hazardous or toxic materials.
- .4 Always use the latest version of the standards cited in the *Safety Code for the construction work* (S-2.1, r 4), notwithstanding the date specified in the Code.

1.7 COMPLIANCE REQUIREMENTS

- .1 Comply with the *health and safety of the Labour Act* (RSQ, c. S-2.1) and the *Safety Code for the construction work* (S-2.1, r. 4) in addition to meeting all the requirements of this specification.

1.8 RESPONSIBILITY

- .1 The Contractor must accept and assume all duties and obligations normally assigned to the general contractor under the *Occupational Health and Occupational Safety Act* (RSQ, chapter S-2.1) and the *Safety Code for construction* (S-2.1, r 4).
- .2 The Contractor shall assume responsibility for the health and safety of people present on the site, as well as the protection of property located on the site; also assume, in areas adjacent to the site, the protection of people and the environment to the extent that they are affected by the work.
- .3 Regardless of the size and location of the project, the Contractor shall clearly delineate the boundaries of the site by physical means; he must also comply with the specific regulatory requirements to this end. The means chosen to delineate the site are to be submitted to the Departmental Representative.
- .4 Respect and enforce respect by the employees, the safety requirements set out in the contract documents, ordinances, local, territorial, provincial and federal laws and regulations, as well as the prevention program prepared for the construction site.

1.9 WORK PERFORMED BY EXTERNAL CONTRACTORS

- .1 On this project, it is expected that the following work will be performed by an external contractor who is not employed by the Contractor:
- .2 The Contractor shall take the necessary measures to protect the health and safety of the external contractors that are not in contractual relation with him but who are mandated by the Departmental Representative to perform work. In return, these external contractors are required to submit to the authority of the Contractor (general contractor), a subordination agreement that will be signed by the Contractor and each external contractor for this purpose and given to the Departmental Representative before the beginning of the work of each external contractor (see the wording in article SUBORDINATION AGREEMENT ON SST).

1.10 GENERAL REQUIREMENTS

- .1 Before beginning the work, prepare a prevention program at the site, based on the preliminary assessment of risks/dangers in accordance with article "RISK ASSESSEMENT/SAFETY HAZARD" and the article "RISKS INHERENT TO THE WORKSITE" in the present section. Implement this program in application and ensure compliance in all respects to the demobilization of all site personnel. The prevention program should consider the project specifics and must cover all the work done on site.

The prevention program must include at least the following:

- .1 Company policy on health and safety.
- .2 Description of the phases of the work.
- .3 Total cost of the work, schedule and projected enrollment diagram.
- .4 Responsibilities organizational chart for health and safety.
- .5 Physical and material organization of the site.
- .6 Risk identification for each phase of work and the corresponding preventive measures and implementation modalities.

- .7 Identification of prevention measures linked with the specific risks in the workplace indicated in Article RISKS INHERENT TO THE WORKSITE.
- .8 Identification of preventive measures for the health and safety of employees and/or the public on the site such worksite specified in Article SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND PUBLIC.
- .9 Required training.
- .10 Procedures in case of accidents/injuries.
- .11 Written commitment from all stakeholders to respect this prevention program.
- .12 The site inspection grid based on preventive measures
- .13 Contingency plan in case of emergency, which must contain at least the following elements:
 - .1 Site evacuation procedure.
 - .2 Identification of resources (police, firemen, ambulances etc.).
 - .3 Identification of persons responsible on site.
 - .4 Identification of rescuers.
 - .5 Communications chart (including the site manager and the Departmental Representative).
 - .6 Training required for those responsible for its implementation.
 - .7 Any other necessary information, given the characteristics of the site

The Departmental Representative will provide the Contractor with the evacuation procedure of the site, if any; the Contractor will then join include the evacuation procedure with the construction site procedure and forward a copy to the Departmental Representative.
- .2 The Departmental Representative may send its comments in writing if the prevention program contains anomalies or if it raises concerns, and may require the submission of a revised program that will correct these anomalies or eliminate these concerns.
- .3 In addition to the prevention program, the Contractor shall prepare and submit to the Departmental Representative a specific written procedure for work with high risk of accidents (ex. demolition process, special installation procedure, lifting plan, entry confined space entry procedure, power outages procedures, etc.) or at the request of the Departmental Representative.
- .4 The Contractor shall plan and organize work so as to help eliminate danger at the source or provide collective protection and thus minimize the use of personal protective equipment.
- .5 Equipment, tool or a means of protection that cannot be installed and used without compromising the health and safety of workers or the public is deemed to be inadequate for the job.

- .6 All mechanical equipment (ex. hoists for persons or materials, excavators, concrete pumps, concrete saws, etc.) must be inspected before delivery to the site. The Contractor must obtain an inspection certificate signed by a mechanic and dated less than one (1) week before the arrival of each equipment on the site and store the inspection certificate on site; The Contractor will provide them to the Departmental Representative upon request.
- .7 Ensure that all inspections (daily, periodic, annual, etc.) of equipment for lifting persons or materials, required by the standards are achieved and be able to provide a copy of the inspection certificates upon request by the Departmental Representative.
- .8 The Departmental Representative may at any time, if he suspects a defect or safety hazard, order the immediate cessation of all equipment and require an inspection by an expert of his choice.
- .9 The Departmental Representative should be consulted for the location of gas cylinders and tanks on the site.

1.11 RISKS INHERENT TO THE WORKSITE

- .1 In addition to risks related to tasks to be performed, the personnel on site will be exposed to the following risks inherent to the place where the work will be performed. The Contractor shall include these elements in its prevention program, without limitation.

At the location of the work, there is the presence of:

- .1 Hazardous materials.
- .2 Underground utilities (electricity, gas, steam, water, etc.).
- .3 Laboratories.
- .4 Trees and landscaping to conserve and protect.
- .5 Potentially unstable soils.
- .6 Barbed wire fences.

1.12 INCIDENTAL RISKS/HASARDS

- .1 When a source of danger not specified in the contract documents and not identifiable during the preliminary inspection of the site appears out of or during the performance of work, the Contractor shall immediately stop the work, notify the person responsible for the health and safety on site, set up temporary protective measures for the workers and the public and informs the Departmental Representative, both verbally and in writing. The Contractor shall thereafter make the necessary changes to the program to prevent and implement the necessary security measures so that work can resume.

1.13 PERSON RESPONSABLE FOR HEALTH AND SAFETY

- .1 If the site conditions meet the criteria in section 2.5.3 of the *Safety Code for the construction work* (S-2.1, r 4), the Contractor must hire a competent and authorized person as security officer, and assign that person full-time from the beginning of the work. The duties of this person should be dedicated exclusively to the management of health and safety on the site. The security officer must meet the following criteria:
 - .1 Hold a security officer certificate issued by the CNESST.

- .2 Have practical experience at a construction site where related activities similar to the project were performed.
- .3 Have a working knowledge of the regulations on health and safety in the workplace.
- .4 Take responsibility for the Entrepreneur's on-site health and safety training sessions, and ensure that only persons who have successfully completed the required training have access to the site to perform the work.
- .5 Take responsibility for the implementation, respect in every detail and monitoring of the Health and Safety Plan prepared for the worksite by the Contractor.
- .6 Be present at all times on site during the performance of work.
- .7 Inspect the work and ensure compliance with all regulatory requirements and those indicated in the contract documents or the prevention program.
- .8 Keep a daily record of his actions and send a copy to the Departmental Representative at least once a week.

The certificate of the safety officer must be sent to the Departmental Representative before the work begins.

- .2 When hiring a security officer is not required or when the agent is hired by the Departmental Representative, the Contractor shall appoint a competent person as supervisor and responsible for health and safety and that, no matter the size of the worksite or the number of workers present. This person must be present at all times on the worksite and must be able to take all necessary measures to ensure the health and safety of the people and property at work and in the immediate vicinity of the site that could be affected by the conduct of business. The Contractor must provide the name of this person to the Departmental Representative before the work begins.

1.14 DISPLAY OF DOCUMENTS

- .1 Ensure that documents, articles, ordinances and relevant notices are displayed prominently on the site, in accordance with the laws and regulations of the province and in consultation with the Departmental Representative.
- .2 At the minimum, the following information and documents must be posted in an easily accessible place for workers:
 - .1 Site opening notice.
 - .2 Identification of the General Contractor.
 - .3 Company policy on OSH.
 - .4 Specific prevention program at the site.
 - .5 Emergency plan.
 - .6 Minutes of meetings of the site committee.
 - .7 Names of representatives to the site committee.
 - .8 Name of rescuers.
 - .9 Intervention and correction reports issued by the CNESST.

1.15 INSPECTIONS AND ADJUSTMENTS IN CASE OF NON-COMPLIANCE

- .1 Inspect workplaces, complete the site inspection grid and submit to the Departmental Representative in accordance with article « SUBMITTALS » in the present section.
- .2 Take immediate measures to correct the situations deemed non-compliant observed during the inspections mentioned in the preceding paragraph or recognized by the competent authority or by the Departmental Representative or his agent.
- .3 Submit to the Departmental Representative a written report on measures taken to correct the situation in the event of non-compliance in health and safety.
- .4 The Contractor shall grant the security officer or, if no security officer, the person appointed to take care of health and safety, the necessary authority to order the stopping and resumption of work when he considers it necessary or desirable for reasons of health and safety. It will ensure that the health and safety of public and site personnel as well as environmental protection always have precedence on issues related to cost and schedule.
- .5 The Departmental Representative or his agent may order work to stop if the Contractor does not provide the necessary corrections regarding the conditions found non-compliant health and safety. Without limiting the scope of the previous articles, he may also at any time order the work stopped if, in his perception, there is a danger or a risk to the health or safety of the site personnel, the public or for the environment.

1.16 VIOLENCE PREVENTION

- .1 Health and safety management on construction sites of Public Works and Government Services Canada (PWGSC) includes the implementation of measures to protect the psychological health of all persons who access the site where the works are located. Thus, in addition to physical violence, verbal abuse, bullying and harassment are not tolerated at the site. Anyone who demonstrates such actions or behavior will be warned and/or may be removed from the site permanently by the Departmental Representative.

1.17 BLASTING

- .1 Blasting or other use of explosives are allowed only if the Departmental Representative submitted written instructions to this effect.
- .2 Perform blasting operations in accordance with Section 31 23 16.26 - Excavating in rock.
- .3 Any operation involving explosives must be under the immediate supervision of a qualified blaster.
- .4 Purchase, transportation, storage and use of explosives must comply with the federal and provincial laws:
 - .1 Canada: *Explosives Act* (E17), *Regulations on Explosives* (C.R.C. 599 CH.), Standard on storehouse for blasting explosives and detonators, *Act and Regulations on the transport of dangerous goods*.
 - .2 Quebec: *Explosives Act* (E-22), *Regulations on Explosives* (E-22, r.1), *Safety Code for the construction work* (S-2.1, r 4) *Regulations transportation of hazardous materials*.
- .5 The Contractor shall obtain all permits required under those laws and regulations and keep a copy readily available on site.

- .6 The Contractor shall facilitate the visit of the site and explosive storage and inspection of vehicles used to transport them to all government officials and police officers who have jurisdiction in explosives.

1.18 CARTRIDGE DEVICES

- .1 Only use cartridge devices with the written authorization of the Departmental Representative.
- .2 Anyone using a nail gun must hold a training certificate and meet all the requirements of *Safety Code for construction* (S-2.1, r. 4), section 7.
- .3 Any other cartridge device must be used according to manufacturer's instructions and applicable standards and regulations.

1.19 LOCKOUT PROCEDURES

- .1 When working on equipment powered by electricity or any other energy source, the Contractor must provide a general lockout procedure to the Departmental Representative and implement the process.
- .2 Supervisory personnel and all employees involved in work requiring lockout must be trained on lockout procedures given by a recognized organization; the Contractor must send the training certificates to the Departmental Representative.
- .3 Prior to the lockout of equipment at a busy site, the Contractor shall coordinate with the site representative if the energy source shut-down may affect the operations of the site or the occupants.
- .4 The Contractor shall identify a qualified person as being responsible for the lockout and must ensure that this person writes a lockout form for each equipment to be lockout. The lockout form must be sent to the Departmental Representative at least forty-eight (48) hours before work begins; the latter shall have the form verified by the site representative if the work takes place in an existing building. The lockout form shall include at least the following information:
 - .1 Description of the work to be performed.
 - .2 Identification, description and location of the circuit and/or equipment to lockout.
 - .3 Identification of sources of power that supply the equipment.
 - .4 Identification of each of the lockout points.
 - .5 Sequence of lockout and of release of the residual energy and Unlocking sequence.
 - .6 Required lockout equipment list.
 - .7 Verification of zeroing energy method.
 - .8 Name and signature of the person who wrote the form.
- .5 Upon request by the Departmental Representative, the Contractor shall record all this information on the site representative's form.
- .6 At the time of the lockout, the person responsible will date the form and ensure that each worker involved in the work on the circuit/equipment locked puts his name on the form and signs it.

1.20 EXPOSURE TO SILICA

- .1 For indoor or outdoor work generating silica dust, the Contractor shall comply with the following requirements, in addition to meeting those of the *Safety Code for the construction*, S-2.1, r 4.
 - .1 Work wet or use tools with water supply to reduce dust, otherwise collect dust at source with a high efficiency filter and retain as to not spread the silica dust into the environment.
 - .2 Clean surfaces and tools with water, never with compressed air.
 - .3 Sand and strip the surfaces with an abrasive containing less than 1% silica (also known as amorphous silica).
 - .4 Install screens or partitions to prevent migration of dust outside the work area and protect other workers and the public.
 - .5 Wear respiratory protective equipment and eye protection during all operations likely to produce silica dust in accordance with the *Safety Code requirements for construction*, S-2.1, r 4.
 - .6 Wear a protective suit to prevent contamination outside the site.
 - .7 Do not eat, drink or smoke in a dusty area.
 - .8 Wash hands and face before eating, drinking or smoking

1.21 PREVENTION OF FALLS

- .1 Plan and organize work so as to promote the removal at source of the dangers of falls or collective protection and thus minimize the use of personal protective equipment. Where personal protection against fall is required, workers must use a safety harness in accordance with CAN - CSA Z-259.10 - M90. The seat belt should not be used as protection against falls.
- .2 All persons using a lifting platform (scissor, telescopic mast, mast articulated, rotating mast, etc.) should be trained for this purpose.
- .3 Wearing safety harness is compulsory in all lifting platforms telescopic mast, hinged or rotating.
- .4 Delineate a danger zone around each platform lift.
- .5 All opening in a floor or a roof must be surrounded by a guardrail or covered with a lid secured to the floor and resistant to loads to which it may be subjected to and, regardless of the dimensions of the opening and drop in height it represents.
- .6 Anyone working within two (2) meters of a place with a risk of falling three (3) meters or more must use a safety harness in accordance with the regulatory requirements, unless there is the presence of a guardrail or other element providing equivalent safety.
- .7 Despite the regulatory requirements, the Departmental Representative may require the installation of guardrails or the use of safety harness for certain situations at risk for falls of less than three (3) meters.

1.22 EXCAVATION WORKS

- .1 In addition to the *Safety Code for Construction* requirements for the construction work, the Contractor conducting trench digging or excavation must meet the following requirements:
 - .1 Complete the form below and send it to the Departmental Representative before the excavation work begins.
 - .2 Transmit to the Departmental Representative, as applicable, the following documents:
 - .1 Plans and specifications, signed and sealed by an engineer, for the shoring to implement for the excavation work; or
 - .2 Engineer notice specifying the angle of the walls of the trench or excavation.

Continued on next page.



Directive de creusage

N° _____ de _____

Cette directive de creusage est fournie à titre d'exemple par la Commission de la santé et de la sécurité du travail (CSST). On y trouve les principales indications que l'employeur devrait donner à la personne responsable des travaux sur le terrain et à l'opérateur de l'engin de terrassement.

Nom de l'entreprise	
Nom du projet	N° du projet
Adresse du chantier	Date du début des travaux

Repérage

Chainage ou axes : de _____ à _____ Plan annexé N° du plan : _____

Méthode de travail à utiliser

Tout en s'assurant que les parois ne présentent aucun danger de glissement de terrain,

- creuser et étançonner selon les plans et devis d'un ingénieur;
- creuser et étançonner en utilisant une boîte de tranchée;
- creuser sans étançonner pourvu que l'une des conditions suivantes soit respectée :
 - le roc est sain;
 - aucun travailleur ne descend dans la tranchée ou l'excavation;
 - les parois sont creusées conformément à l'avis d'un ingénieur.

Dimensions du creusement (Creuser selon le profil suivant.)

	Minimale	Maximale
H Profondeur		
Lf Largeur au fond		
Le Largeur en surface		

Mesures de sécurité

Déposer les matériaux à une distance d'au moins 1,2 mètre (4 pi) du sommet des parois.

Ne laisser aucun véhicule s'approcher à moins de 3 mètres (10 pi) du sommet des parois.

- Respecter le plan de l'ingénieur concernant les travaux à proximité d'une construction existante.
- Suivre le plan de localisation pour repérer les infrastructures souterraines.
- Installer le matériel de signalisation prévu par le plan de circulation (barrières, repères visuels, etc.).
- Affecter un ou des signaleurs au contrôle de la circulation.
- Respecter la méthode prévue pour le travail à proximité des lignes électriques.
- Mettre en place les dispositifs de protection des travailleurs, par exemple les glissières de sécurité en béton.

Nom	Fonction	
Signature	Date	N° de téléphone
Directive remise		
<input type="checkbox"/> au responsable des travaux sur le terrain <input type="checkbox"/> à l'opérateur de l'engin de terrassement		

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1.23 HOT WORK

Hot work means all work using an open flame or that can produce heat or sparks as the following work: riveting, welding, cutting, brazing, grinding, burning, heating, etc.

- .1 At the beginning of each shift and for each sector, the Contractor shall obtain a « Hot Work permit » issued by the site operator.
- .2 A functional portable fire extinguisher, and adequate to the risk of fire should be available and easily accessible within five (5) m from flames and sources of ignition or intense heat.
- .3 The Contractor shall designate a person to do continuous monitoring of fire for a minimum of one (1) hour after the end of each hot work. This person must sign the section of permit to this effect and return it to the person responsible for the site after the one (1) hour delay.
- .4 When hot work is carried out in areas where there are combustible materials or where the walls, ceilings and floors are made of or lined with combustible materials, a final inspection of the work area must be provided four (4) hours after the end of the work. Unless otherwise stated by the Departmental Representative, the Contractor shall appoint a person to carry out this inspection.

1.24 SUBORDINATION AGREEMENT IN OHS MATTERS

Project: _____ **Address:** _____

EXTERNAL CONTRACTOR

Hereby, I agree to commit to the authority of (name of general contractor) _____, which is the prime contractor for the project discussed above and, for the duration of our work on the site. Therefore, I confirm that I have read the prevention program of the General Contractor and I am committed to:

- inform my employees of the content of the prevention program of the General Contractor and ensure that its contents are respected at all times;
- provide a specific prevention program for our activities in the framework of this project;
- inform the General Contractor of my interventions on the site and to obtain his approval before the work;
- follow the health and safety guidelines given by the General Contractor's representative on the site and assist, as appropriate, to training activities and health and safety meetings organized.

Name of representative: _____

Name of Company: _____

Description of work to be performed on the site: _____

Approximate dates of works (beginning - end): _____

Signature: _____ Date: _____

GENERAL CONTRACTOR

Hereby, I agree to allow the company (name of the external contractor) _____ to work in the project indicated above and, as general contractor, to take the measures necessary to protect the health and safety of workers who are on the site. Should the contractor refuses or fails to comply with my repeated instructions, I commit to notify the Departmental Representative of PWGSC and provide documentary evidence of my interventions to the contractor.

Name of representative: _____

Name of General Contractor Company: _____

Signature: _____ Date: _____

Return the completed and signed copy to the Departmental Representative PWGSC.

END OF SECTION

Part 1 - GENERAL

1.1 REFERENCES

- .1 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 humankind; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

1.2 MEASUREMENT FOR PAYMENT

- .1 No measurement is related to the environmental protection. Costs related to these activities are subject to a lump sum price in the Unit Price Table.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative.
- .3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 The actions included in the environmental protection plan shall be submitted in a level of detail that is consistent with the environmental issues and with the construction work to be performed.
- .5 Environmental Protection Plan shall include:
 - .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 An Erosion and Sediment Control Plan indicating the measures implemented, including the monitoring and reporting requirements to ensure that control measures are in compliance with the federal, Provincial, and Municipal laws and regulations and with the requirements of document EPA 832 / R-92-005, chapter 3.
 - .6 The drawings showing the locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or soiled materials, including the drawings indicating the methods to control runoff and to confine materials on site.

- .7 The Traffic Control Measure Plan, including the measures to reduce erosion by traffic, of temporary roadbeds built, especially during wet weather. The plans shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- .8 Work area map showing the proposed activities in each area of the work zone and identifying the areas of limited use and the areas of prohibited use. Ensure the plan includes limit measures for marking areas of use and the methods for the protection of features to be preserved within the authorized work areas.
- .9 A Spill Contingency Plan including the procedures to be implemented, the instructions to follow and reports to be prepared in an unforeseen event of a spill of regulated substance.
- .10 A Non-Hazardous Solid Waste Disposal Plan identifying the methods and the locations for the solid waste disposal including the clearing of debris.
- .11 An Air Pollution Control Plan detailing provisions to ensure that dust, debris, materials, and trash, are contained on the project site.
- .12 A Contaminant Prevention Plan identifying potentially hazardous substances to be used on the worksite; the 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 the storage and handling of these materials.
- .13 A Waste Water Management Plan Identifying methods and procedures for the management and/or discharge of waste waters directly derived from building activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 A historical, archaeological, cultural and biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural and biological resources and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

1.4 FIRES

- .1 Fires and burning of waste on the site are prohibited.

1.5 DRAINAGE

- .1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes 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, requirements EPA 832/R-92-005, chapter 3.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 CLEARING THE SITE AND PLANT PROTECTION

- .1 Protect trees and plants on the site and adjacent properties as indicated.
- .2 Wrap in burlap, trees and shrubs adjacent to the construction work, storage areas and trucking lanes, and encase 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. 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 the Departmental Representative.

1.7 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Do not use waterway beds for borrow material without the Departmental Representative's approval.
- .3 Waterways are to be free of excavated fill, waste material and debris.
- .4 Design and construct culverts or other temporary crossing structures to minimize erosion to the waterways.
- .5 Do not skid logs or construction materials across waterways.

1.8 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features and implemented under the present Contract.
- .2 Control emissions from equipment and tooling in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures as instructed by the Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control on the temporary roads.

1.9 HISTORICAL/ARCHEOLOGICAL CONTROL

- .1 Provide 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 the project site: and/or identifies the procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction.
- .2 Plan includes methods to assure protection of known or discovered resources and identify lines of communication between the Contractor personnel and the Departmental Representative.

1.10 NON-COMPLIANCE NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Following the reception of such notice, the Contractor informs the Departmental Representative of the proposed corrective actions and implements the actions with the approval of the Departmental Representative.

- .1 Do not take action until after reception of a written approval by the Departmental Representative.
- .3 The Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments are allowed to the Contractor for such suspensions.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

3.1 CLEAN-UP

- .1 Perform clean-up in accordance with Section 01 74 11 – Clean-up.

FIN DE LA SECTION

Part 1 GENERAL

1.1 OBJECTIVES

- .1 Provide information to enable the Contractor to establish and maintain the quality control on the construction site through a quality management plan (QMP) incorporating all the construction activities of the project.

1.2 DEFINITIONS

- .1 Quality Assurance (QA): All activities planned within a quality system to ensure that the quality requirements for a product or service are indeed controlled.
- .2 Quality Control (QC): A set of observations and activities required to meet quality requirements.

1.3 INTRODUCTION

- .1 The Contractor is responsible to perform the quality control (QC).
- .2 The Contractor is responsible to build in compliance with the quality criteria indicated in the plans, specifications, permits and industry standards.
- .3 The Contractor has the obligation to ensure that all of his work meets the quality requirements mentioned in the plans, specifications, permits and industry standards. The purpose of the Contractor's quality management plan (QMP) is to assist in the realization of this obligation and provide the Departmental Representative with a means of confirming that the specified quality level is reached.
- .4 The Contractor must ensure a uniform and high level of manufacturing quality in all phases of procurement, fabrication, construction, installation and implementation of the works.
- .5 The Departmental Representative is responsible for the quality assurance (QA). The QA activities of the Departmental Representative do not release the Contractor from its obligations and responsibilities under the quality control requirements of the contract.

1.4 SCOPE OF QUALITY MANAGEMENT PLAN (QMP)

- .1 Establish and maintain a QMP as described in the present section. The QMP is the key element in determining the quality level required under the conditions of this contract and is composed of the following:
 - .1 QC organization.
 - .2 QC procedures.
 - .3 Coordination Plan at the kick-off site meeting.
 - .4 QC meeting.
 - .5 The three (3) control phases (described in the present section).
 - .6 Proposal, review and approval.
 - .7 Testing to be performed.

- .8 Inspections and certifications.
- .9 Checklist.
- .2 The QMP shall include without limitation: shop drawings, samples, testing and the different sections of the present specification.
- .3 The QMP must cover all work on and off-site and will be adapted to the sequence of the work.
- .4 The QMP must be approved by the Departmental Representative before beginning the work. The Departmental Representative reserves the right to require changes in the QMP if required.
- .5 The only activities allowed before the acceptance of the QMP are surveying and mobilization of site offices, equipment and materials.
- .6 Inform the Departmental Representative in writing of any changes proposed in the QMP or QC staff a minimum of ten (10) working days before the entry into force of the proposed amendment. The proposed changes are subject to the acceptance of the Departmental Representative.
- .7 The quality management plan (QMP) is separated into three control phases defined as follows:
 - .1 QMP Quality Planning.
 - .2 QMP Quality Control.
 - .3 QMP Quality Assurance.
- .8 Coordination of the three (3) control phases is the responsibility of the Contractor's QC manager.

1.5 QMP : PLANNING FOR QUALITY

- .1 Develop, organize and implement, if required, procedures and instructions to describe how the quality assurance will be performed.
- .2 Must meet all of the contractual specifications, the schedule and the applicable standards and codes requirements.
- .3 Maintain an effective system for the verification and validation of shop drawings.
- .4 Achieve the revised "As Built" drawings by ensuring that they meet the requirements of the contract.
- .5 Establish an inspection report system (in list form) that demonstrates and confirms that all items have been inspected. Compile the results accurately; join the test certificates and other required documents.
- .6 Provide specialized inspection by an independent firm for work with a high level of risk.
- .7 Maintain procedures and records that verify and confirm that the purchased materials meet the specified standards.

- .8 Develop a procedure for reporting deficiencies to identify nonconformities. The procedure should include a verification process to correct non-conformities and reactivate the inspection process. All non-compliance reports must be provided daily to the Contractor's superintendent and the Departmental Representative.
- .9 The QMP must be submitted to the Departmental Representative for review and comment prior to the commissioning and installation of each component of the work.
- .10 Prepare and submit reports on the overall progress in connection with the QMP on a weekly basis. QMP weekly report must cover all aspects of the plan and identify progress for the current week and plan activities for the next week. Send these reports to the Departmental Representative and the Contractor's superintendent.

1.6 QMP : QUALITY CONTROL

- .1 Quality control is the part of the QMP which focuses on the quality requirements of the project. The control consists in the process and procedures to ensure the quality of the work performed by the Contractor.
- .2 Once the QMP is prepared and approved for each segment of the work, complete and document the following:
 - .1 Verify that the materials and/or equipment comply with the shop drawings, technical specifications and approved samples.
 - .2 Verify that the equipment and manpower to do the work are suitable and qualified.
 - .3 Verify that the work has been prepared according to the rules of good practice, the manufacturers' recommendations/instructions and the contract documents.
 - .4 Initial verification of all materials/equipment must be performed by qualified personnel.
 - .5 At any point in the process, if there is a presence of non-compliance, stop the work and produce a deficiency report. Once the non-compliance is corrected, repeat the quality control process from the beginning.
 - .6 Once the report for all project components is completed, authenticate and transmit to the Departmental Representative.

1.7 QMP : QUALITY ASSURANCE

- .1 The quality assurance segment of the QMP focuses on verifying that the requirements for the quality control of the project and that the performance criteria have been achieved. It ensures that the processes and procedures to ensure product quality and workmanship are well established and understood by the Contractor.
- .2 The coordination between the quality assurance processes of the Departmental Representative is the responsibility of the QA specialist of the Contractor.

1.8 INSPECTION

- .1 The Departmental Representative must have access to the structures. If parts of the work or works are performed outside of the site, access to this location must also be assured for the duration of the work.

- .2 In case of works that must be subject to inspections, approvals or special testing ordered by the Departmental Representative or required under local regulations to the site, make the request within a reasonable time period.
- .3 If the Contractor has backfilled or allowed to backfill a structure before it was submitted to inspections, approvals or required special testing, he must excavate the structure in question, see to the performance of inspections or tests required to satisfy the competent authorities then put the structure in its original state.
- .4 The Departmental Representative may order the inspection of any part of the structure to which the conformity with the contract documents is in doubt. If, after review, the structure in question does not comply with the requirements of the contract documents, the Contractor shall take the necessary measures to ensure the structure conforms to the specified requirements, and cover the inspection and repair costs. If the structure in question is found to comply with the contract documents, the Departmental Representative will cover the costs of the inspection and rehabilitation so incurred.
- .5 The Departmental Representative reserves the right to audit the performance of the QMP and related documentation and facilities to verify the compliance of the work.

1.9 INDEPENDANT TESTING AND INSPECTION ORGANIZATIONS

- .1 The Departmental Representative will be responsible to retain the test organisms and independent inspection services. The cost of these services will be borne by the Departmental Representative.
- .2 Provide materials required by the bodies designated to carrying out the tests and inspections.
- .3 The use of testing and inspection bodies does not relieve the Contractor from its responsibility for the execution of works according to the requirements of the contract documents.
- .4 If defects are identified during testing and/or inspections, the designated agency will require further inspection and/or additional tests to accurately define the nature and extent of these defects. The Contractor shall correct the defects and imperfections according to the Departmental Representative's guidelines, at no additional cost to the Departmental Representative, and assume the cost of tests and inspections that should be performed after these corrections.
- .5 Testing organizations and independent inspection services will be responsible for carrying out the quality control tests. Tests will be carried out, without limitation, on the following elements:
 - .1 Volume control of material and grading;
 - .2 Soils, topsoil, turf and hydroseeding;
 - .3 Pavement;
 - .4 Concrete;
 - .5 Surface marking.
- .6 The Departmental Representative may choose to arrange and pay for quality assurance testing beyond the QMP activities of the Contractor and examine all work under this contract. The Contractor shall allow access to the site as necessary to permit these tests.

1.10 SITE ACCESS

- .1 Enable testing and inspection organizations to have access to the work site as well as the workshops for the manufacturing and shaping located outside the site.
- .2 Working with these organizations and take all reasonable measures so that they have the necessary means of access.

1.11 PROCEDURE

- .1 Notify at least forty eight (48) hours in advance the appropriate testing and inspection organizations and the Departmental Representative when tests are carry out so that all parties may be present.
- .2 Submit samples and/or materials/ necessary equipment for the testing according to the requirements of the specifications, within a reasonable time and in a predetermined order so as not to delay the execution of the work.
- .3 Provide the labor and the necessary facilities for the collecting and handling of specimens and materials/equipment on the site. Also provide the space required for the storage and curing of samples.
- .4 Assist the Departmental Representative for him to get the samples for the quality assurance purposes.

1.12 REPORTS

- .1 Provide two (2) copies of the tests and inspections reports to the Departmental Representative.
- .2 Provide copies of these reports to sub-contractors responsible for the inspected or tested structures.

1.13 TESTING AND DOSAGE FORMULA

- .1 Submit the required test reports and dosage formulas.
- .2 The tests and dosage formulas which were not specifically required under the contractual documents or local regulations for the site will be subject to the approval of the Departmental Representative and may subsequently be reimbursed.

1.14 SAMPLES OF WORKS

- .1 Prepare the samples of works specifically required in the specifications. The requirements of the present section apply to all sections of the specifications under which it is asked to provide samples of works.
- .2 Construct samples of works at locations approved by the Departmental Representative.
- .3 Prepare samples of works for the approval by the Departmental Representative within a reasonable time and in a predetermined order, so as not to delay the execution of the work.

- .4 A delay in the preparation of samples of works cannot constitute a sufficient reason for an extension of time for completion of the work and no such request will be accepted.
- .5 If necessary, the Departmental Representative will help the Contractor establish a timetable for the preparation samples of samples of work.
- .6 Remove samples at the completion of the work or when instructed by the Departmental Representative.

1.15 PLANT TRIALS

- .1 Submit the certificates of the factory performed tests that are prescribed in the various sections of the specifications.

1.16 MATERIALS, EQUIPMENTS AND SYSTEMS

- .1 Submit the mechanical and electrical systems' balancing reports.
- .2 Before the work begins, the Contractor must retain the services of a specialized inspector to inspect the paving factory that will be used by the Contractor's supplier. The inspector will make a first joint visit with the Departmental Representative and review the entire paving manufacturing process to be used for this mandate. Following this first visit, the inspector appointed by the Contractor shall provide the Contractor and the Departmental Representative with a written report summarizing his observations on the status of the various components of the plant and the manufacturing operations, warehousing and weighing of the paving. The report will also contain the recommendations deemed necessary to ensure maximum consistency in the quality of the paving mixture and continuity in the production for the duration of the contract. Here is a list of checks that need to be made by the Inspector appointed by the contractor:
 - .1 Status of the bitumen and calibration pumps;
 - .2 Flange condition;
 - .3 Elevator condition;
 - .4 Burner system condition;
 - .5 Silos sealing;
 - .6 Thermometers' calibration;
 - .7 Results of the testing on samples taken during the 2015 and 2016 seasons;
 - .8 Plant compliance certificate;
 - .9 History maintenance and calibrations performed during the last two (2) years.
- .3 At the joint visit, the inspector shall conduct any verification deemed relevant by the Departmental Representative.

- .4 Following receipt of the report from the inspector, the Contractor shall proceed with the implementation of all the inspector's recommendations and must send a copy of the report to the Departmental Representative. The Contractor shall notify the Departmental Representative and his inspector when the upgrade of the plant is completed. A second joint visit will take place at the plant to see the improvements that have been made and the test the results obtained on the mixtures, in the last two months. The Contractor shall demonstrate that its plant is in good condition and that all measures have been taken to manufacture a mix of consistent quality and the risk of breakage is minimized given the good condition of the plant. A maintenance plan must be prepared by the Contractor and submitted to the Departmental Representative.
- .5 The upgrade of the plant is subject to no item on the Pay Items Table. The Contractor shall allocate costs across its unit price.

Part 2 PRODUCTS

- .1 Not used.

Part 3 EXECUTION

3.1 QUALITY CONTROL ORGANIZATION

- .1 Quality control manager (QM)
 - .1 The QM will implement and manage the Contractor's QMP. No construction work or testing may be performed unless the QM is present on the work site.
 - .2 The QM is required to attend project kick off meetings, QMP Meetings, Coordination and Mutual Understanding Meeting, conduct the QMP Meetings, perform the three phases of control, perform submittal review and approval, confirm testing is performed and provide QC certifications and documentation required in this Contract. The QM is responsible for managing and coordinating the three phases of control and documentation performed by the QC Specialists, testing laboratory personnel and any other inspection and testing personnel required by this Contract. The QM is the manager of all QC activities.
 - .3 The individual must be familiar with the requirements and have experience in the areas of hazard identification and safety compliance.
 - .4 The QM is responsible to collect, coordinate and compile the elements of the QMP that will be executed by the Contractor and his sub-contractors.
 - .5 The QM is responsible to manage the performance of the sub-contractors and ensure adherence to the QMP. In addition, the QM will perform quality audits on those portions of the QMP that are executed by sub-contractors and report on their compliance as part of the QMP Reporting to the Departmental Representative.

3.2 QUALITY MANAGEMENT PLAN (QMP)

- .1 Provide, for acceptance by the Departmental Representative, a Construction QMP submitted in a three-ring binder that includes a table of contents, with major sections identified with tables, with pages numbered sequentially, and that documents the proposed method and responsibilities for accomplishing commissioning activities during the construction of the project: The QMP shall include the following :
 - .1 QC Organization: A chart showing the QC organizational structure.
 - .2 Names and Qualifications: Names and qualifications, in resume format, for each person in the QC organization.
 - .3 Duties, Responsibility and Authority of QMP Personnel: Duties, responsibilities, and authorities of each person in the QC organization.
 - .4 Outside Organizations: A listing of outside organizations, such as consulting engineering firms, QC testing firms and laboratories which will be employed by the Contractor and a description of the services these firms will provide.
 - .5 Appointment Letters: Letters signed by an officer of the firm appointing the QM and stating that they are responsible for implementing and managing the QC Program as described in the Contract. Include in letters the responsibilities of the QM to implement and manage the three phases of control, and their authority to stop Work which is not in compliance with the Contract. Letters of direction are to be issued by the QM to all other QC Specialists outlining their duties, authorities, and responsibilities. Include copies of the letters in the QC Plan.
 - .6 Submittal Procedures and Initial Submittal Register: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.
 - .7 Testing Laboratory Information: Testing laboratory certification and description of investigative responsibilities to be implemented.
 - .8 Testing Plan and Log: A testing plan and log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.
 - .9 Procedures to Complete Rework Items: Procedures to identify, record, track, and complete rework items.
 - .10 Documentation Procedures:
 - .1 List of Definable Activities: A definable activity (DA) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task. A DA is identified by different trades or disciplines and is an item or activity on the construction schedule. Include in the list of DAs, but not be limited to, all critical path activities. Include all activities for which this specification required QC specialists or specialty inspection personnel.
 - .2 Procedures for Performing the Three Phases of Control: Identify procedures used to ensure the three phases of control to manage the quality on this project. For each DA, a Preparatory and Initial Phase checklist will be filled out during the Preparatory and Initial Phase meetings. Conduct the Preparatory and Initial Phases and meetings with a view toward obtaining quality construction by planning ahead and identifying potential problems for each DA.

- .3 Checklists: Checklists must be created for each DA. The input for the checklists must be extracted from the contract documents, and the industry and DND standards referenced therein. These checklists will form the backbone of the QMP documentation.

3.3 COORDINATION AND MUTUAL UNDERSTANDING MEETING

- .1 Prior to submission of the QMP, the QM will meet with the Departmental Representative to discuss the QMP requirements of this Contract. The purpose of this meeting is to develop a mutual understanding of the QMP requirements prior to plan development and submission.
- .2 The purpose of this meeting is to develop a mutual understanding of the QMP details, including documentation, administration for on-site and off-site work, design intent, environmental requirements and procedures, coordination of activities to be performed, and the coordination of the Contractor's management, production and QMP personnel. At the meeting, the QM will be required to explain in detail how three phases of control will be implemented for each DA.
- .3 The QM will coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependent on each other for proper installation and operation.
- .4 As a minimum, the Contractor's personnel required to attend include the Project Manager, Project Superintendent, QM, and subcontractor representatives. Each Subcontractor who will be assigned QC responsibilities must have an authorized representative of the firm at the meeting. Minutes of the meeting will be prepared by the QM and signed by the Contractor and the Departmental Representative. Provide a copy of the signed minutes to all attendees and include in the QMP.
- .5 If a new QM is appointed, the Coordination and Mutual Understanding Meeting will be repeated.

3.4 PROGRESS REPORT OF THE QMP

- .1 After the start of construction, conduct weekly QMP progress report in conjunction with Departmental Representative Construction Progress Meeting. The Contractor QM will prepare the minutes of the progress report and provide a copy to the Departmental Representative within two (2) working days to include into the minutes of the Construction Progress meeting. As a minimum, accomplish the following at each meeting:
 - .1 Review the minutes of the previous reports.
 - .2 Review the schedule and the status of work and rework.
 - .3 Review the status of submittals.
 - .4 Review the Work to be accomplished in the next two (2) weeks and the related documentation required.
 - .5 Resolve QC and construction problems.
 - .6 Address the items that may require revising the QMP.

3.5 THREE PHASES OF CONTROL

- .1 The Three Phases of Control are: Quality Planning, Quality Control and Quality Assurance. The Quality Planning Phase is intended to ensure that the Contractor reviews, verifies and is effectively prepared to execute the work. The Quality Control Phase is intended to ensure that the Contractor initiates and executes the work in accordance with the Contract requirements. The Quality Assurance Phase is intended to ensure that all work, testing and documentation are complete and compliant. QM will cover both on-site and off-site work with the Three Phases of Control.
- .2 Quality Planning Phase: QMP progress report will be conducted by the QM and attended by the subcontractor QC personnel, the Project Superintendents and the CM. When a DA is performed by a subcontractor, that subcontractor's foreman shall attend the planning phase meeting. Document the results of the planning phase actions in the daily contractor QMP report and in the Planning Phase checklist. Perform the following prior to beginning Work on each DA:
 - .1 Review each paragraph of the applicable specification sections and extract metrics from the technical specifications and the referenced standards.
 - .2 Assemble the metrics into comprehensive checklists for use for each time a DA is executed.
 - .3 Review the Contract drawings.
 - .4 Ensure that field measurements are as indicated on construction and/or shop drawings before confirming product orders.
 - .5 Ensure that appropriate shop drawings and submittals for material and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.
 - .6 Review the testing plan and ensure that provisions have been made to provide the required QC testing.
 - .7 Examine the work area to ensure that the required preliminary work has been completed.
 - .8 Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
 - .9 Arrange for the return of shipping/packaging materials, such as wood pallets, where economically feasible.
 - .10 Ensure that the required materials, equipment and sample work are on hand and conform to the approved shop drawings and submitted data.
 - .11 Discuss specific controls and construction methods used, construction tolerance, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DA.
 - .12 Review and verify that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.
 - .13 Complete applicable compliance checklists.

- .3 Quality Control Phase: QM will notify the Departmental Representative at least two (2) work days in advance of each quality control phase. When construction crews are ready to start work on a DA, conduct the quality control phase with (the QC specialists) the project Superintendent, and the foreman responsible for that DA. Observe the initial segment of the DA to ensure that the work complies with the Contract requirements. Document the results of the initial phase in the weekly QC Report and in the quality control phase checklists. Repeat the quality control phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DA:
 - .1 Establish the quality of workmanship required.
 - .2 Resolve conflicts.
 - .3 Confirm testing is performed by the approved laboratory.
 - .4 Check to confirm all applicable safety requirements are met.
 - .5 Provide complete applicable checklists for each DA.
- .4 Quality Assurance Phase: QM will verify with the Departmental Representative that QA has correlated QC results as frequently as necessary, until the completion of each DA and document in the daily QMP Report:
 - .1 Confirm work is in compliance with Contract requirements.
 - .2 Maintain the quality of workmanship required.
 - .3 Confirm testing is performed by the approved laboratory.
 - .4 Confirm rework items are being corrected, if required.
 - .5 Confirm the manufacturers' representatives have performed the necessary inspections on products delivered and to ensure safety.
 - .6 Confirm that the quality checklists for each DA is completed and filed.
- .5 Continuous Improvement: QM will conduct additional quality planning and quality control phases on the same DA if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if the Work on a DA is resumed after substantial period of inactivity, or if other problems develop.
- .6 Incorporate any 'lessons learned' or modifications into the QMP identified as a result of the Continuous Improvement as part of the Quality Assurance Phase.

3.6 QC TESTING

- .1 Except as stated otherwise in the specification sections, perform sampling and testing under this Contract.
- .2 Construction materials testing must be provided by an accredited laboratory and will be required to submit a copy of the Certification of Accreditation and Scope of Accreditation. The policy applies to the specific laboratory performing the actual testing, not just the Corporate office.
- .3 The Departmental Representative retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in the contract.

- .4 QM will cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Departmental Representative immediately.
 - .1 Conspicuously stamp the cover sheet for each report in large red letters.
 - .2 Provide the Departmental Representative with a proposed remedial action plan to correct failure instances within twenty four (24) hours.
- .5 The QM will provide the signed reports and certifications of field tests at the end of each work day to the Departmental Representative. Attach a copy of the summary report summarizing submissions to the weekly Contractor QMP report.

3.7 DOCUMENTATION

- .1 The QM will maintain current and complete records of on-site and off-site QMP operations and activities.
- .2 The reports are required for each day that Work is performed and must be attached to the QMP weekly report. Account for each calendar day throughout the life of the contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The Project Superintendent and the QM must prepare and sign the QMP Reports which are to be submitted weekly. The reporting of Work must be identified by terminology consistent with the construction schedule. Include in the reports pertinent information such as directions received, problems encountered during construction, work progress, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instruction given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QMP, construction deficiencies encountered, meetings held. For each entry in the report(s), identify the schedule DA that is associated with the entered remark.
- .3 The QM will establish and maintain the following in a series of three ring binders. Divide and tab the binders as shown below. These binders must be readily available to the Departmental Representative during all business hours and must contain the following:
 - .1 All completed Quality Planning, Control and Assurance Phase Checklists, arranged by specification section.
 - .2 All milestone inspections, arranged by the DA.
 - .3 An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.
 - .4 Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
 - .5 An up-to-date copy of the Rework Items List.
- .4 Reports are required for each day that work is performed in their area of responsibility. QC Specialist or subcontractor reports must include the same documentation requirements as the QMP Report for their area of responsibility. These reports are to be prepared, signed and dated by the QC Specialists or subcontractor and attached to the weekly QMP report.
- .5 As tests are performed on site the QM will report and record on their results.

- .6 The QM must maintain a list of work that does not comply with the Contract, identifying what items need to be reworked, the date the non-compliance of the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Attach an updated copy of the list to the weekly QMP Report.
- .7 The QM is required to ensure that « as-built » drawings are kept current on a daily basis.

END OF SECTION

Part 1 - GENERAL

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel Association canadienne de normalisation (CSA International).
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-08, Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987 (R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96 (C2006), Signs and Symbols for the Occupational Environment.
- .3 Travaux publics et Services gouvernementaux Canada (TPSGC), Guide des clauses et conditions uniformisées d'achat (CCUA) - ID : R0202D, Titre: Conditions générales C, en vigueur depuis le 14 mai 2004.
- .4 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA-832-R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL OF EQUIPMENT

- .1 Prepare a site plan showing the proposed location and dimensions of the area which must be fenced and used by the Contractor, the number of required construction trailers, the access routes to the fenced area and details of installation of the fence.
- .2 Provide a trailer for the Contractor and a trailer for the Departmental Representative. The trailers must be electrically powered.
- .3 Identify areas which have to be gravelled to prevent tracking of mud.
- .4 Indicate use of supplemental or other staging area.
- .5 Provide construction facilities in order to execute the work expeditiously.
- .6 Remove from site all such work after use.

1.4 HOISTING

- .1 Provide, operate and maintain hoists cranes required the movement of workers, materials and equipment. Make financial arrangements with the Subcontractors for their use of hoists.
- .2 Hoists cranes to be operated by qualified operator.

1.5 SITE STORAGE/LOADING

- .1 Ensure that the work is performed within the limits indicated in the contract documents. Do not unreasonably encumber the premises with materials and equipment.
- .2 Do not load or permit to load any part of the structure with weight or force that will endanger its integrity.
- .3 Ensure that no stack of materials interfere with the airport operations.

1.6 ACCESS ROADS

- .1 If necessary, arrange for suitable access routes to the site and provide maintenance for them.
- .2 If it is permitted to use the existing roads to access the site, provide maintenance for the duration of the work and, if necessary, repair any damage that may have been caused.
- .3 Clean runways and taxiways that have been used by the vehicles of the Contractor during the construction work.
- .4 The Contractor shall avoid as much as possible to travel in the wheels' touchdown zone of a closed runway for the transport of materials.

1.7 CONSTRUCTION PARKING

- .1 Parking will be permitted on site provided it does not disrupt the performance of work.
- .2 Clean runways and taxi areas where they were used by the Contractor's equipment.

1.8 SECURITY

- .1 Provide and pay for reliable security personnel to guard the site and the materials/equipment it contains, after working hours and during holidays.
- .2 Provide proper lighting of worksite for work done during the night.

1.9 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide 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 Departmental Representative's Site office.
 - .1 Provide temporary office for Departmental Representative, isolated from the Contractor's office.
 - .2 Inside dimensions minimum 5 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 Furnish the office with 1 m x 2 m table, 4 chairs, three 1 m x 2 m desks, 300 mm wide shelving, totaling a length of 6 m, a three-drawer filing cabinet, one plan rack and a clothes rack with shelf.
- .8 Maintain in clean condition.

1.10 EQUIPMENT, TOOL AND MATERIAL STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for the storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause the least interference with the work activities.

1.11 SANITARY FACILITIES

- .1 Provide sanitary facilities for the work force in accordance with the governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.12 WORKSITE SIGNAGE

- .1 Within three (3) weeks after signing the contract, provide a worksite signage panel and install it at the location designated by the Departmental Representative.
- .2 The panel shall measure 1.2 m x 2.4 m, be made of plywood with wood framing and bear an inscription made by a lettering artist.
- .3 The Departmental Representative will provide the adhesive film to affix to the project identification sign.
- .4 Except for the warning signs, no other panel or other postings can be installed on site.

1.13 ELECTRICAL

- .1 For all the duration of the work, provide temporary electrical power, and cover the costs and maintenance in accordance to the rules and regulations in place.

1.14 WATER SUPPLY

- .1 For all the duration of the work, provide temporary water supply, and cover the costs and maintenance in accordance to the rules and regulations in place.

1.15 DRAINAGE

- .1 Refer to section 01 35 43 – Environmental procedures regarding the requirements for dewatering and drainage of the site.

1.16 REMOVAL OF TEMPORARY FACILITIES

- .1 No storage is permitted at the site installations.
- .2 Remove from site all temporary facilities when the Departmental Representative deems it appropriate.

- .3 Establish temporary means to fight against erosion and sediment deposition, to prevent soil loss that may result from storm water runoff or erosion by the wind, and movement of the soil on adjacent properties and pedestrian pathways. Such means shall comply with the requirements of Section 01 35 43 - Environmental Protection.
- .4 Inspect control methods implemented, ensure maintenance and repair as required until the permanent vegetation has been established.
- .5 Remove the control methods at the right time and restore and stabilize areas disturbed during the work.

1.17 CLEANUP

- .1 Refer to section 01 74 11 – Cleanup.

1.18 TERMS OF PAYMENT

- .1 The cost of the site installations will be included in the lump sum amount for site organization in the Paid Items Table.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 REFERENCES

- .1 Conform to the above reference standards, in whole or in part as specifically requested in the specifications.
- .2 If there is question as to whether products or systems are in accordance with applicable standards, the Departmental Representative reserves the right to have such products or systems tested to prove or disprove conformity.
- .3 Cost for such testing will be born by the Departmental Representative in the event of conformity with Contract Documents or by the Contractor in event of non-conformity.

1.2 QUALITY

- .1 Products, materials, equipment and parts used for the execution of work shall be new, not damaged or defective, and of the best quality for the purpose intended. If requested, provide proof confirming the type, source and quality of the products provided.
- .2 Defective products, whenever identified prior to the completion of the work, will be rejected, regardless of the previous inspections. Inspections are not intended to relieve the Contractor of its responsibility, but is a precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by the reject.
- .3 Should disputes arise as to the quality or fitness of products, decision rests strictly with the Departmental Representative based upon requirements of the Contract Documents.
- .4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or similar item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 AVAILABILITY

- .1 Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify the Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the work.
- .2 In the event of failure to notify the Departmental Representative of foreseeable supply delays for items at the commencement of work and should it subsequently appear that the work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in the Contract Price.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, alteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store the products in their original packaging or bundled with the manufacturer's seal and labels intact. Do not remove from packaging or bundling until required by the work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Place the timber and sheet materials, panels on rigid supports, flatly, so they do not rest directly on the ground. Allow a slight slope to facilitate the flow of condensation water.
- .5 Store and mix paint products in a warm and well ventilated area. Every day, remove oily rags and other flammable waste from the workplaces. Take all the necessary precautions to avoid the risk of spontaneous combustion.
- .6 Remove and replace damaged products at own expense and to the satisfaction of the Departmental Representative.

1.5 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of the work.
- .2 Transportation costs of products supplied by the Owner will be paid for by the Departmental Representative. Provide the unloading, handling and storage of such products.

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Sauf prescription contraire dans le devis, installer ou mettre en place les produits selon les directives du fabricant. Ne pas se fier aux indications inscrites sur les étiquettes et les contenants fournis avec les produits. Obtenir directement du fabricant un exemplaire de ses directives écrites.
- .2 Aviser par écrit le représentant du Ministère de toute divergence entre les exigences du devis et les directives du fabricant, de manière qu'il puisse prendre les mesures appropriées.
- .3 If the manufacturer's instructions have not been followed, the Departmental Representative may require, without increase to the contract price, the removal and installation of the products that have been implemented or installed incorrectly.

1.7 QUALITY OF WORK

- .1 The implementation must be of the highest possible quality, and the work must be performed by skilled workers, each skilled in their respective disciplines. Notify the Departmental Representative if the work to be performed are such that they will likely not allow to obtain the desired results.
- .2 Do not hire unqualified people or not having the necessary skill to carry out the work entrusted to them. The Departmental Representative reserves the right to prohibit access to the site to any person deemed incompetent or negligent.

- .3 Decisions as to the standard or fitness of the Quality of Work in cases of dispute rest solely with the Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure that workers cooperate among themselves to the realization of the work. Exercise close and constant supervision of their work.
- .2 The Contractor is responsible for ensuring the coordination of the work and the implementation of bushings, sleeves and accessories.

1.9 REMEDIAL WORK

- .1 Remedial work required to repair or replace parts or elements of the work identified as defective or unacceptable. Coordinate the work to be performed on the affected adjacent structure, as required.
- .2 Remedial work must be done by specialists familiar with the materials and equipment used; the work must be done so that no part of the structure is damaged or is likely to be.

1.10 EXISTING UTILITIES

- .1 When it comes to making connections to existing networks, execute the work at the hours established by the competent local authorities in order to minimizing interference with the work flow and/or the building occupants and pedestrians and cars movement.
- .2 Protect, move or keep in service the utility pipes that are functional. If abandoned pipes are discovered during the construction, cap off in a manner approved by the responsible authorities, identify shut-off point and record.

Part 2 - PRODUCTS

- .1 Not used.

Part 3 - EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.2 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment will be made within the survey work, with the exception of survey markers to be replaced.
- .2 Measure the geodetic markers effectively replaced by a land surveyor in units.

1.3 QUALIFICATIONS OF SURVEYOR

- .1 Qualified surveyor/land surveyor, member of the Quebec Order of surveyors to carry out the implementation of the new geodetic reference benchmark.
- .2 Qualified registered land surveyor, licensed to practice in Quebec, acceptable to the Departmental Representative for all survey related works.

1.4 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated in the drawings
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during the construction
- .3 Geodetic marks # M0323004 and # M0323066 identified in the plans shall be replaced by new ones which will be adjusted at the asphalt allowance. The new survey markers must be of the same category as those they replace. The land surveyor must make the necessary observations and transmit the data to the Department of Geodetic Department of Natural Resources and Wildlife for the integration of the new benchmark. The Contractor shall obtain validation of the position of the new geodetic reference by the Departmental Representative.
- .4 The Contractor must hire a registered surveyor to update the reference point record, in accordance with the requirements from the MRNQ (ministère des Ressources naturelles du Québec).
- .5 Require surveyor to replace control points in accordance with original survey control.

1.5 SURVEY REQUIREMENTS

- .1 Establish two (2) permanent benchmarks on the site, based on benchmarks already established based on control points. Record their location by entering their horizontal and vertical coordinates in the project documents folder.
- .2 Establish lines and levels, determine locations and implant, using instrumentations.
- .3 Stake the site for grading and the establishment of fill material.
- .4 Stake slopes.
- .5 Establish pipe invert elevations.
- .6 Establish lines and levels for electrical systems and installations.

1.6 EXISTING UTILITIES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within two (2) metres of the structures. Cap or otherwise seal the lines left in place at cut-off points, as directed by the Departmental Representative

1.7 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with the manufacturer's recommendations for safety, access and maintenance.
- .3 Inform the Departmental Representative of impending installation and obtain approval for their actual location.
- .4 Submit field drawings to indicate the relative position of the various services and equipment when required by the Departmental Representative.

1.8 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Upon completion of the foundations and major site improvements, prepare a certified survey showing the dimensions, locations, angles and elevations of the work.
- .3 Record the locations of maintained, re-routed and abandoned service lines.

1.9 SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 Upon request of the Departmental Representative, submit the documentation and samples required to verify the accuracy of the field engineering work
- .3 Submit a certificate signed by the surveyor, noting and certifying that the elevations and locations of the completed work, whether they comply or not with the Contract Documents, are accurate.

1.10 SUBSURFACE CONDITIONS

- .1 Promptly notify the Departmental Representative in writing if subsurface conditions at place of work differ materially from those indicated in the Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should the Departmental Representative determine that conditions do differ from the indicated or anticipated conditions, instructions will be issued for the revision of the work to be performed under change orders submitted.

Part 2 – PRODUCTS

.1 Not used.

Part 3 – EXECUTION

.1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 PROJECT CLEANLINESS

- .1 Maintain the worksite in tidy condition, free from accumulation of waste products and debris, including that caused by the Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Departmental Representative. Do not burn waste materials on site, unless approved by the Departmental Representative.
- .3 The Contractor shall maintain, on site, and for the duration of the work, the necessary cleaning equipment to be able to maintain the operational surfaces (open to traffic) absent of debris or dust, and this, at all times.
- .4 Arrange and obtain the required permits from the competent authorities for the removal of debris and scrap materials.
- .5 Provide on-site containers for the disposal of debris and waste materials.
- .6 Provide and use, to recycling, separate and identified containers.
- .7 Store volatile waste in closed metal containers and evacuate from the site at the end of each work period.
- .8 Store equipment/materials recovered during demolition
- .9 Do not store new equipment/materials or salvaged equipment/materials on site installations.
- .10 Provide adequate ventilation during the use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by the manufacturer of surface to be cleaned, and as recommended by the cleaning material manufacturer.
- .12 Schedule cleaning operations so that the resulting dust, debris and other airborne contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

- .1 When work is substantially performed remove surplus products, tools, construction machinery and equipment not required for performance of the remaining work.
- .2 Remove waste products and debris other than that caused by others, and leave worksite clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by the Owner or other Contractors.

- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative. Do not burn waste materials on site, unless approved by the Departmental Representative.
- .6 Make arrangements with and obtain permits from the authorities having jurisdiction for the disposal of waste and debris.
- .7 Sweep and wash clean the paved areas.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling, according to section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

- .1 Not used.

Part 3 EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct a meeting with the Departmental Representative to review and discuss PWGSC's Waste Management Plan and Goals.
- .2 Accomplish maximum control of solid construction waste.
- .3 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based the on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from the project.
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material, designed to ensure their proper classification in the appropriate categories, at point of generation.
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for the purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using it in an altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Reuse: repeated use of product in same form but not necessarily for the same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before the demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to the vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from the moment they become waste.
- .13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Appendix A.

- .14 Waste Management Co-ordinator (WMC): Contractor representative responsible for the supervision of waste management activities as well as coordinating of related requirements for submittals, documents and reports.
- .15 Waste Reduction Workplan (WRW): written report which addresses the opportunities for reduction, reuse, or recycling of materials. Refer to Appendix B. WRW is based on the information acquired from the Waste Audit (Appendix A).

1.3 DOCUMENTS

- .1 Maintain at job site, one copy of following documents:
 - .1 Waste Reduction Workplan.
 - .2 Material Source Separation Plan.

1.4 SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit the following prior to the project start-up:
 - .1 Submit two (2) copies of completed Waste Reduction Workplan (WRW): Appendix B.
 - .2 Submit two (2) copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment, the summary of waste materials salvaged for reuse, recycling or disposal by using the project deconstruction/disassembly material audit form.
 - .1 Failure to submit could result in hold back of final payment.
 - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
 - .3 For each material reused, sold or recycled from the project, include amount in tonnes, quantities by number, type and size of items and the destination.
 - .4 For each material land filled or incinerated from the project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare WRW prior to project start-up.
- .2 WRW should include but not be limited to:
 - .1 Destination of waste materials listed.
 - .2 Deconstruction/disassembly techniques and sequencing.
 - .3 Schedule for deconstruction/disassembly work.
 - .4 Location.
 - .5 Security measures.
 - .6 Protective measure.
 - .7 Clear labelling of storage areas.
 - .8 Details on waste material handling and removal procedures.
 - .9 Quantities for materials to be salvaged for reuse or recycled and for materials sent to landfill.

- .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .4 Describe the waste management method.
- .5 Post WRW or a summary where workers at the site are able to review the content.
- .6 Set realistic goals for waste reduction, identify existing constraints and develop strategies to eliminate them.
- .7 Monitor and report on waste reduction by documenting the total volume and cost of actual waste removed from the project.

1.6 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

- .1 Prepare MSSP and have it ready for use prior to project start-up.
- .2 Implement MSSP for all waste materials generated on the project in compliance with the methods reviewed and approved by the Departmental Representative.
- .3 Provide on-site facilities for the collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations to facilitate the deposit of materials without hindering daily worksite operations.
- .6 Locate separated waste materials in areas which minimize material damage.
- .7 Collect, handle, store on-site, and transport off-site, the salvaged reusable and recyclable materials in their separate sorted condition.
 - .1 Transport to an approved and authorized recycling facility.
- .8 Collect, handle, store on-site, and transport off-site, salvaged wasted materials in combined condition.
 - .1 Ship wasted materials to site operating under a Certificate of Approval.
 - .2 Wasted materials must be separated into relevant categories for reuse or recycling.

1.7 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by the Departmental Representative.
- .2 Unless specified otherwise, materials for removal become the Contractor's property.
- .3 Protect, stockpile, store and catalogue the recycled items.
- .4 Separate the non-recyclable materials from the recyclable materials. Transport and deliver non-recyclable materials to a licensed disposal facility.
- .5 Protect the remaining structural components, not removed as part of the demolition work, from any movement or damage.
- .6 Support structures affected by the work. If safety of building is endangered, cease operations and immediately notify the Departmental Representative.
- .7 Protect surface drainage from damage and blockage, as well mechanical and electrical installations from damage as well.

- .8 Separate and store materials produced during dismantling of structures in designated areas.
- .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with the requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled waste materials to off-site processing facility for separation.
 - .3 Provide waybills for the separated materials.

1.8 DISPOSAL OF WASTES

- .1 It is forbidden to bury rubbish or waste materials.
- .2 It is forbidden to dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Keep records of the construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials from the deconstruction as deconstruction/disassembly work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.9 USE OF SITE AND FACILITIES

- .1 Execute work with the least possible interference or disturbance to normal use of the premises.
- .2 Provide temporary security measures approved by the Departmental Representative.

1.10 SCHEDULING

- .1 Co-ordinate the waste management with the other activities at the site to ensure timely and orderly progress of work.

Part 2 - PRODUCTS

2.1 NO OBJECT

- .1 Not used.

Part 3 - EXECUTION

3.1 GENERAL

- .1 Proceed with the work in compliance with the Waste Reduction Workplan (WRW).
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with the appropriate regulations and codes.

3.2 CLEANING

- .1 Remove tools and waste materials on completion of work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate the materials to be reused/recycled into specified sorting areas.

3.3 DIVERSION OF MATERIALS

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

Material Type	Recommended Diversion %	Actual Diversion %
Granular materials surplus	100%	Reuse or stockpile at location indicated by Departmental Representative.
Cut excavation material surplus	100%	Reuse or stockpile at location indicated by Departmental Representative.
Asphalt pavement removal residu	100%	Dispose to a recycling plant off site
Electrical Equipment	100%	Dispose to a recycling plant off site
Metals	100%	Dispose to a recycling plant off site
Other		

3.4 WASTE REDUCTION PLAN (WRW)

- .1 Waste reduction plan (WRW)

(1) Material Category	(2) Person(s) Respon- sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual Quantity	(5) Recycled Amount (unit) Projected	Actual Quantity	(6) Material(s) Destina- tion
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic							

(1) Material Category	(2) Person(s) Respon- sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual Quantity	(5) Recycled Amount (unit) Projected	Actual Quantity	(6) Material(s) Destina- tion
Packag ing							
Card- board Packag ing							
Glass							
Wood							
Metal							
Other							

3.5 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Government Chief Responsibility for the Environment

Province	Address	General Inquiries	Fax
Quebec	Ministère de l'Environnement et de la Faune, Head office 150, boul. René-Lévesque Est, Québec (Quebec) G1R 4Y1	418-643-3127 800-561-1616	418-646-5974
	Conseil de la conservation et de l'environnement 800, place d'Youville, 19e étage Québec (Quebec) G1R 3P4	418-643-3818	

END OF SECTION

Part 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one (1) week prior to contract completion with the Contractor's representative and Departmental Representative to:
 - .1 Verify Project requirements.
 - .2 Review manufacturer's installation instructions and warranty requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure the bonded and licensed company's offices are located in the local service area of the element/work guaranteed, that resource persons are available at all times and are able to follow the requests for information on troubleshooting/warranty repairs.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, (4) four final copies of operating and maintenance manuals in English and French.
- .3 Provide spare parts, maintenance materials and special tools of the same manufacture quality as the products provided in the work.
- .4 Provide evidence, if requested, for the type, source and quality of the products supplied.

1.4 FORMAT

- .1 Organize data in the form of an instructional manual.
- .2 Use binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 mm x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on the spine.

- .4 Cover: identify each binder with printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems and process flow according to the specification Section numbers and in the sequence they appear in the Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.

1.5 CONTENTS – PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission;
 - .2 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Products and systems listing, indexed to content of volume.
- .2 For each product or system, indicate the following:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Datasheet: mark each sheet as to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: purpose of drawings is to supplement product data, to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.6 AS-BUILT DOCUMENTS AND SAMPLES

- .1 Maintain at the site one record copy of the following documents:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product datasheets, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in the field office apart from the documents used for the construction.

- .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of the Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in the copy of the Project Manual, provided by the Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with the construction progress.
 - .1 Do not conceal work until the required information is recorded.
- .4 Contract Drawings and shop drawings: indicate each data to record the actual construction structures, including the following:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimensions and details of structures.
 - .4 Changes made by change orders.
 - .5 Details not indicated on the original Contract Drawings.
 - .6 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction structures, including the following:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: keep the manufacturer's certifications, the inspection certifications, and the field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for the site records.

1.8 FINAL SURVEY

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of the completed work are in conformance, or non-conformance with the Contract Documents.

1.9 MAINTENANCE MATERIALS

- .1 Spare parts.
 - .1 Provide spare parts in the quantities specified in individual specification sections
 - .2 Parts supplied must be from the same manufacturer and be of the same quality as the elements incorporated in the work.
 - .3 Deliver and store spare parts at the specified location.
 - .4 Receive and catalog all the parts.
 - .1 Submit the inventory list to the Departmental Representative.
 - .2 Include the approved listings in the Maintenance Manual.
 - .5 Obtain receipt of all delivered parts and submit before the final payment.
- .2 Special tools.
 - .1 Provide special tools in the amounts specified in the individual specification sections.
 - .2 Tools should be labeled with their function and the equipment which for they are intended.
 - .3 Deliver and store special tools where indicated.
 - .4 Receive and catalog the special tools.
 - .1 Submit an inventory list to the Departmental Representative.
 - .2 Include approved listings in the Maintenance Manual.

1.10 DELIVERY, STORAGE AND HANDLING

- .1 Store spare parts, materials and replacement materials and special tools as to prevent any damage or deterioration.
- .2 Store spare parts, materials and replacement materials and special tools in their original packaging and kept in good condition with the manufacturer's seal and label intact.
- .3 Store items that may be damaged by bad weather in wheatherproof enclosures.
- .4 Store paints and products likely to freeze in a heated and ventilated room.
- .5 Evacuate items or goods damaged or deteriorated, replace them with new ones at no additional cost, and submit these to the Departmental Representative for review.

1.11 WARRANTIES AND BONDS

- .1 Develop a warranty management plan including all the information relevant to Warranties.
- .2 Submit the warranty management plan, thirty (30) days before the planned pre-warranty meeting, to the Departmental Representative for approval.
- .3 Warranty management plan shall include the required actions and documents to assure that the Departmental Representative will benefit from the warranties to which it is entitled.
- .4 Provide the plan in a narrative form and include sufficient details to make it suitable for the use by the future maintenance and repair personnel.
- .5 Submit to the Departmental Representative for approval prior to each monthly pay estimate, the available warranty information obtained during the construction phase.
- .6 Assemble approved information in a binder, submit upon acceptance of the work and organize binder as follows:

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible personnel.
- .3 Obtain two (2) copies of signed warranties and bonds, from the subcontractors, suppliers, and manufacturers, within ten (10) days after the completion of the applicable part of the work.
- .4 Ensure that the documents are in the proper form, contain the full information, and that they are notarized.
- .5 Countersign submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items commissioned with the Owner's approval, do not change the date of beginning of the warranty until the substantial completion date is determined.
- .8 Four (4) months and nine (9) months after the date of reception of work, conduct joint warranty inspections with the Departmental Representative.
- .9 The warranty management plan shall include or indicate the following:
 - .1 Roles and responsibilities of personnel associated with the various warranties, including the points of contact and telephone numbers of responsible personnel within the Contractor's, subcontractors', manufacturers' and suppliers' organizations involved.
 - .2 Provide list for each warranted equipment, components, systems or construction lot under warranty and indicating for each, the following:
 - .1 Name of component, equipment, system or lot.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of the manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of spare parts distributors and materials/equipment replacement suppliers.
 - .6 Warranties and terms of warranty: include one-(1) year overall general construction warranty. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting and expiration dates of the warranty.
 - .9 Summary of maintenance procedures required to maintain the warranty in force.
 - .10 Cross-Reference to the specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair/troubleshooting time expected for the various warranted equipment.
 - .3 The expression of the intention of the Contractor to be present for the inspections required at four (4) months and nine (9) months after the completion of the work concerned.

- .4 The labeling procedure of the components, materials and systems covered by an extended warranty, and its progress.
- .5 Display copies of the operating and maintenance instructions near the designated hardware parts, whose operating characteristics are important for reasons relating to the warrantee or security.
- .10 Respond in a timely manner to oral or written requests of required construction warranty repair/troubleshooting work.
- .11 All oral instructions are to be followed by written instructions.
 - .1 Failure to respond to these obligations will be cause for the Departmental Representative to proceed with action against Contractor.

1.12 WARRANTY TAGS

- .1 At the time of installation, label each component, material or system covered by a warranty. Use sustainable labels, resistant to water and oil and approved by the Departmental Representative.
- .2 Attach labels using a copper wire and spray with a waterproof silicone coating.
- .3 Leave date of reception until the work is accepted for occupancy.
- .4 The labels must contain the information and signatures listed below.
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Contractor's signature.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

- .1 Not used.

END OF SECTION

Part 1 - GENERAL

1.1 ADMINISTRATIVE MODALITIES

- .1 Two (2) weeks before the date of the provisional completion of the works, perform for the benefit of the Client's personnel, planned demonstrations of the functioning and maintenance operations of the devices, equipment and systems installed.
- .2 The Client will provide a list of personnel members who must take this training and will, at the agreed times, attend meetings organized for that purpose.
- .3 Preparatory works
 - .1 Ensure the conditions of performance of demonstrations of the functioning of the equipment, materials and systems as well as training sessions meet the requirements.
 - .2 Ensure that the designated personnel is present.
 - .3 Ensure that equipment, materials and systems were inspected and turned on.
 - .4 Ensure testing, adjusting and balancing have been executed, and the devices, equipment and systems are fully operational.
- .4 Démonstration and training
 - .1 Show how to initiate the startup, operation, control, adjustment, fault diagnosis, servicing and maintenance of each device, system and equipment, as scheduled, to where are those elements.
 - .2 Teach staff all stages of the operation and maintenance of devices, equipment and systems using the operating and maintenance manuals provided.
 - .3 Perform a detailed review of the content of textbooks in order to explain all aspects of operation and maintenance.
 - .4 Gather, if any, additional data required for training and insert them in the operating and maintenance manuals.

1.2 DOCUMENT/SAMPLE FOR SUBMITTALS/INFORMATION

- .1 Submit documents and samples required in accordance with Section 01 33 00 Documents and samples to be submitted.
- .2 Two (2) weeks before the specified dates, submit to the Departmental Representative, for approval, a calendar showing the date and time agreed for the demonstration of the operation of each device, equipment and system.
- .3 In the week following these demonstrations, submit documents confirming that they have been carried out and that the appropriate training has been satisfactorily provided.
- .4 Specify the date and time of each demonstration carried out and the list of those present.
- .5 Provide complete copies of the operating and maintenance manuals that will be used to demonstrate the function and maintenance operations of devices, equipment and systems and related training sessions.

1.3 QUALITY ASSURANCE

- .1 Where it is required in some sections a manufacturer's authorized representative must demonstrate the functioning of the devices, equipment and systems installed,
 - .1 Ensure the training of Contracting Agency personnel;
 - .2 Provide a written document confirming that such a demonstration was performed and the related training was provided.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

- .1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS.

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 45 00 - Quality Control.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 01 35 29.06 - Health and Safety Requirements.
- .6 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 MEASUREMENT PROCEDURES.

- .1 Measure removal of fences and gates in linear meter..
- .2 Payment for salvage, stockpiling, sealing, disposal, alternative disposal, recycling, excavating and restoration will be included in above removal items.

1.3 REFERENCES

- .1 Ministère de la Justice Canada (Jus).
 - .1 Loi canadienne sur l'évaluation environnementale (LCEE), 1997, ch. 37.
 - .2 Loi canadienne sur la protection de l'environnement (LCPE), 1999, ch. 33.
- .2 Santé Canada - Système d'information sur les matières dangereuses utilisées au travail (SIMDUT).
 - .1 Fiches signalétiques (FS).
- .3 Transports Canada (TC).
 - .1 Loi de 1992 sur le transport des marchandises dangereuses (LTMD), ch. 34.

1.4 DEFINITIONS

- .1 Demolition: rapid destruction of building following removal of hazardous materials.
- .2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
- .3 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

1.5 ADMINISTRATIVE PRESCRIPTIONS

- .1 On-site meeting

- .1 One (1) week before the start of the demolition work covered by this section, call a meeting in accordance with Section 01 32 16.07- Construction progress schedule - Bar (GANTT) chart , during which must be examined the following elements
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
 - .2 Prior to beginning works, make arrangements with the Departmental Representative to review existing condition next to planned demolition works.
 - .3 Hold monthly meetings.
 - .4 Ensure the presence of all key personnel.
 - .5 Reporting Requirements : CGD must produce reports and other required documents.
 - .6 At each meeting, the DMC must report in writing of the status of the situation regarding recovery of waste.
 - .7 In case of any change in dates and / or meeting times established at the time of contract award, the Departmental Representative will notify the parties in writing 24 hours before the time announced for the meeting.
- .2 Health and safety
 - .1 Observe construction professional health and safety rules according to section 01 35 29.06 – Health and safety requirements.

1.6 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings.
 - .1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.
 - .2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Canada.
- .3 Hazardous Materials
 - .1 Provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .4 Waste Reduction Workplan: prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate:
 - .1 Descriptions of and anticipated quantities of materials to be salvaged reused, recycled and landfilled.
 - .2 Schedule of selective demolition.
 - .3 Number and location of dumpsters.
 - .4 Anticipated frequency of tippage.
 - .5 Name and address of haulers, waste facilities, waste receiving organizations.

.5 Certificates: submit copies of certified weigh bills, bills of lading, receipts from authorized disposal sites and reuse and recycling facilities for material removed from site upon request of Departmental Representative.

.1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, receiving organizations listed in Waste Reduction Workplan.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, TDGA, and applicable Provincial/Territorial regulations.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Perform Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Storage and Protection.

.1 Protect in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Departmental Representative and at no cost to Departmental Representative.

.3 Remove and store materials to be salvaged, in manner to prevent damage.

.4 Store and protect in accordance with requirements for maximum preservation of material.

.5 Handle salvaged materials as new materials.

.3 Waste Management and Disposal.

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

.2 Divert excess materials from landfill to site approved by Departmental Representative.

.3 Separate for reuse and recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with CEPA and Regional and Municipal regulations.

.6 Label location of salvaged material's storage areas and provide barriers and security devices.

.7 Ensure emptied containers are sealed and stored safely.

.8 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt, and gypsum.

.9 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

1.9 SITE CONDITIONS

.1 Site Environmental Requirements.

.1 Perform work in accordance with Section 01 35 43 - Environmental Procedures.

- .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
 - .1 Ensure proper disposal procedures are maintained throughout the project.
- .4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities as directed by Departmental Representative.
- .6 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .2 Existing Conditions.
 - .1 Remove contaminated or hazardous materials as directed by Departmental Representative from site, prior to start of demolition Work, and dispose of at designated disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

1.10 SCHEDULING

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
 - .1 Notify Departmental Representative in writing when unforeseen delays occur.

Part 2 PRODUCTS

2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 EXECUTION

3.1 PREPARATION

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OF HAZARDOUS WASTES

- .1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 REMOVAL OPERATIONS

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.
- .3 Excavate at least 300 mm below pipe invert, when removing pipes under existing or future pavement area.
- .4 Salvage.
 - .1 Items to be salvaged: minimum rate objective of diversion: 100%.
 - .2 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as indicated.
- .5 Disposal of Material.
 - .1 Dispose of materials not designated for salvage or reuse on site as instructed by Departmental Representative at authorized facilities approved in Waste Reduction Workplan.
 - .2 Trim disposal areas to approval of Departmental Representative.
- .6 Backfill.
 - .1 Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.4 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.
- .4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.5 REMOVAL FROM SITE

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project.
- .2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .3 Transport material designated for alternate disposal using approved haulers, facilities, receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.
 - .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, receiving organizations listed in Waste Reduction Workplan.
- .4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
 - .1 Disposal Facilities: approved and listed in Waste Reduction Workplan.

- .2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

3.6 RESTORATION

- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work.
- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.7 CLEANING

- .1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.
 - .1 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

Part 1 – GENERAL

1.1 RELATED SECTIONS

- .1 Section 32 11 23 – Aggregate Base Course.

1.2 MEASUREMENT PROCEDURES

- .1 No measurement of saw cuts will be made. The price related to these activities is included in the various articles on the bill for which saw cuts are required.
- .2 Payment under this item will include operations involved in removing, hauling and stockpiling designated pavement and cleaning of remaining pavement surface.
- .3 Milling of the longitudinal joint with a width of 300 mm between the paved strips is measured by the meter. If the contractor has to mill a width exceeding 300 mm, the removal of the additional pavement and the replacement of it are at the Contractor's expense.
- .4 Measuring pavement milling in square meters. Do not measure the pavement milling executed for crack repair. Milling is separated in 3 items in the price schedule for the following thicknesses:
 - .1 Milling of the mix with a constant thickness of ± 40 mm .
 - .2 Transition milling of the mix variable thickness from 0 to 40 mm .
 - .3 Transition milling of the mix varying thickness from 0 to 60 mm .
- .5 Milling necessary due to detachment of the underlying paving layer is measured in square meters of remilled surfaces.
- .6 Measuring the adjustment of observation wells in units of observation wells actually adjusted.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Asphalt pavement removed and milled becomes the property of the Contractor and it should be disposed off site at a licensed site.
- .2 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 – PRODUCTS

2.1 EQUIPMENT

- .1 Use cold milling, planning or grinding equipment with automatic grade controls capable of operating from stringline, and capable of removing part of pavement surface to depths or grades indicated.

Part 3 – EXECUTION

3.1 PREPARATION

- .1 Prior to beginning removal operation, inspect and verify with Departmental Representative areas, depths and lines of asphalt pavement to be removed. Results of the boring logs executed in the existing pavement of runway and movement areas are presented in Appendix A.

3.2 PROTECTION

- .1 Protect existing pavement not designated for removal, light units and structures from damage. In event of damage, immediately replace or make repairs to approval of Departmental Representative at no additional cost.

3.3 REMOVAL

- .1 Remove existing asphalt pavement to lines and grades as indicated.
- .2 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.
- .3 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .4 Provide for suppression of dust generated by removal process.
- .5 Dispose of removed pavement off site at an authorized site.
- .6 In the event of milled surfaces are delaminated, the Contractor shall notify the Departmental Representative prior to paving. If necessary, the Contractor shall make a further milling of the areas indicated by the Departmental Representative.
- .7 Before laying an asphalt strip adjacent to a cold asphalt strip, the Contractor shall proceed to milling a strip of 300 mm along the longitudinal joint to remove the rounded surface that does not meet the profile specified in the plan. The Contractor shall ensure that the longitudinal joint is straight and that the strip that is kept has a constant width. The Contractor shall use a guiding system to meet these requirements.
- .8 The Contractor shall ensure to minimize the width of the rounded paving. This includes adjusting its method of compaction to minimize this width in accordance with Section 32 12 16 – Asphalt paving.

3.4 ADJUSTMENT

- .1 Adjust existing observation wells indicated on the plans at the proposed paving.

3.5 FINISH TOLERANCE

- .1 Finished surfaces in areas where asphalt pavement has been removed to be within 5 mm of grade specified but not uniformly high or low.

3.6 SWEEPING

- .1 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.

END OF SECTION

Part 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 05 16 – Aggregate Materials.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C127-12, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.
 - .2 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .3 ASTM D1557-12, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - .4 ASTM D4253-00, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.3 DEFINITIONS

- .1 Corrected maximum dry density is defined as:
 - .1 $D = (F1 \times D1) + (0.9 \times D2 \times F2)$
 - .2 In which:
 - .1 $D =$ corrected maximum dry density kg/m³.
 - .2 $F1 =$ fraction (decimal) of total field sample passing 4.75 mm sieve
 - .3 $F2 =$ fraction (decimal) of total field sample retained on 4.75 mm sieve (equal to $1.00 - F1$)
 - .4 $D1 =$ maximum dry density, kg/m³ of material passing 4.75 mm sieve determined in accordance with Method A of ASTM D1557.
 - .5 $D2 =$ bulk density, kg/m³, of material retained on 4.75 mm sieve, equal to $1000G$ where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.
- .2 For free draining aggregates, determine $D1$ (maximum dry density) to ASTM D4253 dry or wet method as directed by Departmental Representative.

Part 2 – PRODUCTS

- .1 Not used.

Part 3 – EXECUTION

- .1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 32 11 23 – Aggregate Base Courses.
- .2 Section 32 12 16 – Asphalt paving.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2 Cahier des Charges et Devis Généraux des infrastructures routières (CCDG) – Construction et réparation. Édition 2016.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Allow continual sampling by Departmental Representative during production.
- .3 Provide Departmental Representative with access to source and processed material for sampling.
- .4 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.
- .5 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.
- .6 Provide water, electric power and propane to Departmental Representative laboratory trailer at production site.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular materials from landfill to local quarry as approved by Departmental Representative.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
 - .1 Greatest dimension to exceed five times least dimension.

- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
 - .1 Natural sand.
 - .2 Manufactured sand.
 - .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
 - .3 Light weight aggregate, including slag and expanded shale.

2.2 SOURCE QUALITY CONTROL

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.
- .2 If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
- .3 Advise Departmental Representative 4 weeks in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 EXECUTION

3.1 PRÉPARATION

- .1 Aggregate source preparation
 - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials.
 - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
 - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
 - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.

- .2 Processing
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Departmental Representative.
 - .3 Wash aggregates, if required to meet specifications. Use only equipment approved by Departmental Representative.
 - .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
- .3 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .4 Stockpiling
 - .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet Project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 h of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:
 - .1 Max 1.5 m for coarse aggregate and base course materials.
 - .2 Max 1.5 m for other materials.
 - .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
 - .9 Do not cone piles or spill material over edges of piles.
 - .10 Do not use conveying stackers.
 - .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.
- .3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

END OF SECTION

Part 1 GENERAL

1.1 MEASUREMENT PROCEDURES

- .1 Clearing at ground level where indicated is measured in hectares (ha) actually cleared.
- .2 Cutting isolated trees (trunk diameter greater than 100 mm) at ground level is measured by the number of isolated trees actually cut.
- .3 Grubbing isolated trees (trunk diameter greater than 100 mm) is measured by the actual number of trees removed.

1.2 REFERENCES

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

1.3 DEFINITIONS

- .1 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.
- .2 Cutting isolated trees is to cut the trees designated at ground level and disposing of fallen timber and debris.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .3 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 STORAGE AND PROTECTION

- .1 Prevent damage to natural features, bench marks, existing pavement and site appurtenances 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.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 PRODUCTS

2.1 MATERIALS

- .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.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PREPARATION

- .1 Inspect site and verify with Departmental Representative, items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
 - .1 Notify Departmental Representative immediately of damage to or when unknown existing utility lines are encountered.
 - .2 When utility lines which are to be removed are encountered within area of operations, notify Departmental Representative in ample time to minimize interruption of service.
- .3 Notify utility authorities before starting clearing.
- .4 Keep roads and walks free of dirt and debris.

3.3 APPLICATION

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

3.4 CLOSE CUT CLEARING

- .1 Close cut clearing to ground level.
- .2 Cut down trees overhanging area cleared as directed by Departmental Representative.
- .3 Cut off unsound branches on trees designated to remain as directed by Departmental Representative.

3.5 ISOLATED TREE CUTTING

- .1 Cut isolated trees with a diameter greater than 100 mm as indicated by Departmental Representative at ground level using a saw.

3.6 TREE GRUBBING

- .1 Completely removal of isolated trees (with a diameter greater than 100 mm) stump as indicated by the Departmental Representative at ground level using an excavator or other means approved by the Departmental Representative.

3.7 REMOVAL AND DISPOSAL

- .1 Remove cleared materials to disposal area as designated by local regulations in use.
- .2 Burn of clearing materials is prohibited.

3.8 FINISHED SURFACE

- .1 Leave ground surface in condition suitable for immediate grading operations to approval of Departmental Representative.

3.9 CLEANING

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

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 02 41 13 - Selective Site Demolition.
- .3 Section 31 11 00 - Clearing and Grubbing.
- .4 Section 31 23 16.26 – Rock removal.
- .5 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .6 Section 31 05 10 - Corrected Maximum Dry Density for Fill.

1.2 MEASUREMENT PROCEDURES

- .1 Rock Excavation:
 - .1 Measure in cubic metres.
 - .2 Calculate volume excavated from solid rock surfaces from cross sections of original rock surface and design grade line for excavation. Where design grade line is less than [300] mm below original rock surface, consider excavation depth to be 300 mm below original rock surface.
 - .3 Determine volume of excavated boulders and rock fragments by measuring three maximum mutually perpendicular dimensions.
- .2 Common Excavation:
 - .1 Measure in cubic metres calculated from cross sections taken in areas of excavation.
 - .2 In areas of excavation on airport property (cut areas and borrow pits), take initial cross sections after clearing, and grubbing and prior to stripping of topsoil.
 - .3 Topsoil stripping is considered as common excavation.

1.3 DEFENITIONS

- .1 Definitions:
 - .1 Excavation classes: 2 classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock Excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of [1] m³.
 - .2 Common Excavation: excavation of materials of whatever nature, which are not included under definition of rock excavation, including dense tills, hardpan and frozen materials.
 - .2 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .3 Waste material: excavated material unsuitable for use in work or surplus to requirements.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C117-13, Test Method for Materials Finer Than 75- Φ m (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63 (2007)E2, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D4318-10E1, Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Not used

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

3.2 STRIPPING OF TOPSOIL

- .1 Commence topsoil stripping of areas as directed by Departmental Representative after area has been cleared of brush, weeds and these materials removed from site.
- .2 Strip topsoil to depths as directed by Departmental Representative.
 - .1 Do not mix topsoil with subsoil.
- .3 Stockpile in locations as directed by Departmental Representative.
 - .1 Stockpile height: [2] m maximum.
 - .2 Reuse topsoil on site as directed by Departmental Representative.

3.3 EXCAVATING

- .1 General:
 - .1 Advise Departmental Representative 7 days minimum in advance of excavation operations for initial cross sections to be taken.
 - .2 Excavate to lines, grades, elevations and dimensions as directed by Departmental Representative.
 - .3 Ensure drainage of excavated areas and maintain crowns and cross slopes to provide surface drainage.
 - .4 Notify Departmental Representative whenever unsuitable materials are encountered in cut sections, remove unsuitable materials as directed and replace with material approved by Departmental Representative to depth and extent as directed.
 - .5 Treat ground slopes at grade points, where subgrade is on transition from excavation to embankment or earth to rock, in accordance with Transport Canada's guidelines for "Cut and Fill Construction Methods at Grade Points" as directed by Departmental Representative.
 - .6 Dispose of waste material off project limits as directed by Departmental Representative.
- .2 Rock excavation:
 - .1 During excavation: when material appearing to conform to classification for rock is encountered, notify Departmental Representative in sufficient time to enable measurements to be made to determine volume of rock.
 - .2 Provide drainage to ditches, leaving no undrained pockets in foundation.

3.4 PLACING FILL

- .1 Before taking material from borrow areas, completely use, in fill areas, suitable materials removed from excavation.
- .2 Maintain crowned surface during construction to ensure run-off of surface water.
- .3 Material containing less than 25% by volume of rock fragments larger than 100 mm maximum dimension:
 - .1 Place and compact to full width in uniform layers 20 mm maximum loose thickness.
 - .2 Compact fill materials, in non-pavement areas, minimum 95 % of corrected maximum dry density.
- .4 Do not place stones and boulders exceeding 50 mm maximum dimension within 100 mm of finished surface in graded areas.

3.5 SUBGRADE COMPACTION IN PAVEMENT AREAS

- .1 Fill area: do not place stones and boulders exceeding 150 mm maximum dimension within 0.5 m of subgrade elevation.
- .2 Remove stones and boulders, in cut areas, exceeding 150 mm maximum dimension within specified depth, for subgrade compaction.
- .3 Scarify and mix pavement subgrade surface, after grading has been completed, to required depth of subgrade compaction.

- .4 Compact top 150 mm of cohesive subgrade soils 98 % minimum of corrected maximum dry density.
- .5 Compact top 300 mm of cohesion less subgrade soils 98 % minimum of corrected maximum dry density.
- .6 Break soil down to sizes suitable for compaction and mix for uniform moisture and soil conditions to full depth of layer.pour que
- .7 Bring moisture content of soil to level required to achieve specified compaction. Add water or aerate as required.
- .8 Shape subgrade to required cross section and grade.
- .9 Remove upper portion to depth necessary, when subgrade preparation and compaction can not be achieved to requirement in single layer, to achieve requirement. Remove, replace and compact such materials at no extra cost to Departmental Representative.

3.6 FINISHING AND TOLERANCES

- .1 Blade finished surfaces in cut and fill areas free from ruts, depressions, rocks in excess of 150 mm and debris.
- .2 Roll finished surfaces to tight dense condition.
- .3 Finish pavement subgrade within 25 mm of design elevations, but not uniformly high or low.
- .4 Finish graded area within 30 mm of design elevations, but not uniformly high or low.
 - .1 Surfaces free from depressions exceeding 30 mm in 5 m.

3.7 MAINTENANCE

- .1 Maintain finished surfaces in a condition in accordance with this Section until succeeding material is applied or until acceptance by Departmental Representative.

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 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 in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 – GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 22 14 – Airfield grading.
- .2 Section 31 23 33.01 – Excavation, trenching and backfilling.

1.2 REFERENCES

- .1 Definitions
 - .1 Rock: any solid material in excess of 1 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 PPV: peak particle velocity.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

1.4 PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Not used.

Part 3 - EXECUTION

3.1 ROCK REMOVAL

- .1 Co-ordinate this Section with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Remove rock to alignments, profiles, and cross sections as indicated.
- .3 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.
- .4 Excavate rock to horizontal surfaces with slope not to exceed 1:4.
- .5 Cut trenches to widths as indicated.
- .6 Remove boulders and fragments which may slide or roll into excavated areas.
- .7 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.2 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Rock disposal:
 - .1 Dispose of removed rock off site as approved by Departmental Representative.

3.3 PROTECTION

- .1 Prevent damage to surroundings and injury to persons. Erect fencing, post guards, sound warnings and display signs when blasting to take place.

END OF SECTION

Part 1 GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63(2007)E2, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-12E2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft;) (600 kN-m/m;).
 - .5 ASTM D1557-12E1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft;) (2,700 kN-m/m;).
 - .6 ASTM D4318-10^E1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .2 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/ Test methods and Standard Practices for Concrete.

1.2 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock : solid material in excess of 1.00 m³ ; and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.2.

Sieve designation	% Passing
2,00 mm	100
0,10 mm	45 - 100
0,02 mm	10 - 80
0,005 mm	0 - 45

- .2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .4 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.
 - .3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to Departmental Representative written notice when bottom of excavation is reached.
 - .5 Submit to Departmental Representative testing results and report as described in PART 3 of this Section.
- .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 and location plan of relocated and abandoned services, as required.
- .4 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

1.4 QUALITY ASSURANCE

- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
- .2 Where Departmental Representative is employee of Contractor, submit proof that Work by Departmental Representative is included in Contractor's insurance coverage.
- .3 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Québec, Canada.
- .5 Keep design and supporting data on site.
- .6 Engage services of qualified professional Engineer who is registered or licensed in Province of Québec, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .7 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.
- .8 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.
- .2 Divert excess aggregate materials from landfill to local quarry for reuse as directed by Departmental Representative.

1.6 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning excavation Work, notify applicable Departmental Representative and establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations.
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

- .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing. Costs for such Work to be paid by Departmental Representative.
- .9 Record location of maintained, re-routed and abandoned underground lines.
- .10 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and 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 MATÉRIALS

- .1 Fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.
 - .3 Table:

Sieve designation	% Passing
	Fill
75 mm	100
50 mm	---
37,5 mm	---
25 mm	---
19 mm	---
12,5 mm	---
9,5 mm	---
4,75 mm	---
2,00 mm	---
0,425 mm	0 - 30
0,180 mm	---
0,075 mm	0 - 8

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.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

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

3.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.4 STOCKPILING

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

3.5 DEWATERING AND HEAVE PROTECTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures in approved manner not detrimental to public and private property, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATION

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

- .12 Notify Departmental Representative when bottom of excavation is reached.
- .13 Obtain Departmental Representative approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .15 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.7 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

3.8 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Departmental Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1 m.

- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative:
 - .2 If approved by Departmental Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.
- .6 Place unshrinkable fill in areas as indicated.
- .7 Consolidate and level unshrinkable fill with internal vibrators.
- .8 Install drainage system in backfill as directed by Departmental Representative.

3.9 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 11 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as directed by Departmental Representative and according to section 32 91 19.13 – Topsoil placement and grading.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

- .1 No measurement for payment will be made pavement cleaning.
- .2 Measure removal of pavement markings in square metres of pavement markings removed.

1.2 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 each type of abrasives and solvent used on project.
 - .2 Submit for approval to Departmental Representative Material Safety Data Sheet (MSDS) from WHMIS to section 01 33 00. Contractor shall keep on site a copy of all MSDSs.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Develop Construction Waste Management Plan related to Work of this Section.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Abrasives and solvents used for removal of paint, oil, grease, rubber deposits: proprietary products specially designed for pavement cleaning, subject to approval by Departmental Representative.

Part 3 EXECUTION

3.1 REMOVING PAVEMENT MARKINGS

- .1 Remove rubber tire deposits and paint markings, in areas as directed by Departmental Representative, by sand blasting, rotary grinding, heater planning or other method approved in writing by Departmental Representative.
- .2 Exercise care to avoid dislodging of coarse aggregate particles, excessive removal of fines, damage to bituminous binder or damage to joint and crack sealers.
- .3 Do not heat pavement surfaces above 120 degrees C, when using heater planning equipment.

3.2 PAVEMENT SURFACE CLEANING

- .1 Remove sealing compound which has protruded excessively, where directed by Departmental Representative.
 - .1 Dispose of removed material as directed by Departmental Representative.
- .2 Remove dust, contaminants, loose and foreign materials, oil and grease, in areas as directed by and by method approved in writing by Departmental Representative].
- .3 Use rotary power brooms or vacuum sweepers supplemented by hand brooming.

3.3 CLEANING

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

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 32 12 16 – Asphalt paving
- .2 Section 32 12 13.16 - Asphalt tack coats
- .3 Section 32 17 23 – Pavement markings

1.2 MEASUREMENT PROCEDURES

- .1 Measure major pavement crack filling in square metres (m²) for each type of crack repair. Payment includes sawing and removal and/or milling of existing pavement both side of the crack, supply and install new asphalt paving ESG-10 and tack coat. Crack repair as following:
 - .1 Crack repair type A: Removal and/or milling of 1 m width by 50 mm thickness
 - .2 Crack repair type B: Removal and/or milling of 0.3 m width by 40 mm thickness

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-14, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D2419-14, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
 - .3 CAN/CGSB-16.1-M89, Cutback Asphalts for Road Purposes.
 - .4 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
 - .5 CAN/CGSB-16.4-M89, Emulsified Asphalts, Cationic Type, for Road Purposes.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide access for Departmental Representative to sample materials actually incorporated into Work as required.

1.5 CERTIFICATES

- .1 Submit manufacturer's test data and certification that crack repair materials meet requirements of this Section to Departmental Representative at least two (2) weeks prior to beginning Work.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.
- .2 Do not dispose of unused sealing mix into the sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Asphalt concrete ESG-10 to section 32 12 16 – Asphalt paving
- .2 Tack coat to section 32 12 13.16 – Asphalt Tack Coat

Part 3 EXECUTION

3.1 CRACK REPAIR

- .1 Two (2) different type of repair are possible:
 - .1 Type A (1.0 m width x 50 mm thickness)
 - .2 Type B (0.3 m width x 40 mm thickness).
- .2 Repair cracks as directed by Departmental Representative. Departmental Representative shall define which repair's type will be used.
- .3 Crack repairs
 - .1 Mill asphalt pavement along the crack to define thickness
 - .2 Remove loose material and dispose outside the site
 - .3 Clean all debris with a vacuum mechanical broom sweeper truck
 - .4 Work shall be approved by Departmental representative prior the application of tack coat.
 - .5 Apply at readily determined and controlled rates of 0.30 L/m² with uniform pressure on vertical face and milled surface
 - .6 Fill with asphalt paving up to existing pavement manually or mechanically.
 - .7 Compact asphalt paving to 95% with appropriate equipment.
 - .8 Provide new pavement marking where it was erased or removed by crack repairs in the area of runway 16-34 where there is no new pavement layer expected

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 05 10 – Corrected maximum dry density for fill
- .2 Section 31 05 16 – Aggregate materials.
- .3 Section 32 12 16 – Asphalt paving

1.2 MEASUREMENT PROCEDURES

- .1 Measure granular base, runway and taxiways edges reloading and graded surface on runway strips reloading in tonnes of material incorporated into Work and accepted in writing by Departmental Representative. Measure in three (3) separated items.
- .2 Payment includes preparation of the base course, crushing, transport, placing and compaction of aggregates.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-13, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131/C131M-14-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136/C136M-14-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-12E2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-12E1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D1883-14, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-10E1, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Bureau de normalisation du Québec (BNQ).
 - .1 Standards NQ 2560-114-II/2002, Civil Engineering Work - Aggregates – Part II: Sub-base course, capping layer, surface course and shoulder (aggregates used for roadways)
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .4 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832-R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Transport, store and handle materials and equipment to section 01 61 00 – Common Product Requirement
- .2 Deliver and stockpile aggregates in accordance with Section 31 05 16 - Aggregate Materials. Stockpile minimum 50% of total aggregate required prior to beginning operation.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to NQ 2560-114-II/2002

Sieve Designation	% Passing Granular base MG-20	% Passing Reloading MG-20b
112 mm	-	-
80 mm	-	-
56 mm	-	-
40 mm	-	-
31 mm	100	100
20 mm	90-100	90-100
14 mm	68-93	68-93
5 mm	35-60	35-60
1.25 mm	19-38	19-38
0.315 mm	9-17	9-17
0.080 mm	2-7	5-11

- .1 Liquid limit: to ASTM D4318, maximum 25
- .2 Plasticity index: to ASTM D4318, maximum 6
- .3 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 45
- .4 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face.

Part 3 EXECUTION

3.1 SEQUENCE OF OPERATION

- .1 Place granular base after sub-base surface is inspected and approved by Departmental Representative.
- .2 Placing
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading base material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
 - .7 Place material to full width in uniform layers not exceeding 300 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .9 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Place granular aggregate MG-20b for runway and taxiways edges reloading and graded surface on runway strips reloading after asphalt paving placed.
- .4 Placing
 - .1 Construct granular reloading up to same level than adjacent pavement.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading MG-20b material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
 - .7 Place material to full width in uniform layers not exceeding 300 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .9 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .5 Compaction Equipment
 - .1 Compaction equipment to be capable of obtaining required material densities.
- .6 Compacting

- .1 Compact to density not less than 100% corrected maximum dry density in accordance with section 31 05 10 – Corrected maximum dry density for fill.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.
- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.3 CLEANING

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

3.4 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 32 12 16 – Asphalt paving
- .2 Section 32 01 11.02 – Pavement crack cleaning and filling

1.2 MEASUREMENT PROCEDURES

- .1 No measurement required for asphalt tack coat. Asphalt tack coat will be included in the payment of asphalt pavement or crack repairs, and includes furniture, transport, placing and all related works.

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D140-09, Standard Practice for Sampling Bituminous Materials.
- .2 Ministère des Transports, de la Mobilité Durable et de l'Électrification des transports du Québec (MTMDET).
 - .1 Tome VII Matériaux.

1.4 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Sample asphalt tack coat material to: ASTM D140.
- .3 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140.
- .4 Provide certificate of conformity prior the beginning of Work

1.5 QUALITY ASSURANCE

- .1 Upon request by Departmental Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this section.

1.6 DELIVERY, STORAGE AND DISPOSAL

- .1 Deliver, store and handle materials in accordance with ASTM D140.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Emulsified Asphalt: to MTMDET standard 4105. Emulsified asphalt (cationic or anionic) shall be compatible with aggregate provided in the asphalt mix.

- .1 Cationic emulsified asphalt (ex CRS-1h) to ASTM D D977 and for anionic emulsified asphalt (ex RS) to ASTM D2397/D2397M.
- .2 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

- .1 Pressure distributor to be:
 - .1 Designed, equipped, maintained and operated so that asphalt material can be:
 - .1 Maintained at even temperature.
 - .2 Applied uniformly on variable widths of surface up to 5 m.
 - .3 Applied at readily determined and controlled rates from 0.2 to 0.4 L/m² with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.05 L/m².
 - .4 Distributed in uniform spray without atomization at temperature required.
 - .2 Equipped with meter, registering metres of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.
 - .3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.
 - .4 Equipped with an easily read, accurate and sensitive device which registers temperature of liquid in reservoir.
 - .5 Equipped with accurate volume measuring device or calibrated tank.
 - .6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.
 - .7 Cleaned if previously used with incompatible asphalt material.

Part 3 EXECUTION

3.1 APPLICATION

- .1 Obtain Departmental Representative approval of surface before applying asphalt tack coat.
- .2 Apply asphalt tack coat only on clean and dry surface.
- .3 Dilute asphalt emulsion with water at 1:1 ratio for application.
 - .1 Mix thoroughly by pumping or other method approved by Departmental Representative.
- .4 Apply asphalt tack coat evenly to pavement surface at rate of 0.20 L/m² on newly paved asphalt, 0.25 L/m² on used asphalt and 0.30 L/m² on milled surfaces.
- .5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .6 Do not apply asphalt tack coat when air temperature is less than 10 degrees C or when rain is forecast within 2 hours of application.
- .7 Apply asphalt tack coat only on unfrozen surface.

- .8 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.
- .9 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .10 Keep traffic off tacked areas until asphalt tack coat has set.
- .11 Re-tack contaminated or disturbed areas as directed by Departmental Representative.
- .12 Permit asphalt tack coat to set before placing asphalt pavement.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 05 16 – Aggregate materials.
- .2 Section 32 11 23 – Aggregate Base course.
- .3 Section 32 12 13.16 – Asphalt Tack Coats.

1.2 MEASUREMENT AND PAYMENT

- .1 Measure asphalt concrete paving in tonnes of asphalt concrete for each asphalt concrete mix actually incorporated into Work, including asphalt tack coat.
- .2 Measure the 300 mm asphalt strip to be milled before paving the new strip in linear meter to Section 02 41 13.14 – Asphalt paving removal.
- .3 Any extra asphalt paving required by over milled the 300 mm strip along longitudinal cold seal at his own expenses.
- .4 Additional milling and paving required by detachment of following pavement layer shall be included in surface paving layer.
- .5 Measure asphalt paving for crack repair in square meters, this work is included in crack repair price to section 32 01 11.02 – Pavement crack cleaning and filling.

1.3 PRODUCT DATA AND SUBMITTAL

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C at least 4 weeks prior to beginning Work.
- .3 Submit manufacturer's test data and certification that asphalt cement meets requirements of this Section.
- .4 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for approval at least 4 weeks prior to beginning Work.
- .5 Submit the list and full technical sheets of all equipment to be used on the site to Departmental Representative for approval at least 4 weeks prior to beginning Work and mobilization of Contractor equipment.
- .6 Submit pavement laying plan by phase, anticipated hourly production, anticipated location of longitudinal and transversal joints to Departmental Representative for approval prior to beginning Work.
- .7 Submit by Asphalt plant owner to Departmental Representative for approval prior to beginning Work:
 - .1 Asphalt plant model and year of manufacture.
 - .2 Historical data of the last three years concerning the following elements:
 - .1 Plant maintenance (preventive, improvement, etc.).
 - .2 Asphalt concrete mix produced and annual quantities.
 - .3 Quality report on each asphalt concrete mix produced.

- .3 Hourly and weekly plant production.
- .4 Operational plant restriction (schedule, day, other clients.).
- .5 Independent inspection report which confirms for the current year: performance adjustment for various equipment along the asphalt production line, replacement of parts considered necessary, preventive maintenance to section 01 45 00 – Quality Control.
- .6 Capacity of asphalt cement storage tank.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 During aggregate production, the Contractor has to submit on a daily basis every test results showing crushing regularity, meaning granulometry and every other test results showing the aggregates' conformity.
- .3 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to beginning Work.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and stockpile aggregates in accordance with Section 31 05 16 - Aggregate Materials. Stockpile 100 % of total amount of aggregate required before beginning asphalt mixing operation.
- .2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .3 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.
- .5 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received. Departmental Representative reserves right to check weights as material is received.
- .6 Transport of asphalt concrete shall be with trucks with insulated box shell to keep the asphalt hot until placing asphalt.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Asphalt cement: in accordance to MTQ 4101, grade PG 64-28.
- .2 Contractor shall demonstrate that aggregate have a minimum of 95% of their surface coated with asphalt cement. Contractor shall present result related to affinity aggregate-asphalt cement, for each aggregate sources used in mix to LC 25-009. Departmental Representative could proceed with his own test any time.
- .3 Asphalt cement shall be tested for effect of water to following standards:

- .1 ASTM D1075-11 – Effect of Water on Compressive Strength of Compacted Bituminus Mixtures.
 - .1 Results analyzed by the Lab determine if asphalt cement is accepted.
- .4 Aggregates: in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel to MTQ Standard 4202.
 - .2 Gradations: within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to ministère des Transports, de la Mobilité durable et de l'Électrification des transports, standard 4202.
 - .3 Coarse aggregate: aggregate retained on 5 mm sieve and fine aggregate is aggregate passing 5 mm sieve when tested to ASTM C136.
 - .4 When dryer drum plant or plant without hot screening is used, process fine aggregate through 5 mm sieve and stockpile separately from coarse aggregate.
- .5 Water: to approval of Departmental Representative.
- .6 Asphalt tack to section 32 12 13.16 – Asphalt Tack Coat
- .7 Asphalt mix additionnal characteristics:

<u>Sieve designation</u>	<u>ESG-10</u>
28 mm	-
20 mm	-
14 mm	100
10 mm	92-100
5 mm	52-65
2.5 mm	-
80 µm	4-10

Test	Standard	Requirement
		ESG-10
Polishing stone value	LC21-102	minimum 0,45 (surface layer only)
Sand equivalent	ASTM 2419-09	50 min
Los Angeles	LC 21-400	50,0 % max
Absorption (coarse aggregate)	BNQ 2560-067	2,0 % max
Loss by washing (coarse aggregate)	NQ 2560-114-I/2002	1,5 % max
Light particles	NQ 2560-260	3,0 % max
Flat particles	NQ 2560-265	25,0 % max
Elongated particles	NQ 2560-265	40,0 % max
Crushed particles		100,0 %
Micro-Deval (coarse aggregate)	NQ 2560-070	20,0% max
Micro-Deval (fine aggregate)	NQ 2560-070	30,0 % max
Micro-Deval + Los-Angeles		80 max

- .8 The use of an high strip-resistant asphalt cement could be necessary to satisfy the requirements of the specifications. If appropriate, Contractor shall support all additional cost and nothing shall be charged to Departmental representative.

2.2 EQUIPMENT AND PERSONNEL

- .1 All equipment shall be in perfect condition of use (mechanical, electric, etc.)
- .2 Contractor shall supply all equipment and the necessary workforce to realize all the works according to state of the art and the contractual quality requirements
- .3 Hereafter a non-exhaustive list of Contractor equipment required:
- .1 Paver: one (1) mechanical grade controlled self-powered paver capable of spreading mix up to a width of 5.0 m within specified tolerances, true to line, grade, crown indicated and shall be equipped with electronic controls for laying mix.
- .2 VTM: One (1) transfer material vehicle shall be used for asphalt paving on movement areas (Runway, taxiway and traffic area)..
- .3 Rollers:
- .1 Vibratory rollers: At least two (2) drum steel tandem vibratory rollers
- .1 Minimum drum diameter: 1200 mm.
- .2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.
- .2 Pneumatic roller : minimum one (1) pneumatic roller of type and weight to obtain density of compacted mix
- .4 Tack/Bond-Coating Truck: At least one (1) truck with a flowmeter which control the application rate
- .5 Cold planers: three (3) cold planers being respectively at least 1.0 meter, 0.5 meter and 0.3 meter wide.
- .6 Mechanical Broom Road Sweeper: at least one (1) truck
- .7 Joint-heating: Two (2) infrared joint heaters (one mobile and one permanent on the paver)are required to correct longitudinal joints on the runway, taxiway and apron.
- .8 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
- .1 Boxes with tight metal bottoms.
- .2 Isolated covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
- .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .4 Use only trucks which can be weighed in single operation on scales supplied.
- .9 Hand tools:
- .1 Lutes or rakes with covered teeth for spreading and finishing operations.
- .2 Tamping irons having mass not less than 12 kg and bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.

- .10 Straight edges, 4.5 m in length, to test finished surface. One shall be available full time on site for the Departmental Representative during placing of asphalt. Mobile repair unit truck to repair and/or adjust all equipment on site.
- .4 In addition to all equipment previously listed, Contractor shall have on site these additional equipment to continue work during any equipment fails or breaks. Backup equipment shall be ready to use, in perfect order and with the same characteristics of those in use on the site.
 - .1 One joint pre- heating unit
 - .2 One (1) paver with a permanent infrared joint heating unit
 - .3 One (1) joint-heating
 - .4 One (1) vibratory roller
 - .5 One (1) pneumatic roller
 - .6 One (1) mechanical broom road sweeper
- .5 Plant testing facility: provide laboratory space at plant site for exclusive use of Departmental Representative for performing tests, keeping records and making reports.
- .6 Contractor personnel shall be minimally as followed:
 - .1 A Superintendent and an asphalt paving team with the relevant experience in laying asphalt on airport. The superintendent must be on site full time during asphalt laying.
 - .2 Pavers operators with the relevant experience in laying asphalt on airport.
 - .3 Compactors operators with the relevant experience in laying asphalt on airport.
 - .4 Chief mechanic which can adjust and repair quickly all equipment used on site.
 - .5 The Contractor shall demonstrate during the construction start-up meeting with curriculum vitae to support, the workforce that will carry out the paving work has the relevant experience for laying asphalt on airports.

2.3 HOT-MIX DESIGN

- .1 Mix design to be approved by Departmental Representative. Mix design formula proposed by the Contractor shall be validated and reproduced by the testing laboratory in charge of quality control for approval. Formulas, material including asphalt cement shall be provided at least four (4) weeks prior to beginning of Work.
- .2 Mix design to be developed by testing laboratory approved by Departmental Representative.
- .3 Mix design must be formulated in accordance with Marshall Method to match requirements described in MTMDET standard 4201 reference.
- .4 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.
- .5 Return plant dust collected during processing to mix in quantities acceptable to Departmental Representative.

Part 3 EXECUTION

3.1 PLANT AND MIXING REQUIREMENTS

- .1 Batch and continuous mixing plants:
 - .1 Meet ASTM D995 standards requirements.
 - .2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders. Do not load frozen materials into bins.
 - .3 Feed cold aggregates to plant in proportions to ensure continuous operations.
 - .4 Have calibrated bin gate openings and conveyor speeds to ensure mix proportions are achieved.
 - .5 Before mixing, dry aggregates to moisture content not greater than 1 % by mass or to lesser moisture content if required to meet mix design requirements.
 - .6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
 - .7 Store hot screened aggregates in manner to minimize segregation and temperature loss.
 - .8 Heat asphalt cement and aggregate to mixing temperature directed by Departmental Representative. Do not heat asphalt cement above maximum temperature indicated on temperature-viscosity chart.
 - .9 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, Departmental Representative to approve temperature of completed mix at plant and at paver after considering hauling and placing conditions.
 - .10 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.
 - .11 Mixing time:
 - .1 In batch plants, both dry and wet mixing times as directed by Departmental Representative. Continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30s or more than 75s.
 - .2 In continuous mixing plants, mixing time as directed by Departmental Representative but not less than 45s.
 - .3 Do not alter mixing time unless directed by Departmental Representative.
- .2 Dryer drum mixing plant
 - .1 Meet ASTM D995 standards requirements.
 - .2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.
 - .3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
 - .4 Meter total flow of aggregate by an electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant.
 - .5 Provide for easy calibration of weighing systems for aggregates without having material enter mixer.

- .6 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved. Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time. Difference between this value and amount shown by plant computer system to differ by not more than plus or minus 2%.
- .7 Make provision for conveniently sampling full flow of materials from cold feed.
- .8 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.
- .9 Provide system interlock stop on feed components if either asphalt or aggregate from bin stops flowing.
- .10 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer-mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day.
- .11 Mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 2%.
- .3 Temporary storage of hot mix:
 - .1 Provide mix storage of sufficient capacity (at least 100 metric tonnes) to permit continuous operation and designed to prevent segregation.
 - .2 It is forbidden to store asphalt mix in storage bins in excess of 3 hour.
- .4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.
- .5 Mixing tolerances:
 - .1 Permissible variation in aggregate gradation from job mix (percent of total mass).

5 mm sieve and larger	2.0
80 µm sieve	0.5
 - .2 Permissible variation of asphalt cement from job mix: 0.25%.
 - .3 Permissible variation of mix temperature at discharge from plant: 5 degrees C.
 - .4 Permissible range of asphalt cement: 5.5 % to 5.7%

3.2 PREPARATION

- .1 When paving over existing asphalt surface, clean pavement surface. When levelling course is not required, patch and correct depressions and other irregularities to approval of Departmental Representative before beginning paving operations.
- .2 Apply tack coat in accordance with Section 32 12 13.16 - Asphalt Tack Coat prior to paving.
- .3 Prior to laying mix, clean surfaces of loose and foreign material.

3.3 TRANSPORT OF MIX

- .1 Transport mix to job site in vehicles cleaned of foreign material.

- .2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required. Elevate truck bed and thoroughly drain. No excess solution to remain in truck bed.
- .3 Schedule delivery of material for placing in daylight, unless Departmental Representative approves artificial light.
- .4 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation. Do not dribble mix into trucks.
- .5 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range as directed by Departmental Representative, but not less than 135 degrees C.

3.4 TEST STRIP

- .1 Test strip shall be constructed on taxiway Bravo and on apron prior to asphalt paving on runway 07-25..
- .2 Construct and test test strip to approval of Departmental Representative.
- .3 For airfield pavement, construct test strip at area designated by Departmental Representative to resolve anticipated problems with equipment, mix behaviour or compaction, prior to starting paving operation.
- .4 Adapt compacting method to ensure paving strip which is not conform to required profile has a width less or equal to 300 mm.
- .5 Construct test strip by Departmental Representative instructions, and involving more than one lane, so that joint finishing techniques can be established.
- .6 During construction of test strip, Contractor shall establish optimum rolling pattern by taking nuclear densimeter readings and observations to:
 - .1 Determine sequence and number of passes.
 - .2 Determine correct operating characteristics of vibratory rollers.
 - .3 Determine maximum density of asphalt mix.
 - .4 Ensure smooth surface finish.
 - .5 Establish actual density achieved and air void percentage by coring.
- .7 However, if during the year when will last the works, Contractor doesn't use the same equipment for production or placing and/or if his staff for production or placing is not the same that for the initial test strip, Contractor shall construct, at his own expense, another test strip of 200 tonnes of asphalt concrete on a site approved by the Departmental Representative

3.5 PLACING

- .1 Obtain Departmental Representative approval of base and existing surface and tack coat prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as directed by Departmental Representative.
- .3 Placing conditions:
 - .1 Place asphalt mixtures only when air temperature is above 5 degrees C.

- .2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.
- .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in compacted lifts of thickness as follows:
 - .1 Access road connexion to runway 07-25: ESG-10 surface course in two (2) layers: 40 mm and 50 mm.
 - .2 Runway, traffic area and taxiway: ESG-10 overlay in one layer of 60 mm.
 - .3 For crack repair refer to section 32 01 11.02
- .5 On airport runways and taxiways, traffic area commence spreading at high side of pavement or at crown and span crowned centerlines with initial strip.
- .6 Spread and strike off mixture with self-propelled mechanical finisher.
 - .1 Construct longitudinal joints and edges true to line markings. Departmental Representative to establish lines for paver to follow parallel to centerline of proposed pavement. Position and operate paver to follow established line closely.
 - .2 If Contractor uses pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver. Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
 - .3 Maintain constant head of mix in auger chamber of paver during placing.
 - .4 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
 - .5 Correct irregularities in alignment left by paver by trimming directly behind machine.
 - .6 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.
 - .7 Do not throw surplus material on freshly screeded surfaces.
- .7 When hand spreading for crack repair type B is used:
 - .1 Distribute material uniformly. Do not broadcast material.
 - .2 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
 - .3 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
 - .4 Provide heating equipment to keep hand tools free from asphalt. Control temperature to avoid burning material. Do not use tools at higher temperature than temperature of mix being placed.

3.6 COMPACTING

- .1 Roll asphalt continuously using established rolling pattern for test strip and to density of not less than 100 % of maximum density determined for test strip or at least or equal to 98% of corrected maximum dry density.
- .2 Do not change rolling pattern unless mix changes or lift thickness changes. Change rolling pattern only as directed by Departmental Representative.
- .3 General:
 - .1 Provide at least two (2) rollers and as many additional rollers as necessary to achieve specified pavement density. When more than two rollers are required, one roller must be pneumatic tired type.
 - .2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.
 - .3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.
 - .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness. A sample of asphalt mix must be taken during the production of every quantity of 300 tonnes of asphalt mix produced for the same contract, by the same plant, according to the same final asphalt mix formula. In addition, at least one sample of asphalt mix shall be taken each day.
 - .5 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.
 - .6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
 - .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
 - .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
 - .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side. Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.
 - .10 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.
- .4 Breakdown rolling:
 - .1 Begin breakdown rolling with static steel wheeled roller immediately following rolling of transverse and longitudinal joint and edges.
 - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
 - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. When working on steep slopes or super-elevated sections use operation approved by Departmental Representative.
 - .4 Use only experienced roller operators.

- .5 Intermediate rolling:
 - .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
 - .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.
- .6 Finish rolling:
 - .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by Departmental Representative.
 - .2 Conduct rolling operations in close sequence.

3.7 JOINTS

- .1 General:
 - .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
 - .2 Construct joints between asphalt concrete pavement and Portland cement concrete pavement as indicated.
 - .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
 - .4 Contractor shall pay a particular attention during compacting joints to make sure that these are closed well and that they are uniformly compacted
- .2 Transverse joints:
 - .1 Offset transverse joint in succeeding lifts by at least 600 mm.
 - .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
 - .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.
 - .4 At the junction of paving for phases 3 and 5 on rinway 07-25, Contractor shall construct transverse joints in asphalt pavement. In the area between touchdown zone marking, transverse joints final location shall be shifted for each paving strip at least 2 m measured in runway 07-25 longitudinal direction. Outside the touchdown zone marking, transverse joints for different strip could be aligned.
- .3 Longitudinal joints:
 - .1 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.
 - .1 If cold joint cannot be avoided, remove with asphalt planer previously laid lane to eliminate the round portion, by at least 300 mm, to full depth vertical face, and tack face with thin coat of hot asphalt of adjacent lane.
 - .2 Use an infrared joint heater upstream paver to pre-heat and another joint heater installed directly on the paver which could reach and maintain a minimum temperature of 100°C for the existing joint prior to pave adjacent strip.

- .2 Overlap previously laid strip with spreader by 25 to 50 mm.
- .3 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
- .4 Roll longitudinal joints directly behind paving operation.
- .5 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.

3.8 FINISH TOLERANCES

- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
- .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.9 DEFECTIVE WORK

- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.
- .2 Repair areas showing checking, rippling, or segregation.
- .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean Work area and provide temporary transitions when working in 60 m runway strip length beyond displaced threshold. Contractor shall clean all surfaces with a mechanical vacuum broom sweeper.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment to Section 01 74 11 - Cleaning

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 32 12 16 – Asphalt paving

1.2 MEASUREMENT PROCEDURES

- .1 Pavement marking: measured in square metres of painted surface, for all colors and all shapes to be painted.
- .2 Black aggregates will be measured in square meters of actually covered surface.

1.3 REFERENCES

- .1 Ministère des Transport, de la Mobilité durable et de l'Électrification des transports standards.
 - .1 Tome VII –Matériaux (latest edition).
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.5-99, Low Flash Petroleum Spirits Thinner.
 - .2 CAN/CGSB 1.74-11, Alkyde Traffic Paint.
 - .3 Green Seal Environmental Standards (GS)
 - .1 GS-11-2013, Edition 3.1, Paints and Coatings.
 - .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .5 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .6 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1113-13, Architectural Coatings.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and data sheets for pavement markings and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS.
- .3 Samples:
 - .1 Submit to Departmental Representative samples of these proposed material for approval at least four (4) weeks prior to beginning Work:
 - .1 Two (2) samples of 1 L for each paint type.
 - .2 One (1) sample of black aggregate.
 - .3 Sampling according to Painting Manual from MPI.

- .2 Identify each sample by indicating the name of the project and its location, name and address of manufacturer, type of paint, product number of the MPI, paint formula and lot and batch number.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Paint
 - .1 Alkyd zone/traffic marking with low Volatile Organic Compounds (VOC) in accordance to Ministère des Transports, de la Mobilité Durable et de l'Électrification des transports : standard 10205.
 - .1 Paints: maximum VOC limit 150 g/L.
 - .2 Color: Yellow n°37875 and white n°33538 approved.
 - .3 Upon request, Departmental Representative will supply qualified product list of paints applicable to work. Qualified paints may be used but Departmental Representative reserves right to perform further tests.
- .2 Thinner: Provided by manufacturer.
- .3 Black aggregates (Holding position markings):
 - .1 Black aggregate in Epoxy resin Blackbeauty type, Coal Slag abrasives, Product code 1240, Reed Minerals or equivalent.

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings previously installed under other Sections or Contracts are acceptable for product installation in accordance with MPI instructions prior to pavement markings installation.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.
- .3 Proceed with Work only after unacceptable conditions have been rectified.

3.2 EQUIPMENT REQUIREMENTS

- .1 Paint applicator: approved pressure type mobile with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated.

3.3 APPLICATIONS

- .1 Resin and black aggregate:
 - .1 Black aggregate resin bound shall be applied at a minimum rate of 4kg/l as indicated
- .2 Pavement markings:
 - .1 laid out by Departmental Representative.
 - .2 Unless otherwise approved by Departmental Representative, apply paint only when air temperature is above 10 degrees C, wind speed is less than 60 km/h and no rain is forecast within next 4 hours.
 - .3 Apply traffic paint evenly at rate of 3 m²/L.
 - .4 Do not thin paint unless approved by Departmental Representative.
 - .5 Symbols and letters to dimensions indicated.
 - .6 Paint lines: of uniform colour and density with sharp edges.
 - .7 Thoroughly clean distributor tank before refilling with paint of different colour.

3.4 TOLERANCE

- .1 Paint markings: within plus or minus 5 mm of dimensions indicated.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION OF COMPLETED WORK

- .1 Protect pavement markings until dry.

- .2 Repair damage to adjacent materials caused by pavement marking application.

END OF SECTION

Part 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

- .1 Measure restoration of chain link fence in metres restored.
- .2 Measure supply and installation of new chain link fence with barbed wire in metres installed.
- .3 Measure supply and installation of chain link fence gates with barbed wires as units installed.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-13, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A121-13, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
 - .4 A653/A653M-15, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM C618-15, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - .6 ASTM F1664-(2013), Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
 - .7 ASTM A123/A123M-15, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
 - .2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
 - .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
 - .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
 - .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 CSA International
 - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A3000-F08, Cementitious Materials Compendium.
- .4 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water

- .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .6 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports du Québec – Standards :
 - .1 Norme 3101- Béton de masse volumique normale.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for all items to be replaced: concrete mixes, fences, posts and gates. Product data shall include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 fence and gate materials from any damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with CSA A23.1 and to standard 3101 from Ministère des Transports, de la Mobilité Durable et de l'Électrification des Transports du Québec (MTMDETQ).
 - .1 Concrete: type1, 30 MPa at 28 days.
- .2 Chain-link fence fabric: galvanized chain link with 4 mm diameter steel wire in square shape of 50 mm to CAN/CGSB-138.1.
 - .1 Type 1, ClassA, rigid style, Grade 3.
 - .2 Height of fabric: 2.06 m.
- .3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
- .4 Tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.
- .5 Tie wire fasteners: galvanized steel wire.
- .6 Tension bar: to ASTM A653/A653M, 5 x 19 mm minimum galvanized steel.

- .7 Gates: dimensions as indicated to CAN/CGSB-138.4.
 - .1 Chain Link rigid style.
- .8 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
 - .1 Tension bar bands: 5 x 19 mm minimum galvanized steel.
 - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
 - .3 Overhang tops to provide waterproof fit, to hold top rails and an inward projection to hold barbed wire overhang.
 - .4 Include projection with clips or recesses to hold 3 strands of barbed wire spaced 100 mm apart.
 - .5 Projection of approximately 300 mm long to project from fence at 45 degrees above horizontal.
 - .6 Turnbuckles to be drop forged.
- .9 Organic zinc rich coating: to CAN/CGSB-1.181.
- .10 Barbed wire: 2 mm diameter galvanized steel wire 4 point barbs 125 mm spacing.

2.2 FINISHES

- .1 Galvanizing:
 - .1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.
 - .2 For pipe: 550 g/m² minimum to ASTM A90.
 - .3 For barbed wire: to [ASTM A121, Class 2.
 - .4 For other fittings: to ASTM A123/A123M.

Part 3 Execution

3.1 EXAMINATION

- .1 A joint inspection with the Departmental Representative shall be realized to define limits of fences to be repaired prior to beginning Work.
- .2 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation or repair 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 or repair only after unacceptable conditions have been remedied.

3.2 Replacement of damaged fence sections

- .1 Remove damaged fence sections [as directed by Departmental Representative.
- .2 Erect fence along lines as directed by Departmental Representative and to CAN/CGSB-138.3.

- .3 For post to be replaced, dig up damaged post and excavate post holes as directed by manufacturer.
- .4 Place concrete in post holes then embed posts into concrete to depths indicated.
 - .1 Extend concrete 50 mm above ground level and slope to drain away from posts.
 - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .5 Install fence fabric after concrete has cured, minimum of 5 days.
- .6 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.
 - .1 Install braces on both sides of corner and straining posts in similar manner.
- .7 Install overhang tops and caps.
- .8 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .9 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .10 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.
 - .1 Knuckled selvedge at bottom.
 - .2 Twisted selvedge at top.
- .11 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.
 - .1 Give tie wires minimum two twists.
- .12 Install barbed wire strands and clip securely to lugs of each projection.
- .13 Install grounding rods as indicated.

3.3 INSTALLATION OF GATES

- .1 Install gates in locations as indicated
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of centre gate rest for double gate.
 - .1 Cast gate rest in concrete as directed.
 - .2 Dome concrete above ground level to shed water.

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 - Cleaning.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 31 23 33.01 – Excavating, trenching and backfilling

1.2 MEASUREMENT PROCEDURES

- .1 Preparation of sub-grade for placing of topsoil will not be measured for payment.
- .2 Topsoil stripping will not be measured.
- .3 Measure supplying, placing and spreading topsoil delivered from outside the site in cubic metres as determined from actual surface area covered and depth of topsoil specified.
 - .1 Specified depth of topsoil: measured and approved by Departmental Representative after settlement and consolidation as specified.

1.3 PAYMENT

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

1.4 REFERENCES

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-2005, Guidelines for Compost Quality.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832-R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.5 DEFINITIONS

- .1 Compost:
 - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
 - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminants.
 - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A).

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals :

- .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 QUALITY ASSURANCE

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

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 PRODUCTS

2.1 TOPSOIL

- .1 Topsoil for seeded areas : mixture of particulates, microorganisms 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 3 to 20 % organic matter by weight (dry base).
 - .2 Contain no toxic elements or growth inhibiting materials.
 - .3 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

- .1 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .3 Potassium (K): 75 to 90 micrograms of potassium per gram of topsoil.
 - .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .5 Ph value: [6.5 to 7.5].

- .2 Sand: washed coarse silica sand, medium to coarse textured.
- .3 Limestone:
 - .1 Ground agricultural limestone.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .4 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

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

Part 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as directed by Departmental Representative after area has been cleared of grasses and removed from site.
- .2 Strip topsoil to depths as directed by Departmental Representative.
 - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as directed by Departmental Representative.
 - .1 Stockpile height not to exceed 2 m.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
- .5 Protect stockpiles from contamination and compaction.

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 50 mm diameter and other deleterious materials.

- .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
- .2 Remove debris which protrudes more than 75 mm above surface.
- .3 Dispose of removed material off site.

3.3 AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil [as indicated] to following minimum depths after settlement.
 - .1 [150] mm for seeded areas.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

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 SURPLUS MATERIAL

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

3.7 CLEANING

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

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 MEASUREMENT AND PAYMENT

- .1 Measure hydraulic seeding square metres of actual surface area for:
 - .1 Grass mixture including fertilizer.
 - .2 Areas of blending into existing turf grass will not be measured for payment.
 - .3 Unit price shall include surface watering, material, execution, protection and first care maintenance and incidental expenses.

1.3 REFERENCES

- .1 None

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 15 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 Samples:
 - .1 Submit 0.5 kg container of each type of fertilizer used.
- .5 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Landscape Contractor: to be a Member in Good Standing of Horticultural Trades Association (Association des Paysagistes Professionnels du Québec).
 - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

- .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse [and return] [by manufacturer] of [pallets,] [crates,] [padding,] [packaging materials] as specified in [Construction Waste Management Plan] [Waste Reduction Workplan] in accordance with Section [01 74 21 - Construction/Demolition Waste Management and Disposal] [Section 01 35 21 - LEED Requirements].

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
 - .1 Grass mixture: "Certified", "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".
 - .1 Mixture composition:
 - .1 40% Russian wildrye.
 - .2 30% Creeping Red Fescue.
 - .3 15% Crested wheatgrass Fairway.
 - .4 10% Lupulin..
 - .5 5 % Perennial Ryegrass.
- .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].
- .4 Water: free of impurities that would inhibit germination and growth.
- .5 Fertilizer:
 - .1 To Canada "Fertilizers Act" and Regulations.
 - .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.
- .6 Inoculants: inoculant containers to be tagged with expiry date.

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.

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 section 32 91 19.13 – Topsoil Placement and Grading.
 - .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.

- .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 Seeding shall be executed at beginning of spring or after 15 of August, not later than four (4) weeks prior to thaw period, during the period when the humidity of the ground is sufficient to allow the growth and the seeding
- .2 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.
- .3 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
 - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
- .4 Slurry mixture applied per hectare.
 - .1 Seed: grass mixture 250 kg.
 - .2 Water: Minimum 30,000 L.
 - .3 Liquid Soil Amendment/Micronutrients: 1150 kg
- .5 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.
- .6 Blend application 300 mm into adjacent grass areas or sodded areas to form uniform surfaces.
- .7 Re-apply where application is not uniform.
- .8 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 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean and reinstate areas affected by Work.

3.7 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.
 - .2 Mow grass to 50 mm whenever it reaches height of 70 mm. Remove clippings which will smother grass.
 - .3 Fertilize seeded areas after 10 weeks after germination provided plants have mature true leaves in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles; water in well.
 - .4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
 - .5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
 - .6 Repair and seed again dead and bare spots as determined by Departmental Representative to allow establishment of seed prior to acceptance

3.9 ACCEPTANCE

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

3.10 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
 - .1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
 - .2 Mow areas seeded, remove clippings that will smother grassed areas, as directed by Departmental Representative
 - .3 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 23 33.01 – Excavating, trenching and backfilling.
- .2 Section 31 05 16 – Aggregate materials.

1.2 MEASUREMENT PROCEDURES

- .1 Measure supply and installation of pipe culverts, including excavation, backfilling and realization of the granular bedding in meters for each diameter, type and class of pipe installed.
- .2 No separate measurement will be made for the couplings and fittings required for assembly of steel and plastic pipes.
 - .1 This cost will include, where applicable, the water pumping work necessary.
- .3 Measure supply and installation of beveled end pieces, including excavation, backfilling and realization of the granular bedding in units for each diameter, type and class installed.
 - .1 No separate measurement will be made for the couplings and fittings required for assembly of steel and plastic pipes.
 - .2 This cost will include, where applicable, the water pumping work necessary.

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM C443M-11, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).
 - .4 ASTM D698-12e2, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-Série A257-2014, Standards for concrete pipes and manhole sections.
- .4 U.S. Environmental Protection Agency (EPA) / Office of Water.
 - .1 EPA 832-R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 SUBMITTALS

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

- .2 Samples
 - .1 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.
- .3 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work.
- .4 Certification to be marked on pipe.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 PRODUCTS

2.1 CONCRETE PIPE

- .1 Concrete pipe: conform to NQ 1809-300/2004 (R2007), 300 mm diameter, class V.
- .2 Rubber gaskets conform to CSA A257.

2.2 BEVELED CONCRETE END PIECE

- .1 Beveled end piece: conform to MTQ Standards, 300 mm diameter.
- .2 Rubber gaskets conform to CSA A257.

2.3 GRANULAR BEDDING AND BACKFILL

- .1 Granular bedding and backfill material to Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to NQ 2560-114.

Sieve designation	% passing
112 mm	---
80 mm	---
56 mm	---
40 mm	---
31.5 mm	100
20 mm	75 - 100
14 mm	---
5 mm	30 - 50
1.25 mm	---
0.315 mm	10 - 30
0.080 mm	3 - 8
112 mm	---
80 mm	---

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Before pipe culvert installation, ensure that the state of surfaces / materials previously implemented under other sections or contracts is acceptable and can perform the work in accordance with manufacturer's written instructions.
 - .1 Perform a visual inspection of surfaces and materials in the presence of the Departmental Representative.
 - .2 Inform immediately the Departmental Representative of any unacceptable conditions.
 - .3 Proceed with installation only after correcting the unacceptable conditions.

3.2 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.
- .2 Obtain Departmental Representative 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 minimum thickness of 200 mm of approved granular material on bottom of excavation and compact to minimum 95% of corrected maximum dry density.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

3.4 LAYING CONCRETE PIPE CULVERTS

- .1 Begin pipe placing at downstream end Lay pipe with outside circumferential laps facing upstream.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .3 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

3.5 JOINTS: CONCRETE CULVERTS

- .1 Perform joints with rubber gaskets.
 - .1 Rubber gaskets
 - .1 Install gaskets according to manufacturer's written recommendations.
 - .2 Ensure that the beveled end is inserted into the flanged end.

3.6 BACKFILLING

- .1 Backfill around and over culverts as indicated or as directed by Departmental Representative.

- .2 Place granular backfill material, approved by Departmental Representative, 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% corrected maximum dry density taking special care to obtain required density under haunches.
- .4 Protect installed culvert with minimum 150 mm cover of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.
- .5 Place backfill in unfrozen condition.

3.7 CLEANING

- .1 Cleaning up while and at the end of work: carry out cleaning in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at the end of each working day.

END OF SECTION

Part 1 GENERAL

1.1 MEASUREMENT FOR PAYMENT

- .1 Adjustment of elevated edge lighting adjustment is measured in units of light actually adjusted according to plans or at the request of the Departmental Representative.
- .2 Temporary RTIL light installation is measured in units. The price includes the supply and installation of a support, of a 300W, 6,6A/6,6A transformer, primary and synchronization cables, primary and secondary connectors.
- .3 Displaced threshold lights installation is measured in units. The price includes the support, a 100 W, 6,6A/6,6A transformer and primary cables.

1.2 REFERENCES

- .1 Transport Canada
 - .1 TP 312F-1993(R2005), Aerodrome Standards and Recommended Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for airfield elevated edge lighting and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.

1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for airfield elevated edge lighting for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 of ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Store and protect airfield elevated edge lighting units from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

Part 2 PRODUCTS

2.1 LIGHT - SERIES CIRCUIT

- .1 Light unit – runway, taxiway, and apron edge:
 - .1 Single core cable, annealed copper, stranded, 8 AWG size, insulation and sheath, combined, cross-linked polyethylene, designed for a voltage of 5000 V, meeting the requirements of the CSA Standard C22.2 No. 179.
 - .2 Straight connectors, Type 54 super for primary cable comprising a plug and a socket for connection to the isolation transformer or to achieve a straight junction in a primary size 8 AWG cable CSA approved.
 - .3 Frangible couplings.
 - .4 Isolation transformers conform to CSA C22.2 # 180 6.6 A / 6.6 A, 100 W.
 - .5 Light support.

2.1 RTIL LIGHTS

- .1 System runway identification lights (RTIL) consisting of 2 lights with 2 power supplies.
 - .1 Product to be supplied: FTS 830 Flash Technology ADB Airfield Solution.
- .2 Main power supply for power system series 2.8 to 6,6A, discharge capacitor.
- .3 Auxiliary power supply for power system series 2.8 to 6,6A, discharge capacitor.
- .4 Power Supplies on which can be mounted strobe lights.
- .5 Cable for connection of the strobe lights to the power supplies.
- .6 Cable recommended by the manufacturers, designed for the interconnection of power supplies.
- .7 Teck 90 cable (40 ° C), dual conductors size # 14, copper with PVC jacket and hinged aluminum protection, twisted as recommended by the manufacturer for control between the power supply secondary and primary power supply.
- .8 Temporary support for the power supplies.
- .9 Ground wire, bare copper, size No. 8AWG.
- .10 Flexible Conduit, liquid tight.

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to airfield elevated edge lighting installation.
 - .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.
 - .4 Deliver RTIL lights (including all equipments) to Departmental Representative at the end of Work.

3.2 LIGHT UNIT INSTALLATION AND ADJUSTMENT

- .1 Adjust lights at location indicated on plans or as directed by Departmental Representative.
- .2 Install at locations indicated or as directed by Departmental Representative.
- .3 Install in accordance with Section 34 43 05 – Common Work Results for airfield lighting and as indicated:
 - .1 On conduit anchors.
 - .2 On stake anchors.
 - .3 On transformer pull pit.
 - .4 On base casting.
- .4 Assemble in accordance with manufacturer's written installation instructions.
 - .1 Connect isolating transformer secondary lead to light unit cord assembly by means of disconnecting plug and receptacle.
- .5 Level in accordance with manufacturer's written instructions.
- .6 Install lamp of proper rating as indicated.
- .7 Install coloured filters as indicated.
- .8 Install lens as indicated.
- .9 Install day identification cone as indicated.

3.3 QUALITY CONTROL

- .1 During the permanent connection of the primary connectors on the runway circuit, install heat shrink sleeves as existing.

3.4 CLEANING

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

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by airfield elevated edge lighting installation.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS:

- .1 Section 01 35 43 - Environmental Procedures.

1.2 MEASUREMENT FOR PAYMENT:

- .1 Reprofilng of existing ditches will be measured in metres of channel along centreline. Loading, transportation and disposal off site of cut will be included in the unit price.

1.3 DEFINITIONS

- .1 Rock Excavation:
 - .1 Material excavated from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass.
 - .2 Boulders or rock fragments having individual volume in excess of 1 m³.
- .2 Common excavation: materials of whatever nature, which are not included under definition of rock excavation, including dense tills, hard pan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
- .3 Unclassified excavation: deposits of whatever character encountered in Work.

1.4 SUBMITTALS

- .1 Submit documents and samples required in accordance with Section 01 33 00 - / Submittal Procedures.
- .2 The following information relating to the digging of canals.
 - .1 A description of the method of the work that will be used, including, in particular, the available specifications for construction equipments..
 - .2 A detailed description of the proposed method of digging.
 - .3 A detailed description of the proposed dewatering method.

1.5 ENVIRONMENTAL PROCEDURES

- .1 Provide erosion and sediment control measures to prevent migration of suspended sediments in downstream areas and erosion of on-site soils/sediments during the execution of the work as per requirements of Section 01 35 43 - Environmental Procedures.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Not Used.

Part 3 EXECUTION

3.1 EXCAVATION

- .1 Verification of Conditions: Before the maintenance of waterways, to ensure that the condition of the surfaces and materials previously implemented under other sections or contracts is acceptable.
 - .1 Perform visual inspection of surfaces and materials in the presence of the Departmental Representative.
 - .2 Inform the Departmental Representative immediately.
 - .3 Proceed maintenance work only after correcting the unacceptable conditions.

3.2 EXCAVATION

- .1 Excavate and clean ditches to design lines, grades and cross sections as indicated.
- .2 Do not place excavated materials adjacent to channel in manner that will impede flow of surface water from adjacent land, or cause instability of channel banks.
- .3 Plan dewatering means of excavated areas and ensure their maintenance in place.
 - .1 Remove water gradually as it seeps into the excavated area, without affecting the construction schedule reviewed and accepted by the Departmental Representative.
- .4 Upon completion of excavation, clean and trim site.
- .5 Dispose of excavated materials off site as directed by Departmental Representative.

3.3 CLEANING

- .1 Cleaning during Work: clean in accordance with Section 01 74 11 - Cleaning. Leave the site clean at the end of each working day.
- .2 Final Cleaning: upon completion remove materials and surplus materials, debris, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION