Town of Moosonee
Moosonee Runway 0624 and Taxiway Alpha
Moosonee, Ontario

SPECIFICATIONS

ISSUED FOR TENDER

JUNE 2016

Prepared For:
The Corporation of the Town of Moosonee
5 First Street - P.O. Box 727
Moosonee, ON P0L 1Y0
Ph (705) 336 2731
Fax (705) 336 1275

Prepared By:
Stantec Consulting Ltd.
1331 Clyde Avenue
Ottawa Ontario K2C 3G4

Project: P7161-0132-06 U

Stantec

Bidding and Contract Requirements

Division 01 - General Requirements

---------- END OF SECTION 00 00 00----------

TENDERER'S CHECK LIST

Before submitting your tender, check the following points:

1. Has your tender been signed, sealed and witnessed? _____
2. Have you enclosed the Tender Deposit, i.e. certified cheque or bid bond? (Whichever is required by the Contract Documents). _____
3. Have you signed and sealed the Bid Bond or certified cheque? _____
4. Have you enclosed the Agreements to Bond, signed and sealed by your proposed Surety? _____
5. Have you completed all schedules and prices in the Form of Tender? _____
6. Have you indicated the number of addenda included in the tender price? _____
7. Have you shown the time for completion of the work? (if applicable) _____
8. Have you listed your Sub-Contractors? _____
9. Have you listed your Experience in Similar Work? _____
10. Have you listed your Senior Staff? _____
11. Are the documents complete? _____

Note: Your tender will be informal and may be disqualified if ANY of the foregoing points (if applicable) have not been complied with.

MAKE SURE THAT YOU SEAL THE TENDER IN YOUR ENVELOPE.

---------- END OF SECTION 00 01 00----------

INVITATION TO TENDER

MOOSONEE AIRPORT IMPROVEMENTS
REHABILITATION OF RUNWAY 06-24 & TAXIWAY ALPHA
PROJECT NO. P7161-0132-06 U

Qualified Contractors are invited to submit a tender to complete the Rehabilitation of Runway 06-24 and Taxiway 'A' at Moosonee Airport. Tenders, on supplied forms, will be received at the office of The Corporation of the Town of Moosonee (5 First Street - P.O. Box 727 Moosonee, ON P0L 1Y0) before **11:00 a.m. local time on Friday, June 24, 2016.**

The proposed project includes the following (List is indicative of major contract items only):

- Pulverize, add additional granular, compact and fine grade the existing pavement on Runway 06-24 and Taxiway Alpha
- Place new performance grade asphalt on Runway 06-24 and Taxiway Alpha
- Supply and installation of new duct crossings for future electrical works.

Plans, specifications and tender forms may be obtained from www.merx.com. Documents will be available on June 2, 2016.

A Bid Bond or Certified Cheque in the amount of 10% of the tender price and an Agreement to Bond must accompany each Tender. The successful Tenderer will be required to provide a 50% Performance Bond and a 50% Labour and Material Payment Bond upon execution of the Contract.

There will be a **PRE-BID MEETING/SITE INSPECTION** on **Tuesday, June 7, 2016 at 1:00 pm** at the Moosonee Airport. Attendance at the Pre-Bid Meeting is not mandatory but strongly recommended.

Tender Closing Date: 11:00 a.m. local time on Friday, June 24, 2016.

The lowest or any Tender will not necessarily be accepted. All inquiries and questions should be submitted in **writing** to:

Sheldon Ross
Airport Manager
The Corporation of the Town of Moosonee
1 Airport Road
P.O Box 727
Moosonee, ON
Ph: 705-336-2731 ex#21
Email: sross@moosonee.ca

Maurice Best, P.Eng
Project Manager
Stantec Consulting Ltd.
400-1331 Clyde Ave
Ottawa, ON
Ph: 613-738-6083
Email: maurice.best@stantec.com

---------- END OF SECTION 00 02 00----------

DOCUMENTS ARE AVAILABLE ONLY THROUGH MERX

INFORMATION TO TENDERS

1. GENERAL DEFINITIONS (Refer also to GC 00 70 00 for additional definitions):

1.1. **Contract Documents:** mean the executed Agreement between the Owner and the Contractor, the General Conditions of the Unit Price Contract, Form of Tender - Unit Price, Supplementary Tender Information, specifications, drawings and such other documents as listed in the Form of Agreement including amendments thereto incorporated before the execution of the Contract and subsequent amendments thereto made pursuant to the provisions of the Contract and agreed upon between parties.

1.2. **Working Day:** shall mean any day:

1.2.1. Except Sundays and statutory holidays.

1.2.2. Except a Day as determined on which the Contractor is prevented by weather or conditions resulting immediately thereafter, from proceeding with a Controlling Operation. For the purposes of this definition, this shall be a Day during which the Contractor cannot proceed with at least 60% of the normal labour and equipment force effectively engaged on the Controlling Operation for at least 5 hours.

1.2.3. Except a Day on which the Contractor is prevented from proceeding with the Controlling Operation by reason of:

1.2.3.1. Any breach of the Contract or prevention by the Owner, by any other Contractor of the Owner, or by any employee of any one of them.

1.2.3.2. Non-delivery of Owner supplied materials.

1.2.3.3. Any cause beyond the reasonable control of the Contractor that can be substantiated by the Contractor.

1.3. **Net Amount:** means the sum named in the Form of Tender - Unit Price, excluding Harmonized Sales Tax or GST as applicable.

1.4. **Tender Price:** means the sum named in the Form of Tender - Unit Price including Harmonized Sales Tax or GST as applicable.

1.5. **Town of Moosonee:** means the Owner. The term “Town of Moosonee” may be used interchangeably with the “The Owner” or “Owner”.

1.6. **ENGINEER or CONSULTANT:** Shall mean the Stantec Consulting Ltd. or such other engineering firm may from time to time be duly authorized and appointed in writing by the OWNER to act for the purposes of this tender with the authority and responsibility defined in consultant agreements.

1.7. **Tender Documents:** means Contract Documents supplemented with Information to Tenderers, Geotechnical Reports and bid securities and other documents attached hereto for the purpose of tendering.

1.8. **Contract Price:** as defined under GC1, Section 00 70 00.

1.9. **Tenderer:** means an entity submitting a Tender.

2. A COMPLETE TENDER IS COMPRISED OF THE FOLLOWING:

2.1. Sections 00 33 00 and 00 40 00 with all pages and spaces for entry of information by Tenderers filled in as instructed and with all pages initialed by the Tenderer except those requiring signatures;

2.2. Addenda received by the Tenderer during the Tendering period with each page, sheet or sketch initialed by the Tenderer;

2.3. Tender/Bid Security;

2.4. Agreements to Bond as required;

2.5. Proof of Insurance as required ;

2.6. All other requirements as outlined within these documents; and

2.7. A Tender shall be sealed in a package bearing no mark from which the identity of the Tenderer can be ascertained. Incomplete tenders may be disqualified.

3. THE TENDER PACKAGE SHALL BE ENDORSED:

Tender for: **Moosonee Airport**
Airport Improvements, Rehabilitation of Runway 06-24 and Taxiway 'A',
Project No. P7161-0132-06 U

and shall be addressed to the Owner:

The Corporation of the Town of Moosonee
5 First Street - P.O. Box 727
Moosonee, ON P0L 1Y0
PH (705) 336 2731 Ex. 21

and must be delivered by 11:00 a.m. local time on Friday, June 24, 2016 hereinafter referred to the closing date.

4. INFORMATION CONCERNING CONDITIONS OF THE WORK:

4.1. Tenderers shall carefully examine the contract documents and the worksite, and shall fully inform themselves as to all existing conditions and limitations which will affect the execution of the contract. No consideration will be given after submission of a tender to any claim that there was any misunderstanding with respect to the conditions imposed by the contract.

4.2. In preparation of a tender, Tenderers shall use only those drawings listed in the contract documents that are clearly labelled "issued for tender". Tenderers shall not rely on any documents that are not so labelled.

4.3. Discussions at tender briefings or other oral discussions shall not become a part of the contract documents nor modify the contract documents unless confirmed by addenda issued to all Tenderers before closing.

Before tendering, Tenderers may examine the site of the work and shall have satisfied themselves as to the working conditions, the nature and kind of work to be done, any special risks associated therewith and all other matters which may be necessary in order to form a proper conception under which the work will be required to be performed.

There will be a **PRE-BID MEETING/SITE INSPECTION** on **Tuesday, June 7, 2016 at 1:00pm** at the Moosonee Airport. A sign in sheet will be available and will form a record of attendance. Attendance at the Pre-Bid Meeting is not mandatory but is strongly recommended.

Tenderers shall have personal knowledge of the location of the proposed work and shall have informed themselves as to all the actual conditions and requirements thereof, including labour conditions and labour rules and shall not claim at anytime after execution of the Contract that there was any misunderstanding in regard to such conditions.

When forming their estimates and preparing their tenders, Tenderers shall take full cognizance of the content of all the various documents which will comprise the Contract.

5. ADDENDA

5.1. If there are to be any changes in the work, Tenderers will be informed, prior to the close of the period allowed for receiving tenders, by means of an addendum, a written communication issued by the owner. All addenda shall become a part of the contract documents, and receipt of addenda shall be acknowledged by the Tenderer in the tender.

5.2. Any ambiguities, inconsistencies, or uncertainties in the contract documents which may become apparent to Tenderers when tendering shall be advised in writing to the consultant, Stantec Consulting Ltd.. The consultant will advise all Tenderers simultaneously of any decisions on such matters as necessary by means of addenda (which will be serially numbered) and all addenda issued shall be incorporated in the tender.

5.3. Addenda will not be issued later than two (2) calendar days before the tender closing date.

The particular attention of Tenderers is drawn to the necessity of legibly pricing each and every item in the Schedule of Quantities and Unit Prices in the Form of Tender and individually and similarly correctly adding up the "amount" columns of the exact total amount of the Tender.

All Tenders shall be valid for acceptance for sixty (60) calendar days from the date set for their delivery to the Owner.

The Form of Agreement is included in the Contract Documents at the time of Tendering only for the information of Tenderers and shall not be completed at the time of tendering.

The appending of any qualifying clauses to the Contract Documents or failure to comply with these instructions and with all other relevant provisions contained in the documents in the completing of any tender renders such tender liable to disqualification.

The Tenderer’s attention is drawn to the articles covering Federal and Provincial tax in the General Conditions of the Contract.

Tendered unit prices shall exclude the HST. The HST shall be indicated as a separate amount as indicated. Refer to the General Conditions.

The bonds shall be issued by a company whose guarantee bonds are acceptable to the Government of Canada.

6. EACH TENDERER SHALL SUBMIT WITH THEIR TENDER THE FOLLOWING:

6.1. An Agreement to Bond, executed under its corporate seal, by the surety company from which the Tenderer proposes to obtain the required bond for 50% Performance and the bond for 50% Labour and Material Payment. The surety company shall be authorized to do business in the Province of Ontario.

6.2. The name and address of a chartered Canadian bank or reputable financial firm to vouch for the financial standing of the Tenderer.

6.3. The name and address of the company who will underwrite the insurance required by the Form of Tender and the General Conditions of the Unit Price Contract.

6.4. A certified cheque or a Bid Bond in the amount of 10% of the tender price on the understanding that in the event of this tender not being accepted by the Owner, then this initial deposit will be returned to the undersigned Tenderer either at the time that the Contract is awarded to some other Tenderer, or at the expiration of validity of this tender, whichever is the sooner.

6.5. Particulars of at least three recent similar contracts successfully completed or successfully progressing towards completion.

6.6. A list of equipment to be used including hourly rates.

6.7. A tentative program indicating the manner in which the Tenderer proposes to carry out the operation using the equipment listed in 6.5 above, so as to ensure completion within the period set forth in the Form of Tender. The program shall indicate working hours per day and hours per week.

6.8. A list of Sub-Contractors.

6.9. A list of senior project personnel (include hourly rates for all levels of personnel).

6.10. Other information as required by this Tender Document.

On the written acceptance by the Owner of a Tender, that Tender becomes the Contract and the Tenderer who has submitted it becomes the Contractor. The Contractor will be required to enter into a formal agreement with the Owner following receipt of a written letter of acceptance from the Owner.

The initial deposit of the Contractor will be returned following execution of the Form of Agreement and the provision of the bond for Performance and the bond for Labour and Material Payment. If the Contractor declines or neglects to provide in full, the required Surety Bonds as provided for in the Form of Tender or neglects or refuses to enter the Contract when called upon to do so, the Tenderer's initial deposit or the additional cost of accepting another tender up to a maximum of 10% of the Tender Price whichever is the lesser shall be forfeitable to the Owner as Liquidated Damages, but not by way of penalty and the Contract shall be cancelled.

The initial deposit of the unsuccessful Tenderers will be returned to them as soon as possible after the Contract is awarded or the expiration of validity of their tenders, whichever is the sooner.

The Owner will not defray any expenses whatsoever incurred by Tenderers in the preparation and submission of their tenders.

The Owner reserves the right to reject any or all tenders received and to accept any tender that may be considered to be in the best interest of the owner.

The Owner may allocate preference when, in the opinion of the Owner, expressed by resolution, it is in the interest of the Owner to do so.

Tenders which in the opinion of the Owner are considered to be informal or unbalanced may be rejected.

7. AMENDMENT OR WITHDRAWAL OF TENDER:

7.1. Tenders may be amended or withdrawn by letter, or facsimile prior to date and time of closing. Amendment of individual unit prices is the only acceptable price amendment. Amendments shall not disclose either original or revised total price.

7.2. Head amendment or withdrawal as follows: "[amendment]/[withdrawal] of tender for Moosonee Airport – Project No. P7161-0132-06U". Sign and seal as required for tender, and submit at address given for receipt of tenders prior to time of tender closing.

7.3. Proof of receipt of the written notice will be an acknowledgment by return telegram or facsimile by the owner.

After tenders have been opened, no changes, additions, or deletions to any tender, except those specifically provided for in the tendering conditions shall be made either by or on behalf of the owner, or by or on behalf of the Tenderer.

8. DISCREPANCIES, OMISSIONS AND CONSTRUCTABILITY:

8.1. If a Tenderer finds discrepancies or errors or omissions in the drawings, specifications, or other documents or has any doubt as to the meaning or intent of any part thereof, he shall at once inform the owner. Any necessary changes, or additions, or further explanations, will be made by the owner by issuing an addendum.

8.2. Every request for an interpretation shall be made in writing, and forwarded to the address given on the invitation to tender. Oral discussions, unless confirmed in writing in an addendum, shall not modify the contract documents nor the tendering procedure.

8.3. The Tenderer is responsible for gaining an understanding of the intent of the design as conveyed by the contract documents, adequate to allow the Tenderer to prepare a valid tender. The Tenderer shall be responsible for determining that the work is constructible in accordance with the intent of the design.

9. REQUESTS FOR REVIEW OF EQUIVALENT ALTERNATIVES

9.1. The Tenderer shall submit any requests for review of equivalent alternatives to the owner at least five days prior to the tender closing date.

9.2. Requests for consideration of alternative product shall be submitted in writing and directed to the owner, and shall contain pertinent data such as construction and operation characteristics.

9.3. The owner may allow the alternative, and issue an addendum to the contract, or he may reject the alternative.

9.4. The Tenderer shall use only alternatives that are confirmed by an addendum.

9.5. Whenever alternatives are accepted, the Tenderer shall be responsible for making all consequent adjustments to make the alternative fit into the work as specified, and the consequent costs shall be deemed to be included in the tender price.

9.6. Reviews of equivalent alternatives will be undertaken only after the tender closing date.

9.7. Where the specifications and/or tender specifically state that equivalent alternatives will be considered, the Tenderer may submit with a tender a request for a review of an equivalent alternative for any product so specified.

9.8. In such cases, the request for consideration of an alternative product shall be submitted in writing to the owner and shall contain pertinent data such as construction and operational characteristics.

9.9. The owner may reject the alternative and the Tenderer shall then use the item originally specified. The owner may allow the alternative as a basis for contract award on condition that at review of shop drawings, if the alternative is found not acceptable, the item as originally specified must be used. The Tenderer must assume the risk of obtaining final acceptance.

9.10. Whenever alternatives are accepted, the Tenderer shall be responsible for making all consequent adjustments to make the alternative fit into the work as specified, and these consequent costs shall be deemed to be included in the tender prices.

10. SUBCONTRACTORS

10.1. The Tenderer shall submit in the schedule of subcontractors the names of subcontractors proposed for the work.

10.2. Where the schedule of subcontractors shows specific items of work the Tenderer shall name his subcontractor; or if the work will not be subcontracted he shall so indicate using the words "own forces".

10.3. The subcontractors listed in the tender may not be changed without the written consent of the owner. If the owner so requires, the Tenderer shall be prepared to confirm to the owner the competence of subcontractors prior to their acceptance on the work.

10.4. If at the time of contract award a subcontractor named in the tender is not acceptable to the owner, the Tenderer shall name an alternative subcontractor acceptable to the owner.

11. SUPPLIERS AND MANUFACTURERS

11.1. The Tenderer shall submit in the schedule of suppliers and manufacturers of material and product, the names of manufacturers, and if material and product are obtained through intermediate agents, the agents shall be indicated as the suppliers.

11.2. The suppliers and manufacturers named in the tender shall not be changed without the written consent of the owner.

11.3. If, at the time of contract award a supplier and/or manufacturer named in the tender is not acceptable to the owner, the Tenderer shall name an alternative supplier or manufacturer acceptable to the owner.

12. TENDER GUARANTEE

12.1. The tender shall be accompanied by a bid bond in the amount of 10% of the tender price and a Consent of Surety for the performance bond and labour and materials payment bond, in the amounts specified in the tender invitation. The bid bond and consent of surety shall be provided in an acceptable form by an agency that is acceptable to the owner, and licensed in the jurisdiction of the project.

12.2. The obligation of the tender guarantee shall be that if the owner accepts a tender and the Tenderer refuses to sign the agreement and to provide the specified performance guarantees, then the tender guarantee shall be forfeited to the owner.

12.3. In the event that the owner’s damages arising from default of the Tenderer in failing to perform the contract after acceptance of its tender are greater than the amount of the tender guarantee, the tender guarantee shall not be construed to limit or eliminate the owner’s right to sue for the balance of its damages or for all of its damages and that right may be exercised by the owner in its sole discretion.

13. TENDER EVALUATION

13.1. The owner reserves the right to evaluate tenders on the basis of criteria of its own choice, in its sole discretion, whether previously disclosed to Tenderers or not, provided only that the reasons for selection of a tender shall not be frivolous, irrelevant, or malicious.

13.2. In evaluation of tenders the owner may, but is not obligated to, apply preference for:

13.2.1. An earlier completion date over later;

13.2.2. A contractor deemed by the owner in its sole discretion to be more competent than less competent, (even though both may be competent to perform the work).

13.3. In evaluation of tenders the owner may, but is not obligated to, consider previous or on-going disputes from other contracts, with a Tenderer.

14. ACCEPTANCE OR REJECTION OF TENDERS

14.1. The owner reserves the right to reject any or all tenders, to waive irregularities and informalities at his discretion and to accept the tender that the owner deems to be in its best interest. The lowest tender will not necessarily be accepted. Without limiting the generality of the foregoing, any tender may be rejected for any of the following reasons:

14.1.1. Incomplete tender.

14.1.2. Obscured or irregular erasures or corrections in the schedule of prices.

14.1.3. Prices omitted or unbalanced.

14.1.4. Insufficient or irregular tender guarantees.

14.1.5. Evidence of inadequate experience, or of inadequate capacity to perform the contract, or failure to qualify under conditions of the tendering requirement.

14.1.6. Evidence of previous failure to perform adequately on similar work.

14.1.7. The insertion by the Tenderer of conditions which vary the tendering requirements or the tender forms.

14.2. No action of the owner other than a written "notice of acceptance" shall constitute an acceptance of a tender. Such written notice shall be in the form included in the contract documents (document 00 30 50), or such other form as desired by the Owner, and shall be signed by officials properly authorized by the owner to do so, and either under the seal of the owner, or witnessed, as may be appropriate for the owner.

14.3. The owner reserves its right to negotiate at the time of acceptance, with the lowest Tenderer only, for a lower tender price, or for the removal from the tender of qualifying conditions, or both.

15. COMPLETION DATES

15.1. The Tenderer is advised that the stipulated completion dates set forth in the form of tender are non- negotiable and liquidated damages shall apply for the stipulated completion dates.

16. PROVISIONAL ITEMS

16.1. When it is expected that certain specific items of Work may be required during the course of construction, but the exact requirements of those items of Work will depend on ground conditions or other uncertain factors encountered, such items are shown in the Schedule of Unit Prices in Section 00 33 00 – Form of Tender as Provisional Items. The quantities may vary significantly, or the item may not be used at all, at the sole discretion of the Owner. The Tenderer shall price these items accordingly and shall not claim any anticipated loss of profit or increased overhead if any or all of these items is deleted, or the quantities are significantly amended. These items have been clearly noted as *PROVISIONAL* within the Form Unit Price Table.

17. OPTIONAL WORK

17.1. Tenders are advised that the Schedule of Unit Prices in Section 00 33 00- Form of Tender requires the tender to provide pricing for OPTIONAL WORK. The Owner is currently contemplating whether to include these elements in the project. To aid in this decision making, tenderers are required to provide pricing for **ALL options** where indicated. The Owner will make the final decision on which options to proceed with only after award of the contract. The Owner may make a decision on exercising any or all of the options at any time during the duration of the Contract. The Contractor will only be entitled to payment under the items associated with the selected options. All quantities associated with the rejected options will be deemed to be zero (0.00) and there shall be no payment under those items. The Tenderer shall price these items accordingly and shall not claim any anticipated loss of profit or increased overhead related to the rejected options. These items have been clearly noted as *OPTIONAL* within the Schedule of Unit Price Table.

---------- END OF SECTION 00 10 00----------

PRELIMINARY CONSTRUCTION SCHEDULE

1 PRELIMINARY CONSTRUCTION SCHEDULE

1.1 The work shall be scheduled in accordance with the following project milestone dates. See Section 01 10 10 and drawing C-020 for description of work.

Substantial Completion: No later than October 15, 2016

1.2 The Contractor is expected to work a minimum of six (6) days per week.

1.3 The Contractor shall submit a preliminary construction schedule to the Contract Administrator for review no later than five (5) days after notification of award. The preliminary construction schedule shall include the scheduling restrictions as noted in this section.

1.4 Hours of work shall be the responsibility of the contractor and shall be in accordance with any local codes, statutes, by-laws or ordinances regarding noise.

1.5 Notwithstanding the requirements set forth in this section, the contactor shall have unrestricted access to the work site.

1.6 Notwithstanding the requirements set forth by Airport Management and in accordance with 01 10 10, the Contactor shall have unrestricted access to the work site. The Contractor shall ensure public access remains unrestricted to all facilities bordering the work site during airport and tenant operational hours. Any restricted or obstructed access during non-operational hours must be communicated to the affected users minimum 48 hours in advance. Hours of work shall be the responsibility of the contractor and shall be in accordance with any local codes, statutes, by-laws or ordinances regarding noise.

---------- END OF SECTION 00 21 00----------

EXISTING SITE CONDITIONS

1 EXISTING SITE CONDITIONS

1.1 The Contractor declares that in tendering for the works and in entering into this Contract, he has either investigated for himself the character of the work and all local conditions that might affect his tender or his acceptance of the work, or that not having so investigated, he is willing to assume and does hereby assume all risk of conditions arising or developing in the course of the work which might or could make the work, or any items thereof, more expense in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the Contract signed.

1.2 The Contractor also declares that he did not and does not rely upon information furnished by any methods whatsoever by the Owner or its officers or employees, being aware that any information from such sources was and is approximate and speculative only, and was not in any manner warranted or guaranteed by the Owner.

1.3 This investigation shall include at a minimum, factoring the restrictions and/or limitations related to the delivery of materials and equipment via rail to Moosonee, and airport site access via a municipal bridge (Width 12.5 ft, max load weight 34 Tonne).

1.4 Tenderers are encouraged to visit the site and examine site conditions before submitting a Tender, and shall make their own estimate of the facilities and difficulties that may be encountered and of the nature of the subsurface conditions. The Tenderer shall not claim at any time after submission of the Tender that there was any misunderstanding of the terms and conditions of the Contract related to site conditions.

1.5 Tenderers may make tests, inspections and measurements, but such investigations must be performed under time schedules and arrangements with the Owner and Tenderers must comply with the Owner's requirements.

1.6 Tenderers must make prior arrangements with the Moosonee Airport for all site visits and inspections.

Sheldon Ross
Airport Manager
The Corporation of the Town of Moosonee
1 Airport Road
P.O Box 727
Moosonee, Ont
Ph: 705-336-2731 ex#21
Email: sross@moosonee.ca

1.7 Where geotechnical information has been made available by the Owner for reference by the Tenderers, the Tenderers shall make their own interpretations of the information and opinions expressed in such report, particularly with respect to the implications of the site geotechnical conditions on their ability to perform, in the timeframe specified, the Work of the Contract for which the Tender is being submitted. The Owner, Engineer or author of the report will not be responsible for the accuracy of the information or the manner in which the information is used or interpreted.

---------- END OF SECTION 00 30 50----------

NOTICE OF ACCEPTANCE

1 WRITTEN NOTICE OF ACCEPTANCE

The tender of Moosonee Airport – Runway 06-24 and Taxiway 'A', PROJECT NO. P7161-0132-06 U.

For the project entitled Moosonee Airport – Runway 06-24 and Taxiway 'A', PROJECT NO. P7161-0132-06 U to perform the work described in the plans, specifications and addenda issued for the project.

For the total contract price (including HST) of: $_____dollars. Submitted to the Corporation of the Town of Moosonee (Owner).

On Friday, June 24, 2016 at 11:00 a.m. local time,

Is hereby accepted on this date: _____

Authorization

This notice of acceptance is authorized by the Corporation of the Town of Moosonee: (Owner)

Signature of the Owner	(Seal)
Name	

---------- END OF SECTION 00 30 50----------

FORM OF TENDER

UNIT PRICE BID FORM

Project/Contract: Moosonee Airport Improvements - Runway '06-24' and Taxiway 'A' Rehabilitation

Project/Contract No.: ACAP Project No. P 7161-0132-06 U
Stantec Consulting 163301858

From (Bidder): _____
company name

_____
street address or postal box number

_____
city/town, province, and postal code

To (Owner): Town of Moosonee, Ontario

We, the undersigned, having examined the Bid Documents for the above-named project/contract, including Addendum Number(s)_____, and having visited the Place of the Work, hereby offer to perform the Work in accordance with the Bid Documents, for the Unit Prices set out in the Schedule of Prices. The Unit Prices are in Canadian dollars and exclude Value Added Taxes. It is understood that:

(a) the quantities in the Schedule of Prices are estimated and may vary,

(b) the Unit Prices and actual quantities will form the basis for payment of the Contract Price,

(c) the total amount of our bid is the estimated Contract Price, which is the sum of all unit price extensions, including any lump sum, and allowance items,

(d) the extensions of unit prices and addition of unit price extensions, including any lump sum and allowance items, will be checked by the Consultant and where arithmetical errors are discovered, the Unit Prices will be considered as representing our intentions, and the Unit Price extensions and total amount of our bid will be corrected accordingly.

We, the undersigned, declare that:

(a) we agree to perform the Work within the required completion time specified in the Bid Documents,

(b) we have arrived at this bid without collusion with any competitor,

(c) this bid is open to acceptance by the Owner for a period of sixty (60) days from the date of bid closing, and

(d) all bid form supplements called for by the Bid Documents form an integral part of this bid.

SCHEDULE OF PRICES

Item No.	Description of Work	Unit	Estimated Quantity	Unit Price	Extended Amount
G.1	General Requirements	LS	1	$_____	$_____
G.2	Construction Facilities (Site Trailers)	LS	1	$_____	$_____
G.3	Mobilization	LS	1	$_____	$_____
G.4	Demobilization	LS	1	$_____	$_____
G.6	Project Sign	LS	1	$_____	$_____
G.7	Erosion and Sediment Control Plan, S.P.	LS	1	$_____	$_____
C.1	Common Excavation	m^3	4,000	$_____	$_____
C.2	Pulverize the existing asphalt, mix with the underlying granular base (300mm Depth) (Includes regrading)	m^2	48,200	$_____	$_____
C.3	Additional Granular Subbase (OPSS Granular A)	m^3	1,500	$_____	$_____
C.4	HMAC Pavement - 100mm (2 equal lifts) (Airfield Mix)	m^2	48,200	$_____	$_____
C.5	Asphalt tack coat	m^2	48,200	$_____	$_____
C.6	Pavement Markings (White)	m^2	3,000	$_____	$_____
C.7	Pavement Markings (Yellow)	m^2	500	$_____	$_____
C.8	Protection of Existing Airfield Lighting	LS	1	$_____	$_____
C.09	4X100mm dia Concrete Encased Duct Bank	lm	140	$_____	$_____
C.10	Runway/Taxiway 'A' Edge Light Adjustment	Each	20	$_____	$_____
C.11	Runway/Taxiway 'A' Edge Light Pullpit Adjustment	Each	20	$_____	$_____
				CONSTRUCTION SUB-TOTAL	$_____

Signatures:

Signed and submitted by:

_____
company name

_____
name and title of authorized signing officer

_____
signature of authorized signing officer

_____
name of witness

_____
signature of witness

_____
name and title of authorized signing officer

_____
signature of authorized signing officer

_____
name of witness

_____
signature of witness

Dated this _____ day of _____, 20_____

Note: Affix corporate seal as required by Bid Documents.

Tenderer's Initials and date

---------- END OF SECTION 00 33 00----------

Tenderer's Initials and date

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Tenderer's Initials and date

SUPLEMENTARY TENDER INFORMATION

1 CONTENT OF SUPPLEMENTARY TENDER FORMS

1.1 The Schedules in the Supplementary Tender Forms are offered for information and are subject to review by the OWNER, who may require these Schedules to be modified before the award of the CONTRACT. Modifications may be required for good cause, including but not limited to:

1.1.1 unbalanced breakdown prices.

1.1.2 unacceptable SUBCONTRACTORS or Suppliers and Manufacturers.

1.1.3 unacceptable Force Account Rates.

1.1.4 unacceptable provisional unit prices.

1.1.5 unacceptable supervisory personnel.

1.1.6 other causes.

1.2 The CONTRACTOR warrants that all of the information given in these Schedules is current and correct. Changes to any schedule in the supplementary Tender Forms, agreed upon by the OWNER and the CONTRACTOR, after closing of the Tender Period but before Contract Award shall not in any way affect the Validity of the Tender.

1.3 Upon acceptance by the OWNER, all Schedules in the Supplementary Tender Forms shall become a part of the CONTRACT DOCUMENTS.

2 SCHEDULE OF FORCE ACCOUNT RATES

2.1 The CONTRACTOR offers to do force account work for the following rates for personnel and equipment. Equipment rates include operator, fuel, maintenance, profit and overhead. Personnel rates include payroll cost of labour, all payroll burdens, room and board, if applicable, overhead and profit. The cost of superintendents, time keepers, and other administrative and supervisory personnel and their vehicles are included in overhead. The cost of Bonding and Insurance is included in overhead.

2.2 The CONTRACTOR understands that the OWNER may review these Force Account Rates and require changes for good cause.

2.3 The CONTRACTOR may attach additional work sheets to add to the tables below.

Tenderer's Initials and date

EQUIPMENT:		
Description and Make	**Model and Size**	**Hourly Rate**

PERSONNEL:		
Occupation Or Trade	**Hourly Rate**	**Overtime Rate**

Tenderer's Initials and date

3 SCHEDULE OF LABOUR RATES

3.1 The Schedule is provided for changes to the work pursuant to General Conditions of the Contract:

Position	**$/Hour**	**Position**	**$/Hour**

Tenderer's Initials and date

4.0 REFEREE AS TO TENDERER'S FINANCIAL STATUS:

Name _____

_____

Address _____

_____

Telephone _____

5.0 NAME AND ADDRESS OF COMPANY WHO HAS AGREED TO UNDERWRITE THE BONDS FOR PERFORMANCE AND FOR LABOUR AND MATERIAL PAYMENT.

Name _____

_____

Address _____

_____

Telephone _____

6.0 NAME AND ADDRESS OF COMPANY WHO HAS AGREED TO UNDERWRITE INSURANCE ON THIS CONTRACT AND THE TYPE AND AMOUNT OF INSURANCE.

Name _____

_____

Address _____

_____

Telephone _____

Type of Insurance	Amount

Tenderer's Initials and date

7 PARTICULARS OF TENDERER'S RECENT CONTRACTS:

7.1 The Tenderer shall furnish particulars of at least three, and if possible, five (5) similar contracts successfully completed or currently being carried to completion. The projects quoted must be approximate in nature to the Works now tendered for and be of comparable or greater size (attach additional reference pages to the Tender as required).

Project 1	**Date Completed**	**Contract Value**
Brief Description		

Project 2	**Date Completed**	**Contract Value**
Brief Description		

Project 3	**Date Completed**	**Contract Value**
Brief Description		

Project 4	**Date Completed**	**Contract Value**
Brief Description		

Tenderer's Initials and date

8.0 LIST OF EQUIPMENT TO BE USED ON THIS PROJECT (TO INCLUDE: DESCRIPTION, SIZE OR CAPACITY, CONDITION, AGE AND PRESENT LOCATION)

9 TENTATIVE PROGRAM OF WORKS:

9.1 The Tenderer shall attach hereto or insert a brief outline of the proposed method of operation to ensure completion in the period set forth in the Form of Tender. Attach a separate page if required.

10 LIST OF SUB-CONTRACTORS TO BE USED:

10.1 The Tenderer's attention is drawn to the General Conditions of the Contract - ASSIGNMENT AND SUB-CONTRACTING. The Tenderer shall enter the name and address of each Sub-Contractor used in making up the tender. Only one Sub-Contractor shall be named for each part of the work to be sublet.

10.2 After the tender has been accepted by the Owner, the Contractor shall not be allowed to substitute other sub-contractors in place of those named in the tender without written approval from the Consultant.

Tenderer's Initials and date

Subtrade:	Name and Address
Scope of Work:	Value of Work:

Subtrade:	Name and Address
Scope of Work:	Value of Work:

Subtrade:	Name and Address
Scope of Work:	Value of Work:

Subtrade:	Name and Address
Scope of Work:	Value of Work:

Tenderer's Initials and date

11.0 LIST OF PROPOSED SUPPLIERS OF PROJECT MATERIALS/PRODUCTS INCLUDING NAME AND MATERIALS/PRODUCTS TO BE SUPPLIED:

12 SENIOR PROJECT PERSONNEL:

12.1 The Tenderer shall include below, the names, qualifications and previous experience of those people who will be directly involved with the project. The names shall, for example, include foreman, superintendent, project engineer and/or project manager. The Tenderer shall provide detailed resumes/curricula vitae of these people if so requested.

Name	Title	Related Experience

---------- END OF SECTION 00 40 00----------

Tenderer's Initials and date

FORM OF AGREEMENT

Runway 06-24 and Taxiway 'A'
PROJECT NO. P7161-0132-06 U

THIS AGREEMENT made this _____ day of _____ 2016

BETWEEN

_____

(hereinafter called the "Contractor")

OF THE FIRST PART

- and -

The Corporation of the Town of Moosonee

(hereinafter called the "Owner")

OF THE SECOND PART

WITNESSETH AS FOLLOWS:

1. The Owner intends that the Works comprised in this Contract be constructed and has accepted a Tender by the Contractor for the construction, completion, testing and maintenance of the Works.
2. In consideration of the covenants and agreements hereinafter contained and to be performed by the Owner, the Contractor HEREBY AGREES with the Owner to do the following work:
   - 2.1. To find and supply all the plant, material, labour and workmanship necessary to fulfil the work specified in this agreement, on the terms and conditions herein contained, and to do the same at the rates herein specified.
   - 2.2. To commence and actively proceed with the work of the Contract within fifteen (15) days of the date of receiving written notice from the Consultant to proceed with the said work and to complete all work under this agreement within

     Thirty (30) Calendar Days
3. The Contractor agrees that time shall be construed as being of the essence of the Contract.
4. In this Form of Agreement, words and expressions shall have the same meaning as are respectively assigned to them in the General Conditions of the Unit Price Contract hereinafter referred to.
5. The following documents prepared Stantec Consulting Services, Inc. for the construction of the Works shall be deemed to form and be read and construed as part of this Form of Agreement:
   - 5.1. The said Tender
   - 5.2. The General Conditions of the Contract
   - 5.3. The Specifications of Works
   - 5.4. The Drawings

5.5. Addendum/Addenda No. (s)_____

6. It is agreed that the Contractor has personal knowledge of the location of the proposed works and is informed as to the actual conditions and requirements thereof including labour conditions and labour rules, and shall not claim at any time after the execution of the Contract that there was a misunderstanding in regard to such conditions and requirements.

7. In consideration of the payments to be made by the Owner to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Owner to construct, complete, test and maintain the works in conformity in all respects with the provision of the Contract.

8. The Owner hereby covenants to pay to the Contractor in consideration of the construction, completion, testing and maintenance of the work in good and lawful money of Canada for a Tender Price of:

_____

or such other sums as may be ascertained in accordance with the Contract at the times and in the manner prescribed in the Contract.

The above includes ALL TAXES in the amount of: _____

9. It is agreed that the quantities shown in the Form of Tender, Schedule of Quantities and Unit Prices are estimated quantities of the work only and they are not to be taken as the final and correct quantities of the works to be executed by the Contract and that payment will be made on the basis of the unit prices and lump sums tendered applied to the measured quantities of work finally carried out and further that these unit prices cover all the Contractor's obligations and liabilities under the Contract.

10. The Contractor shall give to the Owner liquidated damages in the amount $500 per day for project management, engineering, security and escorts for each calendar day during the Period of Delay for the entire project as specified in the General Conditions of the Unit Price Contract. Liquidated damages will be deducted from the Contractor's Payment Certificates.

    Liquidated damages will be deducted form the Contractor's Payment Certificates.

11. All grants, covenants, provisos, and claims, rights, powers, privileges and liabilities contained in this Form of Agreement shall be read and held as made by and with and granted to and imposed upon respective parties hereto and their respective heirs, executors, administrators, successors and assigns, in the same manner as if the words "heirs, executors, administrators, successors and assigns" had been inscribed in all proper and necessary places, and in the event of more than one person being the Contractor the said grants, provisos, and claims, rights, powers, privileges and liabilities shall be construed and held to be several as well as joint.

12. Whenever the singular and masculine is used throughout this Form of Agreement and other Contract Documents, the same shall be construed as meaning the plural or feminine or body corporate, as the context or the parties hereto so require.

IN WITNESS WHEREOF the parties hereunto have caused these presents to be executed, the day and year first above written.

SINGED, SEALED AND DELIVERED BY)
Witness in the presence of:)
)
_____)
)
)

_____
(The Corporation of the Town of Moosonee)

_____
(Date)

SINGED, SEALED AND DELIVERED BY)
Witness in the presence of:)
)
_____)
)
)

_____
(Contractor)

_____
(Date)

---------- END OF SECTION 00 53 00----------

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GENERAL CONDITIONS

1. DEFINITIONS

1.1. The contents of the CONTRACT DOCUMENTS are limited to:

1.1.1. Contract Forms:

1.1.1.1. the TENDER Forms

1.1.1.2. the Supplementary TENDER Forms

1.1.1.3. Notice of Acceptance

1.1.1.4. the AGREEMENT

1.1.1.5. the Performance Bond

1.1.1.6. the Labour and Materials Payment Bond

1.1.2. Conditions of the Contract:

1.1.2.1. the General Conditions

1.1.2.2. the Supplementary General Conditions;

1.1.3. Drawings;

1.1.4. Specifications;

1.1.5. Appendices;

1.1.6. Addenda;

1.1.7. Field Orders;

1.1.8. Change Orders.

1.2. The following definitions shall apply throughout the CONTRACT DOCUMENTS:

1.2.1. The term OWNER means the person named as the owner in the Form of Agreement and the legal successors in title to this person.

1.2.2. The term ENGINEER or CONSULTANT shall mean Stantec Consulting Services, Inc. or such other engineering firm as may from time to time be duly authorized and appointed in writing by the OWNER to act for the purposes of this CONTRACT within the authority and responsibility defined in the CONTRACT DOCUMENTS.

1.2.3. The term THE WORK shall mean the entirety of the work described in these contract documents, including MATERIAL, PRODUCT, labour, PLANT, transportation and other facilities and items ancillary to the foregoing required to furnish and perform the CONTRACT by the CONTRACTOR in accordance with the intent of the design as expressed in the CONTRACT DOCUMENTS.

1.2.4. The term THE PROJECT shall mean the total construction contemplated by the OWNER, of which THE WORK may be the whole or only a part.

1.2.5. The term WORKSITE shall mean the spatial limits within which THE WORK is located, during the period of performance of THE WORK from the date of Notice to Proceed to the date of the CONSTRUCTION COMPLETION CERTIFICATE.

1.2.6. The term CONTRACTOR'S SUPERINTENDENT shall mean an employee or representative of the CONTRACTOR who is specifically authorized to be in full charge of the CONTRACTOR's operations at the WORKSITE and is so designated in writing by the CONTRACTOR to the OWNER.

1.2.7. The term SUBCONTRACTOR shall mean a person neither contracting with nor employed directly by the OWNER for doing any of THE WORK, but contracting with or being employed directly by the CONTRACTOR, provided however that the term SUBCONTRACTOR shall not include one who merely supplies MATERIAL or PRODUCT for THE WORK to the CONTRACTOR.

The term CONTRACTOR'S PROJECT MANAGER shall mean a representative of the CONTRACTOR, superior to the CONTRACTOR'S SUPERINTENDENT, who has authority to issue QUOTATIONS for CONTEMPLATED CHANGE, to sign CHANGE ORDERS and to act on behalf of the CONTRACTOR both at and away from the WORKSITE with respect to the CONTRACT.

1.2.8. The term OTHER CONTRACTOR shall mean any person, firm or corporation employed by the OWNER on the site of THE PROJECT other than through the CONTRACTOR.

1.2.9. The term CONTRACT PRICE shall mean the total amount of the CONTRACT as defined in the AGREEMENT, adjusted during the course of THE WORK as required by these CONTRACT DOCUMENTS.

1.2.10. Certificates

1.2.10.1. The term PROGRESS PAYMENT CERTIFICATE shall mean a claim for payment for work done, prepared by the CONTRACTOR, reviewed and certified by the ENGINEER, upon which payment on account is made periodically by the OWNER.

1.2.10.2. The term CONSTRUCTION COMPLETION CERTIFICATE shall mean a certificate issued by the ENGINEER upon full completion of THE WORK, including cleanup and rectification of all deficiencies.

1.2.10.3. The term FINAL CERTIFICATE shall mean the certificate issued by the ENGINEER on behalf of the OWNER or by the OWNER, only at the request of the CONTRACTOR, after expiry of the WARRANTY PERIOD, provided that the conditions of the CONTRACT have been met.

1.2.11. The term WARRANTY PERIOD shall mean the period beginning on the date specified in the "CONSTRUCTION COMPLETION CERTIFICATE," and ending after all conditions of the CONTRACT have been met, and the specified period has expired.

1.2.12. The term FIELD ORDER (F.O.) shall mean a written communication from the OWNER, or from the ENGINEER on behalf of the OWNER, to the CONTRACTOR, clarifying the CONTRACT DOCUMENTS, issuing additional instructions, requesting information, or ordering a change in THE WORK within the general scope of THE WORK.

1.2.13. The term CHANGE ORDER shall mean a written communication issued by the OWNER, with the agreement of the CONTRACTOR, setting forth the authorized amount and time to be added to or deducted from the CONTRACT PRICE on account of changes in THE WORK described by a NOTICE OF CONTEMPLATED CHANGE and subsequent correspondence.

1.2.14. The term NOTICE OF CONTEMPLATED CHANGE (NCC) shall mean a written communication from the ENGINEER, on behalf of the OWNER, describing a contemplated change in THE WORK and requesting a quotation, complete with a narrative description of the details of the work to be done by the CONTRACTOR to achieve the intent of the contemplated change.

1.2.15. The term QUOTATION FOR CONTEMPLATED CHANGE (QCC) shall mean a written proposal by the CONTRACTOR to the OWNER for doing the work required to achieve the contemplated change, including both cost and time implications for doing the work.

1.2.16. The term PLANT shall mean collectively all tools, implements, machinery, vehicles, structures, equipment and other things required for the execution of THE WORK, and provided by the CONTRACTOR.

1.2.17. The term MATERIAL shall mean collectively all materials and commodities required to be furnished under the CONTRACT for THE WORK except those specifically provided for otherwise in the CONTRACT DOCUMENTS.

1.2.18. The term PRODUCT shall mean collectively machinery or assembled components specifically provided for THE WORK and standard PRODUCT such as motors, pumps, etc. designed and produced for a specific use.

1.2.19. The term "PROVIDE" shall mean supply and install.

1.3. Words importing the singular only shall also include the plural and vice-versa, where the context requires.

1.4. MATERIAL, PRODUCT, PLANT or methods described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized meaning.

2. AGREEMENT

2.1. The AGREEMENT shall be signed in Quadruplicate by the OWNER and the CONTRACTOR.

3. ORDER OF PRECEDENCE

3.1. The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in according with the following sequence:

3.1.1. The Contract Agreement

3.1.2. The Letter of Acceptance

3.1.3. Pre-Award Contract Amendments Letter

3.1.4. The Addenda

3.1.5. The Tender

3.1.6. The Special Provisions

3.1.7. The General Conditions

3.1.8. The Specifications

3.1.9. The Drawings

4. DRAWINGS AND INSTRUCTIONS

4.1. The OWNER will furnish to the CONTRACTOR three (3) working copies of the CONTRACT DOCUMENTS.

4.2. A current set of the complete CONTRACT DOCUMENTS, in good order, shall be kept at the WORKSITE and shall be available there to the ENGINEER and the OWNER.

4.3. All drawings, specifications and copies thereof furnished by the ENGINEER are his property. They shall not be used on other work and, with the exception of the signed CONTRACT DOCUMENT set, are to be returned to the ENGINEER on request, upon completion of THE WORK.

4.4. All models prepared by the ENGINEER for the OWNER's use and paid for by the OWNER, are the property of the OWNER, and not the CONTRACTOR, unless specifically agreed otherwise.

5. REFERENCE POINTS AND LAYOUT

5.1. The ENGINEER will establish reference points for the location of principal components of THE WORK as well as bench marks in reasonable proximity to THE WORK.

5.2. The CONTRACTOR shall be responsible for protection and preservation of the reference points and stakes, and legal survey pins, and in case of wilful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their loss or disturbance.

5.3. The CONTRACTOR shall provide all detailed layout of dimensions, locations, and elevations of THE WORK from the reference points and bench marks set by the ENGINEER.

5.4. The CONTRACTOR shall not proceed with THE WORK until he has received from the ENGINEER such reference points, elevations, and other points and instructions as are required for the execution of THE WORK.

5.5. The CONTRACTOR shall, before commencing work at any point, satisfy himself as to the meaning and correctness of all stakes and instructions. No claims shall be considered for any allowance based on alleged inaccuracies, failure to read reference points correctly, or failure to interpret instructions correctly.

5.6. If the CONTRACTOR, in the course of executing THE WORK, finds any discrepancy between the drawings and the physical conditions of the locality, or any errors, omissions or discrepancies in drawings or in the layout as given by points and instructions, he shall inform the OWNER immediately in writing, and the OWNER or the ENGINEER shall promptly verify the same and issue appropriate instructions. Any work done after discovery of errors, omissions or discrepancies, before further work is authorized, will be done at the CONTRACTOR'S risk.

6. THE ENGINEER AND THE CONTRACTOR

6.1. The ENGINEER shall administer the CONTRACT and shall, in the first instance, be the interpreter of the CONTRACT and shall assess the adequacy of performance by the Parties.

6.2. The ENGINEER shall provide full time resident services at the WORKSITE and general engineering services for THE WORK.

6.3. The duties, responsibilities and limitations of authority of the ENGINEER are defined in the CONTRACT DOCUMENTS and they may not be changed except with the written consent of the OWNER, the CONTRACTOR and the ENGINEER. They are delegated to the ENGINEER by the OWNER.

6.4. The efforts of the ENGINEER shall be directed to reviewing construction progress, providing interpretation of the CONTRACT DOCUMENTS, where required, and assisting in the expeditious carrying out of THE WORK.

6.5. The ENGINEER does not guarantee the CONTRACTOR's work nor undertake to check the quality and quantity of work on behalf of the CONTRACTOR. The ENGINEER is not responsible to the CONTRACTOR for discovering defects in THE WORK nor for advising the CONTRACTOR of defects in THE WORK.

6.6. The CONTRACTOR shall bring to THE WORK the expertise, skill and experience required for the execution of THE WORK.

6.7. During the course of execution of THE WORK, if the CONTRACTOR becomes aware of any error, discrepancy or omission in the drawings or the specifications, the CONTRACTOR shall immediately notify the ENGINEER in writing and request instructions. The CONTRACTOR shall not proceed any further with that portion of THE WORK until he has received such instructions in writing from the ENGINEER.

6.8. The ENGINEER may, by FIELD ORDER, put a "hold" on any portion of THE WORK while an error, discrepancy or omission, whether discovered by the CONTRACTOR or the ENGINEER, is investigated. Such a "hold" order shall not constitute a basis for a claim by the CONTRACTOR for delay, unless and until it critically affects the performance of THE WORK and the Schedule for Completion of THE WORK.

6.9. The CONTRACTOR shall have complete control of THE WORK and shall direct and supervise THE WORK to ensure conformance with the intent of design as expressed in the CONTRACT DOCUMENTS. The CONTRACTOR shall be solely responsible for construction means, methods, techniques, sequences and procedures, and for coordinating the various aspects of THE WORK under the CONTRACT. The CONTRACTOR shall have determined that THE WORK is constructible.

6.10. The CONTRACTOR shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities, and for the design and execution of methods required in their use.

6.11. When required by law or by the CONTRACT, the CONTRACTOR shall engage and pay for registered professional engineering personnel to perform the design of temporary facilities and methods of execution to ensure safety and satisfactory performance.

6.12. When required by the Specifications or drawings, the CONTRACTOR shall submit to the ENGINEER a written description and Drawings to show its proposed methods and means for doing certain specified items of THE WORK. These submissions are to be made to allow the ENGINEER on the OWNER's behalf to:

6.12.1. determine the general conformance of the proposed means and methods with the intent of the design;

6.12.2. determine whether there are or could be any serious affects of a permanent nature on THE WORK, the WORKSITE, or the contiguous area outside the Worksite.

6.13. The OWNER, or the ENGINEER in the OWNER's behalf may, but they are not obligated to, comment, give approval or with hold approval of the proposed means and methods.

6.14. The OWNER may stop the CONTRACTOR from implementing the proposed means and methods by issuing a FIELD ORDER.

6.15. The CONTRACTOR shall employ a competent CONTRACTOR'S SUPERINTENDENT who shall be in attendance at the WORKSITE while THE WORK is being performed. The CONTRACTOR'S SUPERINTENDENT shall be acceptable to the OWNER and shall not be removed or changed without good reason, and then only with the approval of the OWNER.

6.16. The CONTRACTOR'S SUPERINTENDENT shall represent the CONTRACTOR at the WORKSITE and additional instructions given to him by the ENGINEER shall be deemed to have been given to the CONTRACTOR.

6.17. Nothing contained in the CONTRACT DOCUMENTS shall be construed to form any contractual obligation between the ENGINEER and the CONTRACTOR.

7. SUBCONTRACTORS

7.1. The CONTRACTOR shall preserve and protect the rights of the OWNER with respect to all work performed under the Contract and shall:

7.1.1. Require all SUBCONTRACTORS to perform work in accordance with and subject to the terms and conditions of the CONTRACT;

7.1.2. Be as fully responsible to the OWNER for acts and omissions of SUBCONTRACTORS and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the CONTRACTOR;

7.1.3. Incorporate all terms and conditions of the CONTRACT DOCUMENTS into all Subcontract Agreements he enters into with his SUBCONTRACTORS, insofar as they are applicable.

7.2. The CONTRACTOR shall employ those SUBCONTRACTORS proposed in the Schedule of SUBCONTRACTORS for portions of THE WORK designated and as accepted by the OWNER prior to Acceptance of the TENDER.

7.3. Nothing contained in the CONTRACT DOCUMENTS shall create any contractual obligation between any SUBCONTRACTOR and the OWNER.

8. OTHER CONTRACTORS

8.1. The OWNER reserves the right to let other contracts on the WORKSITE related to the Project and to do work with his own forces on the Project.

8.2. The OWNER shall coordinate the work, insurance coverage's, and compliance of OTHER CONTRACTORS with rules and procedures for the WORKSITE insofar as these affect THE WORK of this CONTRACT.

8.3. The CONTRACTOR shall coordinate his work with that of OTHER CONTRACTORS and tie into works constructed by others as specified or shown in the CONTRACT DOCUMENTS.

8.4. The CONTRACTOR shall report to the OWNER or the ENGINEER any apparent deficiencies in OTHER CONTRACTORS' work which would affect THE WORK of this CONTRACT as soon as they come to his attention and shall confirm such report in writing. Failure by the CONTRACTOR to so report shall invalidate any claims against the OWNER by reason of the deficiencies of OTHER CONTRACTORS' work except as to those of which the CONTRACTOR could not reasonably be aware.

9. ASSIGNMENT

9.1. Neither Party to the CONTRACT shall assign the CONTRACT or any portion thereof, nor any monies due to either Party, without the written consent of the other; which consent shall not be unreasonably withheld.

10. INDEMNITY

10.1. The CONTRACTOR shall indemnify and hold harmless the OWNER, the ENGINEER, OTHER CONTRACTORS and any and all representatives or employees of the OWNER, from and against all third party actions, claims, demands or suits, or payments, losses, judgment or expenses arising out of or in consequence of the acts, omissions or negligence of the CONTRACTOR in performing THE WORK during the period of performance of THE WORK and during the Warranty Period.

10.2. In the event of such a third party action, claim, demand or suit, the OWNER shall give written notice thereof to the CONTRACTOR and the CONTRACTOR shall thereupon defend against or otherwise dispose of the same, and shall pay any losses, judgments and expenses promptly after they are determined.

10.3. If the CONTRACTOR fails, refuses or neglects to defend, or otherwise dispose of such third party action, claim, demand or suit, within reasonable time and within legal time constraints, the OWNER may dispose of such action, claim, demand or suit on such terms as the OWNER, in his sole discretion, shall deem reasonable. The CONTRACTOR shall thereupon, and forthwith, pay to the OWNER the sums paid out by the OWNER and all reasonable costs incurred by the OWNER in disposing of the matter, including the OWNER'S legal costs on the Solicitor and Client basis.

10.4. The obligation of the CONTRACTOR to indemnify the OWNER shall not apply to liability arising out of acts, omissions or negligence of the OWNER, the ENGINEER, OTHER CONTRACTORS or any other representative or employee of the OWNER.

11. DISPUTE RESOLUTION

11.1. The Engineer shall, in the first instance, interpret the CONTRACT and make any determinations for which he is responsible and which he is authorized to make under the CONTRACT. Should either the CONTRACTOR or the OWNER dispute the written interpretation or determination made by the ENGINEER in the first instance, that party shall, within six (6) calendar days of receiving the determination or interpretation, submit to the ENGINEER a written notice of his dispute setting out all of the relevant details.

11.2. Upon receipt of a Notice of Dispute, the ENGINEER shall immediately notify in writing the other party to the CONTRACT and provide to the other party a copy of the Notice of Dispute.

11.3. The OWNER and the CONTRACTOR shall, within six (6) calendar days of receiving such notification, review the dispute jointly and attempt a resolution by negotiation.

11.4. If the OWNER and the CONTRACTOR are not able to resolve the dispute by negotiation, they may, by mutual agreement, engage a mediator to assist them in further negotiation towards reaching a resolution.

11.5. Alternatively, or after mediation has failed, the OWNER and the CONTRACTOR may, by mutual agreement, submit the dispute to arbitration under the laws of the jurisdiction in which THE WORK is situated. Insofar as it is compatible with the law in the jurisdiction in which THE WORK is situated, the Recommended Procedures for Arbitration of Construction Disputes of the Canadian Construction Association, the most current edition, shall be followed. The arbitrator's decision shall be binding.

11.6. Alternatively, the CONTRACTOR or the OWNER may commence an action at law with respect to the dispute if it cannot be resolved by negotiation either with or without mediation. Neither negotiation with or without mediation, nor arbitration, shall be conditions precedent to proceeding with an action at law.

11.7. If the dispute is not resolved promptly, the ENGINEER shall give instructions in writing to the CONTRACTOR to do such work or to take such actions or refrain from taking such actions as may be required to avoid delay, mitigate damage and continue the proper performance of THE WORK pending resolution of the dispute. The CONTRACTOR shall act promptly in accordance with such instructions and by so doing shall not jeopardize any claim he may have with respect to the dispute.

12. DELAYS

12.1. If the CONTRACTOR is delayed in the performance of THE WORK by weather, labour disputes, strikes or lock outs of the CONTRACTOR'S forces, or delay by common carriers, the CONTRACTOR shall not be compensated for any additional costs thereby incurred, nor shall the completion dates be changed, because it is agreed that the CONTRACTOR is more competent than the OWNER to assess the probability and impact of these events. The CONTRACTOR'S forces in this context includes SUBCONTRACTORS and Suppliers and Manufacturers supplying or providing PRODUCTS or MATERIALS.

12.2. If the CONTRACTOR is delayed in the performance of THE WORK by failure of the OWNER to make decisions respecting THE WORK, late delivery of MATERIALS or PRODUCTS furnished by the OWNER, or acts or omissions of the OWNER, or by strikes or lock outs of the OWNER'S forces, the CONTRACTOR shall be compensated for any additional costs thereby incurred, and the completion date, subject to paragraph 11.5 shall be changed. The amount of the compensation and the extent of change in completion date shall be determined in the first instance by the ENGINEER.

12.3. If the CONTRACTOR is delayed in performance of THE WORK by a Suspension of THE WORK Notice by the OWNER and if the period of suspension is thirty (30) calendar days or less, the CONTRACT time shall be extended by the period of suspension plus six (6) calendar days, subject to the condition of paragraph 11.5.

12.4. If the CONTRACTOR is delayed in the performance of THE WORK by a Stop Work Order issued by a court or other public authority, and provided that such Order was not issued as a result of any act or fault of the CONTRACTOR, or of anyone employed by him directly or indirectly, then the CONTRACTOR shall be entitled to claim compensation for additional costs thereby incurred, and the completion date, subject to paragraph 11.5, shall be changed. The amount of compensation and the extent of change in completion date shall be determined in the first instance by the ENGINEER.

12.5. If the Completion Date is changed in accordance with paragraphs 11.2, 11.3 or 11.4, then, with respect to the new Completion Date, time is of the essence.

12.6. The CONTRACTOR shall provide to the OWNER timely written notice of all delays for which it is the CONTRACTOR'S intention to claim either an extension of completion time or costs resulting from the delay or both.

12.7. Impact Delays are those delays which arise out of the OWNER'S requirement of the CONTRACTOR to perform CHANGES IN THE WORK.

Impact delays may be a) certain to occur, b) foreseeable, but not certain to occur, or c) not foreseeable. At the time of submitting a QUOTATION FOR CONTEMPLATED CHANGE, the CONTRACTOR shall identify his intention, if any, to claim for Impact Delays, and provide justification for such claims or intentions to claim so that these can be negotiated and agreed upon in the CHANGE ORDER.

No claim for Impact Delays shall be valid or enforceable except as provided for in a CHANGE ORDER.

13. OWNER'S RIGHT TO DO WORK

13.1. If the CONTRACTOR should refuse or fail to supply adequate PRODUCT, MATERIAL, PLANT or workmanship for the scheduled performance of THE WORK, or neglect to prosecute THE WORK properly, or fail to perform any of the provisions of the CONTRACT, then the OWNER may give written notice to the CONTRACTOR and his Surety that the CONTRACTOR is in default of his contractual obligations, and instruct him to correct the default within five (5) working days.

13.2. If the correction of the default cannot be completed within the five (5) working days specified, the CONTRACTOR shall be considered to be in compliance with the OWNER'S instruction if he:

13.2.1. Commences the correction of the default within the specified time; and

13.2.2. Provides the OWNER with an acceptable schedule for such correction; and

13.2.3. Completes the correction in accordance with such schedule.

13.3. If the CONTRACTOR fails to comply with the provisions of General Conditions 12.1 and 12.2, the OWNER may, without prejudice to any other right or remedy he may have, correct such default and may deduct the cost thereof from the payment then or thereafter due the CONTRACTOR. The ENGINEER shall, in the first instance, determine that both the corrective action and the amount subsequently charged to the CONTRACTOR are reasonable.

14. OWNER'S RIGHT TO TERMINATE THE CONTRACT

14.1. If the CONTRACTOR should:

14.1.1. Be adjudged bankrupt, or make a general assignment for the benefit of creditors, or if a receiver is appointed on account of his insolvency; or

14.1.2. Fail to make sufficient payments due to his creditors for labour, PLANT, PRODUCT and MATERIAL used or reasonably required for use on or in THE WORK; or

14.1.3. Disregard laws or ordinances, or the ENGINEER'S instructions; or

14.1.4. Abandon THE WORK, or fail to adhere to THE WORK Schedule to such an extent that there is danger of failing to meet Completion dates; or

14.1.5. Otherwise violate the fundamental conditions of the Contract;

the OWNER shall, by written notice, instruct the CONTRACTOR to correct the default within five (5) working days. If the default is not corrected within five (5) working days, then the OWNER may, without prejudice to any other right or remedy he may have, terminate the CONTRACTOR'S right to continue THE WORK or terminate the CONTRACT.

14.2. If the OWNER terminates the CONTRACTOR'S right to continue with THE WORK or terminates the CONTRACT under the conditions set out above, and if the performance Warranty is unconditional, the OWNER shall be entitled to:

14.2.1. Take possession of the premises, PRODUCT, MATERIAL and PLANT and utilize them to finish THE WORK by whatever method he may deem expedient but without undue delay or expense; and

14.2.2. Withhold any further payments to the CONTRACTOR until THE WORK is finished; and

14.2.3. Upon completion of THE WORK, determine the full cost of finishing THE WORK as certified by the ENGINEER, including compensation to the ENGINEER for his additional services and a reasonable allowance as determined by the ENGINEER to cover the cost of any corrections required under the WARRANTY PERIOD, and charge the CONTRACTOR the amount by which the full cost exceeds the unpaid balance of the CONTRACT PRICE; or if such cost of finishing THE WORK is less than the unpaid balance of the CONTRACT PRICE, pay the CONTRACTOR the difference; and

14.2.4. On expiry of the WARRANTY PERIOD, charge the CONTRACTOR the cost of corrections required under the warranty.

The CONTRACTOR'S obligation under the CONTRACT as to the quality of that portion of THE WORK and warranty of that portion of THE WORK performed by the CONTRACTOR prior to termination of the CONTRACTOR'S right to continue with THE WORK shall continue in force after the termination.

14.3. If the CONTRACTOR has provided a Performance Bond, the OWNER shall have the option of:

14.3.1. Terminating the CONTRACTOR'S right to continue with THE WORK; or

14.3.2. Terminating the CONTRACT; or

14.3.3. Exercising the OWNER'S rights in accordance with conditions of the Performance Bond.

15. SUSPENSION OF THE WORK BY THE OWNER

15.1. The OWNER may suspend the execution of THE WORK by giving written notice to the CONTRACTOR to that effect.

15.2. The CONTRACTOR, upon receiving such written notice, shall immediately suspend all operations except those necessary for the care and preservation of the portions of THE WORK already executed, and the WORKSITE.

15.3. During the period of suspension, the CONTRACTOR shall not remove from the WORKSITE any part of THE WORK or any MATERIAL, PRODUCT or PLANT without the written approval of the OWNER.

15.4. If the period of suspension is thirty (30) calendar days or less, the CONTRACTOR shall, upon expiry of the suspension, resume the execution of THE WORK and he shall be paid additionally all of his reasonable costs incurred because of the suspension. The additional costs shall be claimed by the CONTRACTOR and shall be verified by a determination of the ENGINEER in the first instance.

15.5. After thirty (30) calendar days, of suspension of THE WORK the OWNER at its sole option shall:

15.5.1. Negotiate terms under which the CONTRACTOR shall continue with the execution of THE WORK and the CONTRACTOR shall then resume operations in accordance with the terms of that negotiation; or

15.5.2. Deem the Notice of Suspension to be a Notice of Termination of the CONTRACT. In the event of Termination, the CONTRACTOR shall be paid his reasonable costs incurred due to the suspension. The additional costs shall be claimed by the CONTRACTOR and verified in the first instance by a determination of the ENGINEER. The CONTRACTOR shall not have a claim for loss of profit on that portion of THE WORK not performed.

15.6. After thirty (30) calendar days of suspension of THE WORK, the CONTRACTOR shall be allowed to remove any or all of its PLANT from the WORKSITE without further approval from the OWNER.

16. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

16.1. If the OWNER should be adjudged bankrupt, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of his insolvency, the CONTRACTOR may, without prejudice to any other right or remedy he may have, by giving the OWNER five (5) days written notice, terminate the CONTRACT.

16.2. If THE WORK should be stopped or otherwise delayed for a period of thirty days or more under an order of any court, or other public authority, and provided that such order was not issued as the result of any act or fault of the CONTRACTOR or of anyone directly or indirectly employed by him, the CONTRACTOR may, without prejudice to any other right or remedy he may have, by giving the OWNER written notice, terminate the CONTRACT.

16.3. The CONTRACTOR may notify the OWNER in writing, with a copy to the ENGINEER, that the OWNER is in default of his contractual obligations if:

16.3.1. The ENGINEER fails to certify a Progress Payment Certificate in accordance with these General Conditions; or,

16.3.2. The OWNER, subject to requirements of these General Conditions, fails to pay to the CONTRACTOR when due, any amount certified by the ENGINEER, or awarded by arbitrators; or,

16.3.3. The OWNER fails to furnish, upon written request from the CONTRACTOR, reasonable evidence of ability to fulfill the OWNER's financial obligation under the CONTRACT.

Such written notice shall advise the OWNER that if such default is not corrected within fifteen (15) calendar days from the receipt of the written notice the CONTRACTOR may, without prejudice to any other right or remedy he may have, stop THE WORK and terminate the Contract.

16.4. If the CONTRACTOR terminates the Contract under the conditions set out above, he shall be paid for all work performed and for any loss sustained upon MATERIAL, PRODUCT and PLANT, with reasonable profit.

17. CHANGES IN THE WORK

17.1. The OWNER may order changes in the work through additions, deletions, modifications or variations without invalidating the CONTRACT. The value of such changes shall be taken into account in ascertaining the final amount of the CONTRACT PRICE. All such work shall be executed under the conditions of the CONTRACT. No extension of the CONTRACT Completion Time shall be made on account of changes in the work unless expressly provided for in the CHANGE ORDER.

17.2. No changes in the work shall be made unless pursuant to a FIELD ORDER or a CHANGE ORDER and no payment shall be made or credit given unless authorized by a CHANGE ORDER.

17.3. The ENGINEER shall have no authority to issue CHANGE ORDERS without prior approval by the OWNER. The OWNER and the CONTRACTOR shall approve and sign every CHANGE ORDER prior to payment.

17.4. The CONTRACTOR may, in writing, propose changes in the work, including the amount of additional payment or credit entailed in the proposal. If the OWNER accepts the CONTRACTOR'S proposal, the OWNER and the CONTRACTOR will authorize a CHANGE ORDER to that effect.

17.5. When the OWNER desires to make a change in the work it shall issue a NOTICE OF CONTEMPLATED CHANGE (NCC) to the CONTRACTOR and the CONTRACTOR shall return to the OWNER a QUOTATION FOR CONTEMPLATED CHANGE (QCC). If the QUOTATION FOR CONTEMPLATED CHANGE is accepted the change in the work shall be authorized by a CHANGE ORDER signed by the OWNER and the CONTRACTOR.

17.6. If the CONTRACTOR claims that any instruction by drawings, or otherwise, involves a change in THE WORK under this CONTRACT, he shall give the OWNER written notice thereof immediately, and he shall then follow the OWNER'S instruction regarding doing the work in question. No suchclaim shall be valid unless so made. If the CONTRACTOR'S claim for a change in THE WORK is approved a CHANGE ORDER shall be issued. The ENGINEER shall, in the first instance, determine the validity of the CONTRACTOR'S claim.

17.7. Impact costs are those costs and delays which arise from the OWNER'S requirement of the CONTRACTOR to perform CHANGES IN THE WORK, and which impact on performance of other parts of the WORK as originally specified.

17.7.1. At the time that the CONTRACTOR submits a QUOTATION FOR CONTEMPLATED CHANGE, there may be expected Impact costs which are certain to occur if the CHANGES IN THE WORK are performed. Such costs shall be stated separately in the CONTRACTOR'S QUOTATION FOR CONTEMPLATED CHANGE with justification of their validity and quantum, so that the OWNER can accept, reject or negotiate their inclusion in a CHANGE ORDER. The CONTRACTOR shall provide a breakdown of all plant, labour, equipment, and overhead costs for QUOTATION FOR CONTEMPLATED CHANGE if requested by the OWNER. This shall also apply to breakdowns and mark-up for SUBCONTRACTOR pricing.

17.7.2. There may be expected some impact costs which have some probability of occurring, but not a certainty. In the QUOTATION FOR CONTEMPLATED CHANGE, the CONTRACTOR shall describe such impacts, with justification for the expectation that they may occur, an estimate (if possible) of the probability of occurrence and an estimate of quantum of costs of the impacts.

17.7.3. There may actually occur some impacts which could not have been foreseen at the time of submission of the QUOTATION FOR CONTEMPLATED CHANGE, and the CONTRACTOR shall make reference to that possibility in the QUOTATION FOR CONTEMPLATED CHANGE.

17.7.4. There may actually occur some impacts which could not have been foreseen at the time of submission of the QUOTATION FOR CONTEMPLATED CHANGE, and the CONTRACTOR shall make reference to that possibility in the QUOTATION FOR CONTEMPLATED CHANGE.

17.7.5. No claim by the CONTRACTOR for additional payment arising from a CHANGE IN THE WORK shall be valid and enforceable against the OWNER unless it is made pursuant to the Provisions of General Condition 16."

18. VALUATION OF CHANGES IN THE WORK

18.1. The valuation of changes in THE WORK due to differences between actual measured quantities at the time of construction and the approximate estimated quantities shown in the TENDER shall be determined on the basis of the Unit Prices named in the TENDER. No CHANGE ORDER is required.

18.2. The valuation of changes in THE WORK due to deletion of work within the scope of the CONTRACT or addition of work to the scope of the CONTRACT shall be determined by Unit Prices named in the TENDER. A CHANGE ORDER is required.

18.3. When there are changes in THE WORK which are not covered by Unit Prices named in the TENDER, the valuation of such changes shall be determined by:

18.3.1. An agreement on a Lump Sum in each instance between the OWNER and the CONTRACTOR; or

18.3.2. At the rates for the provision of labour and PLANT named in the Schedule of Force Account Rates in the Supplementary TENDER Forms, plus the CONTRACTOR'S cost plus 10% for MATERIAL and PRODUCT F.O.B. the job site, as established by invoices. Superintendent and Foremen are included in the 10% mark-up; or

18.3.3. On a CONTRACTOR'S cost basis as follows:

18.3.3.1. Payroll Cost of Labour, defined as direct wages and salaries for the hours worked, plus 10% to cover Workers' Compensation, Unemployment Insurance, Holiday Pay, Paid Statutory Holidays and other valid payroll burdens; plus

18.3.3.2. The CONTRACTOR'S cost of providing room and board for labour, if room and board is normally provided by the CONTRACTOR on THE WORK; plus

18.3.3.3. The CONTRACTOR'S cost for MATERIAL and PRODUCT F.O.B. the job site, less trade discounts, as established by invoices; plus

18.3.3.4. Ten percent (10%) fee on the sum of items 18.3.3.1, 18.3.3.2 and 18.3.3.3 to cover office and general overhead, use of small tools and profit. Overhead includes the cost of superintendence, foremen, timekeepers and other administrative and supervisory personnel and their vehicles and other job site costs, plus all office overhead costs; plus

18.3.3.5. The cost of rental of PLANT for the hours worked, at locally accepted rates, or at provincial or territorial rates, for complete units including operator, fuel, grease, maintenance and all such other costs as are normal to an operating unit on the job site; plus

18.3.3.6. A 10% mark-up on item 18.3.3.5 to the CONTRACTOR (but not to a Subcontractor) provided that the CONTRACTOR does not own the equipment; plus

18.3.3.7. Valid transportation costs for PLANT, specifically required for the change in the work, with no mark-up.

The choice of valuation methods 18.3.1, 18.3.2 or 18.3.3.shall be made by the OWNER in his sole discretion.

18.4. When the change in THE WORK is being done on a cost basis, that is, options 18.3.2 or 18.3.3, the CONTRACTOR shall be paid for work performed by his Subcontractors on the basis of a valuation in accordance with 18.3.2 or 18.3.3, depending upon which was selected by the OWNER for the change in THE WORK. The CONTRACTOR shall be allowed a mark-up of 5% on the SUBCONTRACTOR'S charges to cover the CONTRACTOR'S coordination.

18.5. When a change in THE WORK is being done on a cost basis, either option 18.3.2 or 18.3.3, the CONTRACTOR shall submit to the ENGINEER or the OWNER on a daily basis an accounting in triplicate for work done on the preceding calendar day. The accounting shall include a listing of the hours of labour and PLANT and a listing of the MATERIAL and PRODUCT used. The ENGINEER shall, each day, check the CONTRACTOR'S accounting and, if it is numerically correct, he shall sign the three copies and return one signed copy to the CONTRACTOR. Only those items which are eligible in accordance with the CONTRACT shall be certified for payment by a CHANGE ORDER. The ENGINEER's signature shall not constitute an approval for payment.

18.6. If, on any day, the CONTRACTOR fails to submit an account of the change in THE WORK being done on a cost basis, either option 18.3.2 or 18.3.3, the ENGINEER shall prepare the accounting, and this accounting shall be used as the basis of payment for that portion of the change in THE WORK, and no payment will be made for any other amount subsequently claimed by the CONTRACTOR for that portion of the change in THE WORK.

18.7. The CONTRACTOR in seeking recovery of Impact Cost as defined in General Condition 16 (Supplementary General Condition Document 00816), shall submit weekly accounts to the ENGINEER, justifying its claims in accordance with the requirements of the CHANGE ORDER.

19. PAYMENTS

19.1. At the end of each month during the performance of THE WORK, the CONTRACTOR shall prepare a Progress Payment Claim for that portion of THE WORK done during that month.

19.2. A holdback of 10% of the total value of that portion of THE WORK performed to the end of that month, as shown on the Progress Payment Claim, shall be retained for various purposes of the OWNER, including conformance with the lien enactment, along with any other deductions from the Progress Payment Claim which may be warranted or may be required in accordance with conditions of this CONTRACT.

19.3. The Progress Payment Claim shall be certified by the ENGINEER on the PROGRESS PAYMENT CERTIFICATE. Provided that the CONTRACTOR has submitted his Progress Payment Claim by the end of the month, the PROGRESS PAYMENT CERTIFICATE shall be submitted to the OWNER within seven (7) calendar days after the end of the month during which that portion of THE WORK covered by the PROGRESS PAYMENT CERTIFICATE was performed.

19.4. Within 30 calendar days after receipt of the PROGRESS PAYMENT CERTIFICATE the OWNER shall make payment to the CONTRACTOR in the amount certified on the PROGRESS PAYMENT CERTIFICATE, provided there are no valid reasons for withholding payment.

19.5. The OWNER may withhold payment on any PROGRESS PAYMENT CERTIFICATE as may be necessary or prudent to protect himself from loss on account of:

19.5.1. Unsatisfactory progress by the CONTRACTOR;

19.5.2. Defective work which is not remedied;

19.5.3. Claims filed, or reasonable expectation that claims will be filed, against the OWNER or the CONTRACTOR;

19.5.4. The failure of the CONTRACTOR to make payments properly to SUBCONTRACTORS or for MATERIAL, PRODUCT, PLANT and labour, or otherwise;

19.5.5. Damages caused by the CONTRACTOR to an OTHER CONTRACTOR;

19.5.6. Any other evidence of loss or danger of loss by the OWNER, on account of the CONTRACTOR'S operations.

19.6. The OWNER may withhold payment on any PROGRESS PAYMENT CERTIFICATE if upon request by the ENGINEER the CONTRACTOR does not submit an updated project schedule.

19.7. The CONTRACTOR may claim the Holdback, either in total, or in increments, in accordance with applicable Lien Act.

The OWNER shall pay the CONTRACTOR'S claim for Holdback release after the following conditions have been satisfied:

19.7.1. The CONTRACTOR, or the OWNER, or the ENGINEER on behalf of the OWNER, has issued a Certificate of Completion, or a Certificate of Substantial Completion, in accordance with requirements of the Lien Act.

19.7.2. The CONTRACTOR has submitted to the OWNER, a Certification from the Worker's Compensation Board stating that all assessments due to them from the CONTRACTOR are currently paid up.

19.7.3. The CONTRACTOR has filed with the OWNER, a Statutory Declaration that, with the exception of Holdbacks retained by the OWNER, all payments have been made to eligible Lien claimants and that there are no liens existing against the premises of THE WORK.

The Statutory Declaration shall be dated 5 days after the latest date for filing Liens in accordance with the applicable Lien Act.

20. FINAL PAYMENT

20.1. Upon receipt of Written Notice from the CONTRACTOR that THE WORK is complete, that all deficiencies have been rectified, and all cleanup finished, the ENGINEER shall make an inspection, and when he finds THE WORK complete under the CONTRACT, he shall issue the CONSTRUCTION COMPLETION CERTIFICATE over his signature and the date specified in this Certificate shall be the date of commencement of the WARRANTY PERIOD.

20.2. If, upon inspection, the ENGINEER determines that THE WORK is not completed, he shall instruct the CONTRACTOR, and issue a list of work items to be done, of cleanup items remaining, and of deficiencies to be rectified and when these have been done, he shall issue to the CONTRACTOR, the CONSTRUCTION COMPLETION CERTIFICATE, and the date specified in this Certificate, shall be the date of commencement of the WARRANTY PERIOD. The issuance of the CONSTRUCTION COMPLETION CERTIFICATE does not release the CONTRACTOR from his responsibilities under the CONTRACT.

20.3. FINAL PAYMENT shall be made on the CONTRACTOR'S Final Progress Payment Claim after the date of the CONSTRUCTION COMPLETION CERTIFICATE and after the following conditions have been satisfied:

20.3.1. The CONTRACTOR has submitted to the OWNER a certificate by the Worker's Compensation Board that all assessments due to them from the CONTRACTOR have been paid.

20.3.2. The CONTRACTOR has submitted to the OWNER a Statutory Declaration stating that all claims for payment for MATERIAL, PRODUCT, PLANT, and labour incurred by the CONTRACTOR directly or indirectly on account of THE WORK have been paid no liens exist against the premises in respect of anything done or furnished under this CONTRACT, all claims and demands for payment in connection with this CONTRACT have been submitted and approved, thus establishing the final CONTRACT PRICE and the amount of the FINAL PAYMENT.

The Statutory Declaration shall be dated 5 days after expiry of the limitation period for filing liens in the jurisdiction where THE WORK has been performed.

20.4. Notwithstanding the Articles above, 2 1/2% of the Final Contract Price shall be retained as Security for Maintenance.

21. FINAL CERTIFICATE

21.1. Upon the expiration of the WARRANTY PERIOD, the successful conclusion of any tests required by the CONTRACT and satisfactory performance under operating conditions meeting THE WORK performance Warranty, the OWNER shall accept THE WORK and a FINAL CERTIFICATE may be issued if required by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR to apply in writing to the ENGINEER for a FINAL CERTIFICATE.

21.2. The issuance of a FINAL CERTIFICATE shall not release the CONTRACTOR from responsibility for any defects in his work, PRODUCT or MATERIAL for which the CONTRACTOR may in future be found liable in a court of law or otherwise.

22. TAXES AND DUTIES

22.1. The CONTRACTOR shall pay all government sales taxes, customs duties and excise taxes and comply with laws, Acts, and regulations for collection and remittance of taxes with respect to the CONTRACT.

22.2. Where an exemption of government sales taxes, customs duties or excise taxes is applicable to the CONTRACT by way of the CONTRACTOR filing claims for, or cooperating fully with the OWNER and the proper authorities in seeking to obtain such refunds, the procedure shall be established in a Supplementary General Condition.

22.3. The Federal Goods and Services Tax (GST) or the Harmonized Sales Tax (HST) is included in the TENDER PRICE and in the CONTRACT PRICE.

22.4. The CONTRACTOR shall show separately on each Progress Payment Claim the amount of GST or HST required by the Act for the total amount of the Progress Payment Claim before Holdback deduction. GST or HST on the net amount of payment after Holdback deduction will be paid to the CONTRACTOR by the OWNER in addition to the Net payment of each Progress Payment Claim.

22.5. GST or HST applicable to the Holdback will be paid to the CONTRACTOR upon release of the Holdback. The CONTRACTOR shall remit the GST or HST in accordance with the Act.

23. PATENT FEES

23.1. The CONTRACTOR shall pay all royalties and patent license fees required for the performance of the CONTRACT. He shall hold the OWNER harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the CONTRACTOR'S performance of the CONTRACT which are attributable to an infringement or an alleged infringement of any patent of invention, by the CONTRACTOR, or anyone for whose acts it may be liable.

23.2. In the event that the CONTRACTOR claims that, during the performance of THE WORK, he has encountered a claim for a patent license fee, for use of a MATERIAL, PRODUCT, process or method which was specified by the ENGINEER, and that he was not previously aware that use of such MATERIAL, PRODUCT, process or method was restricted under patent, or that a patent license fee was required, he shall immediately notify the OWNER, in writing, setting out the details of such claim and evidence of his previous lack of awareness of such license fee being required. The ENGINEER shall immediately investigate the claim and if it is judged valid, and the MATERIAL, PRODUCT, process or method is used, the OWNER shall pay the patent license fee.

24. LAWS, REGULATIONS, SURVEYS AND PERMITS

24.1. The Laws and Regulations of the place where THE WORK is performed shall govern.

24.2. The OWNER shall provide all legal surveys except legal surveys required to replace survey pins destroyed or damaged by the CONTRACTOR.

24.3. The CONTRACTOR shall obtain all Permits, Licenses and Certificates, and pay all fees required for the performance of THE WORK.

24.4. The OWNER shall obtain all easements and rights of way, and the CONTRACTOR shall have free use thereof for the purposes of this CONTRACT, provided that such use shall not interfere with or impede the operation of any OTHER CONTRACTORS or workmen employed by the OWNER, nor be in conflict with conditions of easement agreement or right of way limits. The CONTRACTOR shall indemnify and defend the OWNER against any claims, demands, or losses due to failure to meet all conditions of an easement agreement.

24.5. The CONTRACTOR shall give all required notices, and comply with all laws, ordinances, regulations, codes and orders of all authorities having jurisdiction relating to THE WORK, to preservation of public health, and to construction safety. If the CONTRACTOR observes anything in the CONTRACT DOCUMENTS to be at variance with the foregoing, he shall promptly notify the ENGINEER in writing, and shall await the ENGINEER'S instructions. If the CONTRACTOR performs any work, knowing it to be contrary to such laws, ordinances, regulations, codes or orders, and without giving notice to and requesting instructions from the ENGINEER, he shall bear all costs arising therefrom.

24.6. The CONTRACTOR shall make all arrangements with local authorities, operating departments, railway and highway officials, utility and service companies and the like, for detours, crossings, traffic control and similar requirements relating to performance of THE WORK, and he shall at his own cost observe their requirements and regulations.

25. COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY ENACTMENTS

25.1. The CONTRACTOR shall be primarily responsible for ensuring compliance with the applicable Occupational Health and Safety enactment and Regulations thereunder on the WORKSITE.

25.2. In any case where, pursuant to the provisions of the applicable Occupational Health and Safety Act or its Regulations, an order is given to the CONTRACTOR or to one of his SUBCONTRACTORS with respect to their operations under this CONTRACT to cease operations for any reason (for examples, because of failure to install or adopt safety devices or appliances or methods as directed or required by the Act or Regulations thereunder, or because conditions of immediate danger exist that would be likely to result in injury to any person), the CONTRACTOR shall immediately obey such order and shall immediately take whatever steps are necessary to eliminate the cause of the order.

25.3. In the event that the ENGINEER discovers a dangerous condition which in the ENGINEER's opinion is likely to result in injury to any person, and there is no one in authority from the CONTRACTOR available or capable of removing the danger resultant from the CONTRACTOR'S operations, and no Officer of the Crown is available to take charge, then the ENGINEER may:

25.3.1. issue a Field Order to the CONTRACTOR's workers to vacate the area of danger;

25.3.2. issue a Field Order to the CONTRACTOR requiring the immediate correction of the dangerous condition; and

25.3.3. notify the appropriate Officer(s) under the applicable Occupational Health and Safety Act,

and no such action by the ENGINEER shall in any way remove the responsibility for the matter from the CONTRACTOR, and the CONTRACTOR shall bear all related costs without recourse.

25.4. In the event that the ENGINEER discovers a dangerous condition which in the ENGINEER's opinion is likely to result in damage to any property, and there is no one in authority from the CONTRACTOR available or capable of removing the danger resultant from the CONTRACTOR'S operations, and no Officer of the Crown is available to take charge, then the ENGINEER may issue Written Notice to the CONTRACTOR and may immediately arrange for the removal of this danger and the CONTRACTOR shall be liable for the costs of such arrangements, but such act by the ENGINEER shall not relieve the CONTRACTOR of responsibility for injury, loss of life, or damage which may occur in that situation. The ENGINEER may also invoke Section 27.5 of this Specification.

25.5. In the event that the CONTRACTOR refuses or fails to comply with an order under the Act or Regulations thereunder, so that the performance of THE WORK is stopped, the OWNER may, upon written notice, terminate the CONTRACT and proceed in accordance with General Conditions 13.2.

25.6. No action or lack of action by the ENGINEER or the OWNER under any of the provisions of this Section shall relieve the CONTRACTOR of his responsibilities under 24.1 above.

26. LIABILITY INSURANCE

26.1. Comprehensive General Liability Insurance

26.1.1. The CONTRACTOR shall provide and maintain, either by way of a separate policy or by an endorsement to its existing policy, Comprehensive General Liability Insurance in a form and with an insurer acceptable to the OWNER and subject to limits of not less than five million dollars ($5,000,000) inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof.

26.1.2. The insurance shall be in the joint names of the CONTRACTOR, the OWNER and the ENGINEER, and shall also cover as Unnamed Insureds all SUBCONTRACTORS and anyone employed directly or indirectly by the CONTRACTOR or his SUBCONTRACTORS to perform a part or parts of THE WORK and including suppliers while on the WORKSITE to deliver MATERIAL or PRODUCT.

26.1.3. The insurance shall also include as Unnamed Insureds the consultants of the OWNER and of the ENGINEER, on THE WORK.

26.1.4. The Comprehensive General Liability Insurance shall include coverage for:

26.1.4.1. premises and operations liability

26.1.4.2. products or completed operations liability

26.1.4.3. blanket contractual liability

26.1.4.4. cross liability

26.1.4.5. elevator and hoist liability, as applicable

26.1.4.6. contingent employer's liability

26.1.4.7. personal injury liability arising of false arrest, detention or imprisonment or malicious prosecution, libel, slander or defamation of character; invasion of privacy, wrongful eviction or wrongful entry.

26.1.4.8. shoring, blasting, excavating, underpinning, demolition, pile driving and caisson work, work below ground surface, tunnelling and grading, as applicable.

26.1.4.9. liability with respect to non-owned licensed vehicles.

26.1.4.10. liability with respect to working in an active airside environment at an airport.

26.1.5. Comprehensive General Liability Insurance shall remain in effect continuously until the Construction Completion Certificate has been issued and then a Completed Operation Extension for 24 months shall be provided by the CONTRACTOR.

26.2. Automobile Liability Insurance

26.2.1. The CONTRACTOR shall provide and maintain liability insurance in respect of owned, non owned and leased or rented licensed vehicles, aircraft or water craft, subject to limits of not less than three million dollars ($3,000,000) inclusive.

26.2.2. Automobile liability insurance shall be maintained continuously until the end of the WARRANTY PERIOD.

26.3. The CONTRACTOR shall provide the OWNER with three certified copies of the Certificate of Insurance prior to the commencement of THE WORK and shall promptly provide the OWNER with a certified true copy of each insurance policy if requested.

26.4. All liability insurance policies shall contain an endorsement to provide all Named Insureds with prior notice of material changes and cancellations. Such endorsement shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended materially nor cancelled until 30 days after written notice of such change or cancellation shall have been given to all Named Insureds."

27. PROPERTY INSURANCE (COURSE OF CONSTRUCTION INSURANCE)

27.1. The CONTRACTOR shall provide and maintain property (course of construction) insurance in a form and by an insurer acceptable to the OWNER, insuring the full value of THE WORK in the amount of the CONTRACT PRICE. The policies shall include as named insureds the CONTRACTOR, the OWNER, and the ENGINEER. The policies shall also include as unnamed insureds all SUBCONTRACTORS and the OWNER'S and the ENGINEER'S consultants on THE WORK.

27.2. Such coverage shall be provided for by a standard All Risks Builders' Risk Policy, including flood and earthquake and with only the following exclusions:

27.2.1. Any loss of use or occupancy howsoever caused;

27.2.2. Penalties for non completion of or delay in completion of contract or non compliance with contract conditions;

27.2.3. Cost of making good faulty or defective workmanship, material, construction or design, but this exclusion shall not apply to damage resulting from such faulty or defective workmanship, material, construction or design;

27.2.4. Wear and tear, normal upkeep, inherent vice, latent defect, vermin or normal making good, but this exclusion shall not apply to damage resulting from wear and tear, normal upkeep, inherent vice, latent defect, vermin or normal making good;

27.2.5. Loss or damage caused by war, invasion, act of foreign enemy, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection or military power;

27.2.6. Loss or damage caused by contamination by radioactive materials;

27.2.7. Loss or damage caused by frost or freezing caused by natural forces unless resulting from a peril insured hereunder;

27.2.8. Mysterious disappearance of property (except property in the custody of carriers or bailees for hire) or shortage disclosed by taking inventory;

27.2.9. Mechanical breakdown, but this exclusion shall not be deemed to exclude loss or damage arising as a consequence of mechanical breakdown;

27.2.10. Infidelity of the Insured's employees.

27.3. The policies shall insure against all risks of direct loss or damage, and damage or loss due to delayed start up, or due to delay in beneficial use in the amount of $100,000.

27.4. Property Insurance shall cover:

27.4.1. All PRODUCT, MATERIAL, labour and supplies of any nature whatsoever, the property of the Insureds or of others for which the Insureds may have assumed responsibility, to be used in or pertaining to the site preparations, demolition of existing structures, erection and/or fabrication and/or reconstruction and/or repair of THE WORK while on the site or in transit;

27.4.2. The installation, testing and any subsequent use of machinery and equipment including boilers, pressure vessels or vessels under vacuum related to THE WORK;

27.4.3. Damage to THE WORK caused by an accident to and/or the explosion of any boiler(s) or pressure vessel(s) forming part of THE WORK.

27.5. Such coverage shall exclude construction machinery, equipment, temporary structural and other temporary facilities, tools and supplies used in the construction of THE WORK.

27.6. The CONTRACTOR shall provide the OWNER with three certified copies of the Certificate of Insurance to be incorporated into the signed copies of the CONTRACT DOCUMENT prior to commencement of THE WORK and shall promptly provide the OWNER with a certified true copy of each insurance policy if requested.

27.7. Policies provided shall contain an endorsement to provide all Named Insureds with prior notice of changes and cancellations. Such endorsement shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way nor cancelled until 30 days after written notice of such change or cancellation shall have been given to all Named Insureds."

27.8. All such insurance shall be maintained continuously until ten (10) days after the date of the Construction Completion Certificate. All such insurance shall provide for the OWNER to take occupancy of THE WORK or any part thereof during the term of this insurance. Any increase in the cost of this insurance arising out of such occupancy shall be at the OWNER'S expense.

27.9. The policies shall provide that, in the event of a loss, payment for damage to THE WORK shall be made to the OWNER and the CONTRACTOR as their respective interests may appear. The CONTRACTOR shall act on behalf of the OWNER and himself for the purpose of adjusting the amount of such loss with the Insurers. On the determination of the extent of the loss, the CONTRACTOR shall immediately proceed to restore THE WORK and shall be entitled to receive from the OWNER (in addition to any sum due under the CONTRACT) the amount at which the OWNER'S interest in the restoration THE WORK has been appraised, such amount to be paid as the restoration proceeds and in accordance with the ENGINEER'S certificates for payment. Damage shall not affect the rights and obligations of either party under the CONTRACT except that the CONTRACTOR shall be entitled to such reasonable extension of time for Completion of THE WORK as the ENGINEER may determine in the first instance and subject to General Condition 11.5.

27.10. The CONTRACTOR and SUBCONTRACTORS as may be applicable shall be responsible for any deductible amounts under the policies and for providing such additional insurance as may be required to protect them against loss on items excluded from the policies.

28. PROTECTION OF WORK AND PROPERTY

28.1. The CONTRACTOR shall continuously maintain adequate protection of all of THE WORK from damage, and protect the OWNER'S property from damage or loss arising in connection with this CONTRACT. He shall make good any such damage or loss.

28.2. The CONTRACTOR shall provide and maintain all passageways, guard fences, lights and other facilities for protection required by public authority or local conditions, or laws atg5nd regulations.

28.3. The CONTRACTOR shall also protect all of the property outside of THE WORK from damage as a result of his operations. Any such damage shall be corrected by the CONTRACTOR at his expense.

28.4. In an emergency affecting the safety of life, or of THE WORK, or adjoining property, the CONTRACTOR, without special instruction or authorization from the ENGINEER, shall act at his discretion to prevent such threatened loss or injury. Liability for payment for such action and the amount thereof shall be determined in the first instance by the ENGINEER.

28.5. If the ENGINEER becomes aware of an emergency affecting the safety of life, or of THE WORK, or of adjoining property, and the CONTRACTOR, having been advised in writing of the emergency, fails or refuses to act to prevent such threatened loss, injury or damage, or if the ENGINEER is unable to advise the CONTRACTOR, the ENGINEER may order labour, material, and PLANT to be applied to prevent loss, injury or damage. The cost of labour, materials and equipment so used shall be the responsibility of the CONTRACTOR, and such action by the ENGINEER shall not relieve the CONTRACTOR of any responsibility for loss, injury, or damage which does occur.

29. WARRANTY PERIOD

29.1. The WARRANTY PERIOD shall begin on the date specified in the CONSTRUCTION COMPLETION CERTIFICATE.

29.2. The duration of the WARRANTY PERIOD shall be a minimum of one year.

29.3. The CONTRACTOR shall correct, at his own expense, any defects in THE WORK due to faulty products or workmanship appearing within the WARRANTY PERIOD.

29.4. The CONTRACTOR shall correct or pay for any damage to THE WORK or other property resulting from such defects or their correction.

29.5. The OWNER shall notify the CONTRACTOR promptly of such defects. If the CONTRACTOR does not cause repairs to be made within ten (10) days after such notice, the OWNER shall have the right to purchase MATERIAL and employ men to execute said repairs, and the cost of the same shall be the responsibility of the CONTRACTOR or his Surety.

29.6. Where repairs must be made immediately by reason of an emergency existing or otherwise, the OWNER shall have the right to undertake such repairs and charge the cost to the CONTRACTOR, except that the OWNER shall immediately notify the CONTRACTOR and shall withdraw from the work of repair if and as soon as the CONTRACTOR'S forces are ready to start work.

29.7. The CONTRACTOR shall be responsible for all costs attributable to defective work, PRODUCT or MATERIAL, including the cost of engineering required for investigation of any repair of defects in THE WORK.

29.8. At least one month prior to expiry of the WARRANTY PERIOD, the OWNER shall notify the CONTRACTOR in writing of any final tests which the CONTRACTOR may be required to carry outunder the CONTRACT. The CONTRACTOR shall arrange to have such tests carried out promptly, and to provide opportunity for the OWNER to inspect or supervise such tests.

29.9. At least one month prior to expiry of the WARRANTY PERIOD, the OWNER shall advise the CONTRACTOR of defects which the CONTRACTOR is required to remedy under the CONTRACT, and the CONTRACTOR shall promptly remedy such defects. The WARRANTY PERIOD shall not expire until all such defects are remedied.

30. INSPECTION OF THE WORK

30.1. The ENGINEER and his representatives shall at all times have access to THE WORK whenever it is in preparation or progress and the CONTRACTOR shall provide proper facilities for such access and for inspection. The ENGINEER shall have authority to reject work which does not conform to the requirements of the CONTRACT.

30.2. If the specifications, the ENGINEER'S instructions, laws, ordinances, or any public authority require any part of THE WORK to be specially tested or approved, the CONTRACTOR shall give the ENGINEER timely notice of his readiness for inspection, and if the inspection is by an authority other than the ENGINEER, of the date fixed for such inspection.

30.3. Inspections by the ENGINEER shall be made promptly. If any part of THE WORK should be covered up without approval or consent of the ENGINEER, it must, if required by the ENGINEER, be uncovered for examination at the CONTRACTOR'S expense.

30.4. Re examination of questioned parts of THE WORK may be ordered by the ENGINEER and if so ordered those parts of THE WORK shall be uncovered by the CONTRACTOR. If such parts of THE WORK are found not in accordance with the CONTRACT DOCUMENTS through the fault of the CONTRACTOR, the CONTRACTOR shall pay the cost of examination and replacement of THE WORK. If such parts of THE WORK are found in accordance with the CONTRACT DOCUMENTS, the OWNER shall pay these costs.

30.5. MATERIAL and PRODUCT to be used in THE WORK are subject to inspection and approval of the ENGINEER at his discretion. MATERIAL and PRODUCT condemned as being unsuitable and not in conformity with the specifications, shall be removed from THE WORK and its vicinity without delay, and if the CONTRACTOR fails to do so within forty eight (48) hours after having been so directed by the ENGINEER, the rejected MATERIAL and PRODUCT may be destroyed or removed by the OWNER and the cost shall be charged to the CONTRACTOR.

30.6. The ENGINEER shall inspect THE WORK in the OWNER'S interest for the purpose of promoting effective completion of THE WORK until the CONSTRUCTION COMPLETION CERTIFICATE is issued, and such inspection or lack of it shall not relieve the CONTRACTOR of his responsibility to perform THE WORK in accordance with the CONTRACT.

31. REJECTED WORK

31.1. Defective Work which has been rejected by the ENGINEER as failing to conform to the intent of design as expressed in the CONTRACT DOCUMENTS whether the result of poor workmanship, use of defective MATERIAL or PRODUCT, or damage through carelessness or other act or omission of the CONTRACTOR, and whether incorporated in THE WORK or not, shall be removed promptly from the premises by the CONTRACTOR and replaced or re executed promptly at the CONTRACTOR'S expense.

31.2. Work that has not been rejected specifically by the ENGINEER shall not therefore be deemed accepted or approved by the Engineer.

31.3. OTHER CONTRACTORS' work destroyed or damaged by such removals or replacements shall be made good promptly at the CONTRACTOR'S expense.

31.4. If in the opinion of the ENGINEER it is not expedient to correct defective Work or Work not done in accordance with the intent of design as expressed in the CONTRACT DOCUMENTS, the OWNER may deduct from the CONTRACT PRICE the difference in value between THE WORK as done and that called for by the CONTRACT. The difference shall be determined in the first instance by the ENGINEER.

32. LABOUR

32.1. The CONTRACTOR shall employ Canadian Labour to the fullest practical extent and shall ensure that no person will be discriminated against because of race, colour, gender, age, religion, or origin.

32.2. Wages and hours of labour shall be in compliance with Federal, Provincial or Territorial enactment, whichever governs.

32.3. The CONTRACTOR shall at all times enforce discipline and good order among his employees, and shall not employ on THE WORK any unfit person or anyone not skilled to do THE WORK assigned to him. Any person employed on THE WORK who becomes intoxicated, intemperate, disorderly, incompetent or wilfully negligent, shall be removed from THE WORK.

33. MATERIAL AND PRODUCT SUPPLIED BY THE CONTRACTOR

33.1. The CONTRACTOR shall use MATERIAL and PRODUCT of Canadian manufacture to the fullest extent practicable.

33.2. Unless otherwise specified, all MATERIAL and PRODUCT shall be new and of good quality. The CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of MATERIAL and PRODUCT. The CONTRACTOR shall be responsible for replacement at his own cost of all MATERIAL and PRODUCT that are found to be defective in manufacture or that have become damaged in handling.

33.3. The CONTRACTOR shall be responsible for the safe storage of MATERIAL and PRODUCT furnished by or to him, and accepted by him, and intended for THE WORK, until it has been incorporated into THE WORK.

33.4. Where, in the specifications or on the drawings, any MATERIAL, PRODUCT or method is specified, the CONTRACTOR may not use another MATERIAL, PRODUCT, equipment or method unless the ENGINEER has issued to the CONTRACTOR a written authorization for the use. The CONTRACTOR shall submit in writing an application for review to the ENGINEER. All submissions shall be accompanied by sufficient data including the following:

33.4.1. Delivery

33.4.2. Manufacture

33.4.3. Technical Data and Specifications in accordance with the International System of Units (S.I.) metric units

33.4.4. Specified MATERIAL, PRODUCT or method for which the alternative is submitted

33.4.5. Prices in relation to the MATERIAL; method or PRODUCT specified originally.

33.4.6. Where required by the ENGINEER, samples shall be submitted.

33.5. Whenever alternatives of MATERIAL, PRODUCT or methods are accepted for THE WORK, whether as a result of an alternative Proposal by the CONTRACTOR or an equivalent alternative submitted by the CONTRACTOR, the CONTRACTOR shall guarantee that the performance of the alternative MATERIAL, PRODUCT, or method shall be equivalent to what was originally specified.

33.6. Whenever alternatives of MATERIAL, PRODUCT or methods are accepted for use on THE WORK, whether as a result of an alternative proposal by the CONTRACTOR or an equivalent alternative submitted by the CONTRACTOR, the CONTRACTOR shall be responsible for making all consequent adjustments, at his own expense, to make the alternative fit into THE WORK as specified.

34. MATERIAL AND PRODUCT SUPPLIED BY THE OWNER

34.1. The OWNER undertakes to supply only such MATERIAL or PRODUCT as are specifically shown in the CONTRACT DOCUMENTS as being provided by the OWNER

34.2. It shall be the responsibility of the CONTRACTOR to arrange for and schedule delivery and storage of MATERIAL and PRODUCT supplied by the OWNER.

34.3. The CONTRACTOR'S responsibility for MATERIAL and PRODUCT furnished by the OWNER shall begin at the time and place of delivery thereof to the CONTRACTOR. MATERIAL and PRODUCT already on the site shall become the CONTRACTOR'S responsibility on the date specified in the Notice to Proceed. The CONTRACTOR shall be responsible for unloading all OWNER supplied MATERIAL and PRODUCT and the CONTRACTOR and the ENGINEER shall jointly examine them at the time and place of delivery to the CONTRACTOR, and shall prepare a statement of acceptance, specifically noting any defects and rejecting any defective MATERIAL or PRODUCT. The CONTRACTOR shall sign a Statement of Acceptance of MATERIAL and PRODUCT when accepting them into his charge. Any MATERIAL and PRODUCT furnished by the OWNER and installed by the CONTRACTOR shall, if found defective, be replaced by the CONTRACTOR. The CONTRACTOR, shall, at his own expense, furnish supplies, labour and facilities necessary to remove the defective MATERIAL and PRODUCT and install the sound MATERIAL and PRODUCT in a satisfactory manner.

35. STORAGE FACILITIES AND USE OF PREMISES

35.1. The CONTRACTOR may use such facilities and areas as the OWNER may be willing and able to designate for the storage of MATERIAL and PRODUCT for THE WORK, without charge to the CONTRACTOR.

35.2. Should the CONTRACTOR require additional facilities or areas he shall make all the necessary arrangements with the owners or occupants of such other facilities or areas and shall pay all rentals and all damages caused by such occupancy.

35.3. The CONTRACTOR shall confine his apparatus, the storage of MATERIAL and PRODUCT and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the ENGINEER and shall not unreasonably encumber the premises with his MATERIAL, PRODUCT or PLANT.

35.4. The CONTRACTOR shall enforce all regulations and rules for the WORKSITE regarding signs, advertisements, fires, smoking, and storage of inflammable MATERIAL or PRODUCT, and disposal of wastes.

35.5. The CONTRACTOR shall not load or permit any part of THE WORK or of the OWNER'S structures to be loaded in any way that will endanger their safety.

36. USE OF COMPLETED PORTIONS OF THE WORK

36.1. The OWNER shall have the right to take possession of and use any completed or partially completed portions of THE WORK, notwithstanding that the time for completing THE WORK or such portions of THE WORK may not have expired; but such taking possession of and use shall not be deemed an acceptance of THE WORK.

36.2. If such prior use increases the cost of THE WORK, the CONTRACTOR shall be entitled to such compensation as the ENGINEER in the first instance may determine.

36.3. If a planned taking possession of and use of portions of THE WORK has been stipulated in the CONTRACT DOCUMENTS, then the CONTRACTOR shall have no claim for extra compensation on that account.

37. CLEANUP AND FINAL CLEANING OF THE WORK

37.1. The CONTRACTOR shall maintain THE WORK in a tidy condition, free from accumulation of waste products and debris caused by his own operations.

37.2. When THE WORK is fully completed, the CONTRACTOR shall remove all surplus MATERIAL and PRODUCT, tools and PLANT. He shall also remove any waste products and debris, other than those caused by the OWNER, OTHER CONTRACTORS or their employees. He shall generally leave the WORKSITE in a neat and orderly condition.

38. DELAYS/EXTENSIONS

38.1. If the CONTRACTOR is delayed in the performance of THE WORK by weather, labour disputes, strikes or lock outs of the CONTRACTOR'S forces, or delay by common carriers, shortage of MATERIALS or PRODUCTS or intermittent power, the CONTRACTOR shall not be compensated for any additional costs thereby incurred, nor shall the completion dates be changed, because it is agreed that the CONTRACTOR is more competent than the OWNER to assess the probability and impact of these events and to make appropriate contingencies and plan accordingly. The CONTRACTOR'S forces in this context include SUBCONTRACTORS and Suppliers and Manufacturers supplying or providing PRODUCTS or MATERIALS.

38.2. If the CONTRACTOR is delayed in the performance of THE WORK by failure of the OWNER to make decisions respecting THE WORK, late delivery of MATERIALS or PRODUCTS furnished by the OWNER, or acts or omissions of the OWNER, or by strikes or lock outs of the OWNER'S forces, the CONTRACTOR shall be compensated for any additional costs thereby incurred, and the completion date, subject to paragraph 38.5 shall be changed. The amount of the compensation and the extent of change in completion date shall be determined in the first instance by the ENGINEER.

38.3. If the CONTRACTOR is delayed in performance of THE WORK by a Suspension of Work Notice by the OWNER and if the period of suspension is thirty (30) calendar days or less, the Contract time shall be extended by the period of suspension plus six (6) calendar days, subject to the condition of paragraph 38.5.

38.4. If the CONTRACTOR is delayed in the performance of THE WORK by a Stop Work Order issued by a court or other public authority, and provided that such Order was not issued as a result of any act or fault of the CONTRACTOR, or of anyone employed by him directly or indirectly, then the CONTRACTOR shall be entitled to claim compensation for additional costs thereby incurred, and the completion date, subject to paragraph 38.5, shall be changed. The amount of compensation and the extent of change in completion date shall be determined in the first instance by the ENGINEER.

38.5. If the Completion Date is changed in accordance with paragraphs 38.2, 38.3 or 38.4, then, with respect to the new Completion Date, time is of the essence.

38.6. The CONTRACTOR shall provide to the OWNER within 28 days of a delay being known, or should have reasonably been know, written notice of all delays for which it is the CONTRACTOR'S intention to claim either an extension of completion time or costs resulting from the delay or both.

38.7. Impact Delays are those delays which arise out of the OWNER'S requirement of the CONTRACTOR to perform CHANGES IN THE WORK.

38.8. Impact delays may be a) certain to occur, b) foreseeable, but not certain to occur, or c) not foreseeable. At the time of submitting a QUOTATION FOR CONTEMPLATED CHANGE, the CONTRACTOR shall identify his intention, if any, to claim for Impact Delays, and provide justification for such claims or intentions to claim so that these can be negotiated and agreed upon in the CHANGE ORDER.

38.9. No claim for Impact Delays shall be valid or enforceable except as provided for in a CHANGE ORDER.

38.10. If the CONTRACTOR shall fail to complete THE WORKS within the time for completion prescribed in the Contract, or any extended time for completion in accordance with the Contract, then the CONTRACTOR shall pay to the OWNER the sum specified in the Contract as liquidated damages, for the delay between the time prescribed in the Contract or the extended time for completion, as the case may be, and the date of substantial completion of THE WORKS as stated in the Certificate of Substantial Completion, subject to the applicable limit stated in the Contract. The said sum shall be payable by the sole fact of the delay without the need for any previous notice or any legal proceedings, or proof of damage, which shall in all cases be considered as ascertained. The OWNER may, without prejudice to any other method of recovery, deduct the amount of such liquidated damages from any monies in its hands due or which may become due to the CONTRACTOR. The payment or deduction of such damages shall not relieve the CONTRACTOR from his obligation to complete THE WORKS or from any other of his obligations and liabilities under the Contract.

38.10.1. If, before the time for completion of the whole of THE WORKS or of a Section of THE WORKS, a Certificate of Substantial Completion has been issued for any part or Section of THE WORKS, the liquidated damages for delay in completion of the remainder of THE WORKS or of that Section may, for any period of delay after the date stated in such Certificate of Substantial Completion, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part or Section so certified bears to the total value of the whole of THE WORKS or Section, as applicable. The provisions of this Sub- Clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.

38.10.2. If the total amount due to the OWNER exceeds any payment due to the CONTRACTOR, the difference shall be a debt payable to the OWNER.

38.10.3. The liquidated damages for the whole of THE WORKS are non-negotiable and liquidated damages shall apply (Refer to Section 00 53 00).

39. REMEDIES

39.1. The specific remedies to which the CONTRACTOR and the OWNER may resort under the terms of the CONTRACT DOCUMENTS are cumulative and are not intended to be exclusive of any other remedies to which the CONTRACTOR and the OWNER may be lawfully entitled in a case of breach or threatened breach of any covenant, term or provision of the CONTRACT.

39.2. The waiver by the OWNER or ENGINEER of any breach of any covenant or warrant in the CONTRACT shall not be construed as a waiver of any future breach of the same terms of the Contract, and the approval by the OWNER or ENGINEER of any act by the CONTRACTOR or SUBCONTRACTOR shall not be construed as an approval to any subsequent similar acts by the CONTRACTOR or SUBCONTRACTOR.

---------- END OF SECTION 00 70 00----------

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

.1 In general, the Work of this Contract consists of the rehabilitation Runway 06-24 and Taxiway Alpha at the Moosonee Airport in Moosonee, ON. This generally involves, but is not necessarily limited to:

- .1 Civil work as follows:
  - .1 Installation and maintenance of Erosion Control measures.
  - .2 Pulverize, add additional granular material place, compact and fine grade of the existing Runway 06-24 and Taxiway Alpha.
  - .3 Any excess pulverized material to be stockpiled on airport property.
  - .4 New performance grade asphalt for the existing Runway 06-24 and Taxiway Alpha.
  - .5 New painted lines and markings.
  - .6 Supply and installation of new duct crossings for future electrical works.
- .2 Common work elements as follows:
  - .1 Full project quality control.
  - .2 Submission and execution of specified plans and related requirements.
  - .3 Demolitions, removals, disposals and relocations.
  - .4 Underground utility locates.
  - .5 Temporary Works, fencing and barriers.
  - .6 Project phasing.
  - .7 Environmental protection measures.
  - .8 Reinstatement of all incidentals.

.2 List of Drawings:

C-001 TITLE SHEET
C-010 GENERAL SITE PLAN
C-020 SAFETY AND PHASING PLAN
C-050 LAYOUT PLAN RUNWAY 06-24
C-051 LAYOUT PLAN RUNWAY 06-24
C-052 LAYOUT PLAN RUNWAY 06-24
C-053 LAYOUT PLAN RUNWAY 06-24
C-060 LAYOUT PLAN TAXIWAY “A”
C-100 GRADING AND PROFILE PLAN RUNWAY 06-24
C-101 GRADING AND PROFILE PLAN RUNWAY 06-24
C-102 GRADING AND PROFILE PLAN RUNWAY 06-24
C-103 GRADING AND PROFILE PLAN RUNWAY 06-24
C-104 SPOT GRADE PLAN RUNWAY 06-24

C-105 SPOT GRADE PLAN RUNWAY 06-24
C-106 SPOT GRADE PLAN RUNWAY 06-24
C-107 SPOT GRADE PLAN RUNWAY 06-24
C-110 GRADING AND PROFILE PLAN TAXIWAY "A"
C-111 SPOT GRADE PLAN TAXIWAY "A"
C-200 TYPICAL SECTIONS AND DETAILS
C-300 LINE MARKING PLAN
C-301 LINE MARKING PLAN
C-303 LINE MARKING PLAN
C-400 CROSS SECTIONS - 1
C-401 CROSS SECTIONS - 2
C-402 CROSS SECTIONS - 3
C-403 CROSS SECTIONS - 4
C-404 CROSS SECTIONS - 5
C-405 CROSS SECTIONS - 6

1.2 FAMILIARIZATION WITH SITE

.1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.

.2 Obtain prior permission from the Airport Representative before carrying out such site inspection.

1.3 CODES AND STANDARDS

.1 Perform Work in accordance with all guidelines and rules outlined in these Contract Documents and as shown on the Contract Drawings.

.2 Comply with all rules, regulations and bylaws of municipalities and other governing bodies in any manner affecting operations pursuant to the Contract.

.3 Perform work in accordance with the TP 312E – Aerodrome Standards and Recommended Practices 5th Edition September 15th, 2015, Ontario Provincial Specifications and Drawings (OPSS/OPSD), and the 2010 National Building Code of Canada and any other code of provincial or local application, including all amendments up to bid closing date, provided that in any case of conflict or discrepancy, the more stringent requirement apply.

.4 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

.5 Ensure that all agents and employees comply with all guidelines, rules and regulations, as required by the Contract Documents.

1.4 INTERPRETATION OF DOCUMENTS

.1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual.

1.5 SITE CONDITIONS

.1 For purposes of the Work, condition of the Site is deemed to be that which existed at time of Tender Acceptance.

.2 Note that the existing base information contained on the Contract Drawings is the best available at the time of preparation and may not be accurate or complete in all respects. Contractor shall confirm accuracy and completeness as necessary to complete Contract Works, including exposing concealed piping, ducts, cables and other services. No claims will be entertained by the Owner related to the accuracy or completeness of existing base information contained on Contract Drawings or other project documentation.

.3 Prior to start of construction, conduct a condition inspection of the Work Site and the immediate vicinity in the presence of Airport Representative and applicable subcontractors and tertiary trades. During the inspection, document any deficiencies, damage, etc. and have such findings acknowledged by all parties involved. For record purposes, the Airport Representative may at the time of inspection, or at any other time, videotape or photograph the condition of Work Site.

1.6 CONTRACTOR USE OF PREMISES

.1 The Project Site will be for the exclusive use of the Contractor except where the Contractor must interact with other contractors and utility companies at the Airport and except where segments of the Work are considered by the Airport Representative as substantially completed and allowed to be opened for aircraft traffic or for other airport operations, in accordance with the construction phasing plan shown on Contract Drawings or directed. The Contractor should review the documents to become familiar with the work of other contractors and make themselves aware of the adjacent work that is underway. Additional cost incurred to coordinate with other contractors and to maintain access roads, as required, should be included in the Contract Amount and within the limitations stipulated herein above. Comply with Airport Operations requirements in working within Restricted Areas of the Airport.

.2 Notwithstanding the Contractor's permitted use of the premises, the Contractor shall comply with all Airport security and operational requirements, regulations and directives when working in designated Restricted Areas of the Airport.
Do not unreasonably encumber the Work Site with materials and equipment. At no time shall public, Airport or Airline Operational or Emergency Response access/egress routes be blocked or obstructed by materials or equipment, unless previously authorized by the Airport Representative.

.3 Assume full responsibility for protection and safe- guarding of products under this Contract.

.4 Move stored products or equipment which interferes with operations, with Airport Representative, other contractors or

Airport and/or Airline Operations and Facilities at no additional cost.

.5 Limit use of premises for Work, for storage, and for access, to allow:

.1 Owner access.

.2 Partial owner occupancy.

.3 Work by other contractors.

.4 Engineer's access.

.5 Others as directed.

.6 Coordinate use of premises under direction of Airport Representative.

1.7 PARTIAL OWNER OCCUPANCY

.1 Schedule and complete designated portions of Work for Owner's Partial Occupancy prior to Substantial Performance of entire Work and in accordance with the approved construction staging plan(s) or as directed. Arrange and pay for inspection required by Authorities having Jurisdiction for areas requiring partial occupancy.

.2 Owner or Airlines will occupy designated portions of the Work for the purpose of incorporating such portions for Airport Operations and the Contractor is to complete such portions as scheduled and in compliance with Airport safety, security and operational requirements.

.3 Execute work prior to Owner Partial Occupancy and allow for:

.1 Access by Owner and/or Airline personnel

.2 Use of facilities.

.3 Operation of mechanical and electrical systems.

.4 Others as directed

.4 On occupancy, the Airport Representative will provide for occupied areas:

.1 Operation of mechanical, electrical, security and other systems.

.2 Maintenance of facilities except for Work under warranty.

.3 Security.

.4 Safety

.5

.5 Partial Occupancy by the Owner or Airlines of any portion of the Work, as defined above, will not relieve the Contractor of his obligation to warranty and rectify defects in the whole of the Work within twelve (12) months from the date of the Substantial Performance Certificate.

1.8 ADDITIONAL DRAWINGS

.1 Airport Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with the Plans referred to in the Contract Documents.

1.9 SCALING OF DRAWINGS

.1 Drawings cannot be used to scale locations of items such as catchbasins, manholes, signs, lights, pulpits, ducts, etc. Positions cannot be determined by scaling and/or by extracting coordinates from digital drawing files which may be provided by the Airport Representative. All critical item locations must be calculated and staked out using provided data, dimensions, standards and specifications and taking into account existing conditions.

1.10 SETTING OUT WORK

.1 Conduct a layout of the proposed Runway and Taxiway Alpha and associated infrastructure (sewers, electrical, etc) as per the contract documents.

.2 Set grades and lay out work in detail from control points and grades indicated.

.3 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.4 Provide devices needed to lay out and construct work.

.5 Supply such devices as straight edges and templates required to facilitate Airport Representative's inspection of work.

.6 Supply stakes and other survey markers required for laying out work.

.7 Maintain a complete, accurate log of control and survey work as it progresses. Submit according to Section 01 33 00.

.8 Contractor to notify Airport Representative prior to the commencement of excavation work on site.

1.11 MEASUREMENT FOR PAYMENT

.1 Notify Airport Representative sufficiently in advance of operations to permit required measurements for payment.

1.12 DOCUMENTS REQUIRED

.1 Maintain at job site, one (1) copy each of the following:

- .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 Report
.9 Copy of Approved Work Schedule
.10 Manufacturers' installation and application instructions
.11 Material Safety Data Sheets (MSDS)
.12 Red-marked as-built drawings
.13 Health and Safety Plan and other safety related documents
.14 Other documents as stipulated elsewhere in the Contract Documents.

1.13 PERMITS

.1 In accordance with the General Conditions, obtain and pay for building permit, certificates, licenses and other permits as required by municipal, provincial and federal authorities.

.2 Provide appropriate notifications of project to municipal and provincial inspection authorities.

.3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.

.4 Submit to Airport Representative, copy of application forms and approval documents received from above referenced authorities.

1.14 ALTERATIONS, ADDITIONS OR REPAIRS

.1 Execute work with least possible interference or disturbance to airfield operations. Arrange with Airport Representative to facilitate execution of work.

.2 Where security has been reduced by work of Contract, provide temporary means to maintain security.

.3 Provide temporary dust screens, barriers, warning signs in locations where work is adjacent to areas which will be operative during such work.

1.15 CUTTING, FITTING AND PATCHING

.1 Confirm cutting and patching required by all trades is included in total bid price submitted for the work.

.2 Execute cutting, including excavation, fitting and patching required making work fit properly.

.3 Where new infrastructure connects with existing and where existing infrastructure is altered, cut, patch and make good to match existing infrastructure.

.4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.16 EXISTING ELECTRICAL LIGHTING SERVICES AND SYSTEMS

.1 Before commencing work, establish location and extent of electrical and service lines in area of work and notify Airport Representative of findings.

.2 Where work involves breaking into or connecting to existing services, carry out work at times directed by Airport Representative with minimum of disturbance to operations.

.3 Submit schedule to and obtain approval from Airport Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Airport Representative and confirm findings in writing.

.5 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off or terminate in a manner approved in writing by the Airport Representative. Record locations of maintained, re-routed and abandoned service lines.

1.17 SMOKING ENVIRONMENT

.1 No smoking is permitted on site. The airport has designated the Restricted Areas (Airside) of the Airport as a strict “NO SMOKING” environment. Smoking within vehicles situated in Restricted Areas of the Airport will also not be permitted. This policy applies equally to all staff and Contractor's employees. Contractors are required to bring this policy to the attention of all of their employees, subcontractors, suppliers and trades who will be required to conduct activities within the Restricted Airport Areas and shall rigidly enforce this policy.

1.18 SUBMITTALS

.1 Administrative:

.1 Submit to Airport Representative submittals listed for all materials and procedures requiring approval as indicated. Submit electronically (PDF file format) in a timely manner and orderly sequence so as to not cause delay in the Work.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Review submittals prior to submission to Airport Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of the Work and Contract Documents.

.4 Verify field measurements and affected adjacent Work are coordinated.

.5 Refer to Section 01 33 00 for detailed submittal procedures.

.2 Interim Survey and Data Records:

.1 Provide total station interim survey records and ASCII data files in electronic format, compatible with issued for construction contract documents, by 1400 hours each Friday throughout the duration of construction.

.3 As-built Drawings and Total Station Survey Data:

.1 After award of Contract, Contractor will use a clean set of drawings for purpose of maintaining as-built drawings. Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Airport Representative.

.2 Record locations of concealed components of mechanical and electrical services.

.3 Identify drawings as "AS BUILTS". Maintain in new condition and make available for inspection on site by Airport Representative.

.4 Provide final total station survey to Airport Representative upon project substantial completion.

.1 Pavement surfaces to be surveyed on maximum 25m grid intervals.

.2 Unpaved surfaces to be surveyed at sufficient intervals to permit accurate generation of 0.25m contours.

.5 On completion of Work and prior to final inspection, submit record documents to Airport Representative.

.6 The certificate of substantial performance will not be issued until as-built drawings and completed total station survey have been completely provided.

.7 Refer to Section 01 78 00 for complete as-built and survey requirements.

.4 Operations and Maintenance Data:

.1 Submit electronic (PDF file format) copies of the following, or as indicated in the Contract Documents, prior to application for Final Payment:

.1 General description, list of equipment including

.2 nameplate information, installation, operation and

.3 maintenance instructions, and parts list.

.4 Names, addresses and phone numbers of Sub

.5 Contractors, suppliers and manufacturers.

.6 Guarantees and warranties.

.2 Type lists and notes. Use clear drawings, diagrams and manufacturer's literature.

.3 The certificate of substantial performance will not be issued until this material has been completely provided.

.4 Refer to Section 01 78 00 for complete Operation and Maintenance manual requirements.

1.19 QUALITY ASSURANCE

.1 Inspection:

.1 Airport Representative shall have access to the Work at all times.

.2 Airport Representative's Independent Inspection Agencies:

.1 Independent Inspection/Testing Agencies will be engaged by Airport Representative for purpose of Quality Assurance. Cost of such services will be borne by Airport.

.2 Provide heavy equipment assistance as required for executing inspection and testing by Airport appointed agencies.

.3 Provision of Airport Representative's quality assurance does not relieve Contractor's responsibility for quality control.

1.20 QUALITY CONTROL

.1 Refer to Section 01 45 00 for full requirements of the Contractor's Quality Control program.

1.21 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

.1 Installation/Removal:

.1 Provide construction facilities and temporary controls in order to execute work expeditiously and safely.

.2 Remove from site all such Work after use.

.2 Dewatering:

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

.3 Site Storage/Loading:

.1 Confine the Work and operations of employees to limits indicated by Contract Documents. Do not unreasonably encumber site with products or equipment.

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

.4 Water Supply:

.1 Provide water supply from own source.

.5 Project Cleanliness:

.1 Maintain the Work in tidy condition, free from Foreign Object Damage (FOD), accumulation of waste products and debris.

.2 Remove waste material and debris from site at end of each working day.

1.22 MATERIAL AND EQUIPMENT

.1 Product and Material Quality:

.2 Products, materials, equipment and articles (referred to as Products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. Furnish evidence as to type, source and quality of Products provided.

.3 Workmanship:

.1 Workmanship to be best quality, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Airport Representative if required Work is impractical to produce required results.

.2 Do not employ any unfit person or anyone unskilled in their required duties.

.3 Decisions as to quality or fitness of workmanship in cases of dispute rest solely with Airport Representative, whose decision is final.

1.23 EQUIVALENTS AND ALTERNATIVES

.1 No equivalent or alternative products will be made before acceptance of bids.

.2 After award of Contract, the Contractor may apply, in writing, for substitutions. Otherwise the Contractor will be held to terms of specifications. No extra will be allowed for approved equivalents.

.3 When the Airport Representative is prepared to approve a brand of manufactured article as an alternate to any specified item, although the alternate brand may not be equivalent to that specified, it may be used but only after price adjustments have been negotiated and approved.

.4 If alternate requires modifications, adjustments or additions to the specified work, submit to Airport Representative these modifications, adjustments, or additions in same detail as included in the Contract Documents.

.5 Approval in principle by the Airport Representative of these modifications, adjustments, or additions in no way relieves the Contractor of any obligation or liability under the Contract to provide a complete finished product.

.6 No change or substitution can be made without written consent of the Airport Representative.

1.24 FIRE SAFETY PLAN

.1 Provide Airport Representative with a Fire Safety Plan at the pre-construction meeting.

1.25 PROJECT CLOSEOUT

.1 Final Cleaning:

.1 When the Work is substantially performed, remove surplus products, tools construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste materials and debris from site at regularly scheduled times or dispose of as directed by Airport Representative. Do not burn waste materials on site.

.3 Leave work broom clean before inspection process commences.

.2 Inspection/Takeover Procedures:

.1 Prior to application for completion inspection by the Airport Representative, carefully inspect the Work and confirm it is complete, that major and minor construction deficiencies are complete and defects are corrected. Notify Airport Representative in writing, of satisfactory completion of the Work and request an inspection.

.2 During Airport Representative's inspection, a list of deficiencies and defects will be tabulated. Correct same.

.3 When the Airport Representative considers deficiencies and defects have been corrected and requirements of Contract have been performed, make application for final certificate of completion in accordance with General Terms and Conditions.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION PHASING, SCHEDULE AND HOURS OF WORK

.1 The Work is to be performed in phases, consisting of areas as indicated in the project drawings C-020.

.2 Flight Operations will be active 24 hours a day, seven (7) days per week. The runway and its associated navigation aid systems must be kept operational during this time. Flight Operations are not permitted to be interrupted by construction.

.3 The Contractor is permitted to work 24 hours, seven days per week. However, the Work conducted with in the Runway intersection area may only be performed during non-peak operations hours The Contractor must supply sufficient resources to complete the Work within the non-peak time limits specified herein. Any and all requests for exceptions to the hours of work will NOT be authorized by the Airport Representative under any circumstances.

.4 The Contractor must allow for time and resources in the construction schedule for a FOD (Foreign Object Damage), Flight Safety and Temporary Visual Aides (Runway Temporary Lighting and Markings) inspection to be conducted towards the end of each work day by the Airport Representative. The inspection will commence upon documented notification by the Contractor to the Airport Representative that he has prepared the site for Operations and is ready for inspection. The Contractor must ensure that the transition from construction to Operations is able to be approved by the Airport Representative and that the transition occurs by 0700 hours (7:00 AM) daily without exception.

1.2 OPERATIONAL RESTRICTIONS

.1 Airfield operations will be affected by implementation of this contract. Perform the work with utmost regard to the safety of flight operations. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the site without providing temporary works for flight safety.

.2 Meet with the Airport Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.

.3 The Airport Representative reserves the right to stop certain work activities, if the nature of that activity generates excessive noise or dust and have the Contractor re-schedule that particular work.

.4 See Sections 01 35 54 and 01 35 13 in regards to:

.1 Special security requirements which must be observed in the course of work.

.2 Provision of security personnel by Contractor as part of the Work.

.5 Safety Signage and Temporary Paint Marking:

.1 Provide onsite, and erect as required during progress of work, proper bilingual signage, mounted on self-supporting stands, warning of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas.

.2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Airport Representative.

.3 Generally maximum size of sign should be in the order of 1.0 square metres. Number of signs required will be dependent on area under construction at any one time.

.4 Provide temporary paint markings as indicated on drawings.

.6 FOD (Foreign Object Damage), Dust and Dirt Control:

.1 See Sections 01 50 00 and 01 74 11 for FOD, dust control and cleaning requirements.

.2 Effectively plan and implement FOD and dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Airport Representative before undertaking work, especially for major dust generating activities.

.3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.

.4 As work progresses, maintain construction areas in a tidy condition at all times. Remove FOD and dust accumulations by sweeping immediately following the completion of any FOD generating activity.

.5 Inform workers and make them sensitive to the need for FOD and dust control. Stringently enforce rules and regulations, immediately address non-compliance.

.7 Work in Occupied Areas:

.1 Ensure that all dust, dirt, debris, construction waste, materials, tools and equipment are completely removed at the end of each work shift.

.2 Conduct work in such a way as to minimize the creation of FOD and dust and to avoid contaminating areas beyond the immediate location.

.8 Make all sub-trades aware of and abide by the contents of this section and in particularly the Work restrictions specified herein applicable to airfield operational and safety requirements.

1.3 SUBMITTALS

.1 Upon acceptance of bid and prior to commencement of work, submit to Airport Representative the following work management documents:

.1 Work Schedule as specified herein.

.2 Shop Drawing Submittal Schedule specified in Section 01 33 00.

.3 Waste Management Plan specified in Section 01 74 22.

.4 Environmental Plan specified in Section 01 35 43.

.5 Health and Safety Plan specified in Section 01 35 29.

.6 Fire Safety Plan.

.7 Dust Control Plan specified in Section 01 50 00.

.8 Project Organization Chart specified in Section 01 35 54.

1.4 WORK SCHEDULE

.1 Upon acceptance of bid submit:

.1 Provide detailed work schedule within seven (7) calendar days of contract award.

.2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.

.3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.

.4 Detailed Work Schedule:

.1 Prepare by use of Critical Path Method (CPM) indicating:

.1 Complete and detailed sequence of all construction activities. Show projected start and completion dates for each activity.

.2 Number of calendar days required to carry out each activity

.3 Critical path items with resulting critical dates, non-critical activities and resulting float time.

.4 Actual workdays from non-working days such as weekend and statutory days etc.

.5 Projected and actual percentage of work completed for each major work activity.

.2 Prepare CPM schedule by use of well recognized and widely used electronic software. Submit copy of schedule in paper format and one (1) electronic version on CD for each submission.

.3 Accompany CPM with written narrative as required and in sufficient detail to fully describe work and demonstrate a reasonable implementation plan for completion of project within designated time.

.5 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified and indicated on drawings.

.6 Schedule work in cooperation with the Airport Representative. Incorporate within Work Schedule, items identified by Airport Representative during review of schedule.

.7 Completed schedule shall be approved by Airport Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Airport Representative's approval.

.8 Make all sub trades and subcontractors aware of the work restraints and operational restrictions specified.

.9 Schedule Updates:

.1 Submit bi-weekly.

.2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.

.3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.

.10 Airport Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Airport Representative. Address and take corrective measures on items identified by reviews and as directed by Airport Representative. Update schedule accordingly.

.11 In every instance, change or deviation from the Work Schedule will be subject to prior review and approval by the Airport Representative.

.12 Please refer to dwg C-015 for the preliminary construction works schedule and phasing.

1.5 PROJECT MEETINGS

.1 Schedule and administer project meetings, minimum weekly basis, for entire duration more often when directed by Airport Representative as deemed necessary due to work or particular situation.

.2 Prepare agenda for meetings.

.3 Notify participants in writing two (2) days in advance of meeting date.

.1 Ensure attendance of all subcontractors.

.2 Airport Representative will provide list of other attendees to be notified.

.4 Provide physical space and make arrangements for meetings. Hold meetings at project site or where approved by Airport Representative.

.5 Preside at meetings and record minutes.

.1 Indicate significant proceedings and decisions. Identify action items by parties.

.2 Distribute to participants by mail or by facsimile within two (2) calendar days after each meeting.

.3 Make revisions as directed by Airport Representative.

.4 Airport Representative will advise whether submission of minutes by email is acceptable. Decision will be based on compatibility of software among participants.

1.6 WORK COORDINATION

.1 Coordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities and construction facilities. Other contractors may be working on the site at the same time on other projects outside the scope of the Work.

.2 Project construction activities are to be confined to the area within the construction site boundary indicated except when otherwise authorized by the Airport Representative.

.3 The Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other. Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.

.4 The Contractor will convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required.

.1 Provide each trade with the plans and specs of the interfacing trade, as required, to assist them in planning and carrying out their respective work.

.2 Develop coordination drawings when deemed required illustrating potential interference between work of various trades and distribute to all affected parties.

.3 Review coordination drawings at purposely called meetings. Have subcontractors sign-off on drawings and publish minutes of each meeting.

.4 Submit copy of coordination drawings and meeting minutes to Airport Representative for information purposes.

.5 No extra costs to the Contract will be considered by the Airport Representative as a result of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor to be resolved at own cost.

1.7 WORK BY OTHERS

.1 Other contractors may be working on the site at the same time on other projects outside the scope of the Work.

1.8 CONTRACTOR’S PERSONNEL

.1 Make available on a full time basis a Site Superintendent to supervise all aspects of the Work. This individual is to be present at and identified in the pre-construction meeting.

.2 Its supervisory employees carry out their duties in a diligent and responsible manner with due consideration for health and safety of the workers; and

.3 All Subcontractors and their employees are properly protected from injury while they are at the work place.

.4 Make available on a full time basis a Contractor's QC Manager in accordance with Section 01 45 00

.5 The contractor shall provide adequate labour, Equipment and Material to ensure the completion of the Contract in accordance with Contract Documents.

.6 Workers employed to carry out the work possess the knowledge, skills and protective devices required by law or recommended for use by a recognized industry association to allow them to work safely.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 This Section details the measurement methods to be used for payment purposes. Unit price items and lump sum item measurement are full compensation for the work necessary to complete each item in the contract, in combination for all work necessary to complete the Work as a whole, and provided in accordance with the Construction Schedule and other plans indicated requiring submittal to and approval by the Airport Representative.

.2 The unit price items and lump sum item measurement will be full compensation for the work of the Item and will include but not be limited to the cost of furnishing all labour, materials, tools, construction utilities and equipment necessary to complete the work in accordance with the Contract, Drawings and Specifications, and will cover all costs of surety, mobilization, and assistance to the Airport Representative. Each item will include but not be limited to all necessary management, supervision, labour, materials, plant and services, security provisions, and all operations and allowances customary and necessary to complete each item and the Contract as a whole notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.

.3 The work of the unit price items and the lump sum item also include, but are not necessarily limited to the following:

- .1 Project Management.
- .2 Construction site control and coordination.
- .3 Plan and schedule submissions, and other submissions and reports as specified.
- .4 Assistance to Airport Representative.
- .5 Mobilization and demobilization.
- .6 Airport Representative's and Contractor's site offices.
- .7 Workers Lodging (Meals and Accommodations)
- .8 Regulatory requirements.
- .9 Coordination of work by external utilities.
- .10 Environmental protection measures beyond unit price items 1 and 2, maintenance and removal.
- .11 Pollution and sedimentation control.
- .12 Quality Control, independent laboratory monitoring, and independent laboratory testing and reporting.
- .13 Inspections as specified.
- .14 Site Security provisions, allowances and controls.

.15 Project phasing and associated temporary works including: pavement test strips (test strip per construction season), airfield transitional pavement construction, airfield lighting, markings, signage, utilities, roads, barriers and access.

.16 Removal of temporary airfield pavement, airfield lighting, markings, signage and associated works in accordance with project phasing requirements.

.17 Foreign Object Damage (FOD) control.

.18 Pavement sweeping.

.19 Dust control and snow clearing.

.20 Provision of water for construction and potable water.

.21 Construction hoarding and shoring.

.22 Control of water and dewatering.

.23 Collection and disposal off site of miscellaneous demolition materials, surplus materials, wastes and garbage.

.24 Protection of selected underground utilities.

.25 Reinstatement of disturbed surfaces with matching materials and thicknesses.

.26 Lights for Working During Night Time.

.1 Provide light adequate for working during the night and for good workmanship, inspection and safety.

.2 The illumination is to be a minimum of 50 horizontal lux throughout the work area and a minimum of 200 horizontal lux around the spreaders, rollers and other heavy equipment with ratio of 2:1 throughout work area.

.3 Use metal halide floodlight units mounted on portable masts and spaced along work area. Fit glare shields to the floodlight units to eliminate any direct illumination between the units and the Control Tower and runway approach. These glare shields must be adjustable. If requested by Control Tower personnel, adjust shields or reposition the lights to limit glare interference with airport traffic or the Control Tower. Always point light sources away from the Control Tower.

.4 Use mobile engine-driven generator units suitable to power one (1) or a group of lighting units.

.5 Illumination levels shall be calculated and measured in accordance with the standards of the Illumination Engineering society (IES) current practices.

.6 In addition to the above overall flood lighting, use smaller self- contained lighting units in other localized work areas to provide sufficient illumination to ensure that the installation does not suffer due to inadequate illumination.

.7 Keep sufficient number of spare units on site to eliminate any reduction in quality and illumination level in the work area at any time during construction, should any of the operating units fail.

.27 Construction Safety and Access:

.1 Provision of temporary signage and all equipment and personnel for construction safety and access control, all performed in accordance with Airport Representative approved plan.

.28 Temporary Traffic Control:

.1 Provision of traffic control and access including all equipment and personnel required for related temporary construction as specified in Section 01 50 00 and performed in accordance with Airport Representative approved plan.

.2 The Contractor shall ensure that all workers, including sub-contractors, in the Working Area are aware of the importance of the Traffic Control Plan measures.

.3 The Contractor shall be required to review and modify the TCP for errors, omissions, deficiencies, or because new hazards are identified and not previously addressed within the document.

.4 The condition of all traffic control devices shall be maintained for the duration of the contract.

.29 Painted Airfield Markings:

.1 Provision of permanent painted airfield markings in accordance with colour and geometrical configuration standards as specified and as indicated.

.30 Miscellaneous Demolition:

.1 Removal of existing miscellaneous infrastructure elements including, but not necessarily limited to excavation, removal and/or relocation of all signs and sign posts, fencing, wooden items, and backfill and reinstatement of surfaces which are not included in other pay items. This item also includes all electrical work associated with removals and relocations, and all work required to return relocated items to fully operational service where indicated.

.31 Commissioning.

.32 Training.

.33 Interim records and interim topographic survey data submissions, field records and topographic survey, and record drawings and Operations & Maintenance Manuals.

.34 Warranties.

.35 Cleaning.

.36 All other incidentals.

.4 All measurement shall be along a horizontal plane unless otherwise indicated.

.5 The numbers of the unit price items described in this Section correspond to the numbers of the Unit Price Table.

1.2 LUMP SUM ITEM

.1 No separate measurement for payment will be made for any work completed under this item.

.2 Measurement for lump sum item to be percentage completion basis.

.3 The work of the lump price items will include, but not necessarily be limited to the identified items in the unit price (bidders) list.

1.3 UNIT PRICE ITEMS

.1 For each unit price item, the calculation for payment will be based on tendered unit price and airport representative's determination of units of work item completed.

.2 The work of the unit price items will include, but not necessarily be limited to the identified items in the unit price (bidders) list.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Inspecting and testing by inspecting firms or testing laboratories designated by Airport Representative for the purpose of carrying out Quality Assurance testing.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Airport Representative are specified under various sections.

1.3 APPOINTMENT AND PAYMENT

.1 Airport Representative will appoint and pay for services of testing laboratory for purposed of Quality Assurance except as follows:

- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Mill tests and certificates of compliance.
- .4 Quality Control tests specified to be carried out by Contractor as indicated in Sections 01 45 00 and 01 91 00.
- .5 Additional tests specified in the following paragraph.

.2 Where tests or inspections by Airport Representative's designated testing laboratory reveal Work not in accordance with contract requirements, the Contractor will pay costs for additional tests or inspections as required by Airport Representative to verify acceptability of corrected Work.

1.4 CONTRACTOR’S RESPONSIBILITIES

.1 The Contractor is responsible for Quality Control. Refer to Section 01 45 00.

.2 Provide labour, equipment and facilities to:

- .1 Provide access to Work to be inspected and tested.
- .2 Facilitate inspections and tests.
- .3 Make good Work disturbed by inspection and test.
- .4 Provide storage on site for Airport Representative's laboratory's exclusive use to store equipment and store and/or cure test samples.

.3 Notify Airport Representative in accordance with Section 01 45 00 to allow for assignment of laboratory personnel and scheduling of tests.

.4 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.5 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Airport Representative.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Closeout Submittals: Section 01 78 00

1.2 SUBMITTAL GENERAL REQUIREMENTS

.1 This section specifies general requirements and procedures for submissions of shop drawings, product data, samples and as-built drawings to Airport Representative for review. Additional specific requirements for submissions are specified in individual sections of these specifications.

.2 Submit to Airport Representative for review requested submittals specified in various sections of the specifications including shop drawings, samples, permits, compliance certificates, test reports, work management plans and other data required as part of the work.

.3 Submit with reasonable promptness and in orderly sequence so as to allow for Airport Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.

.4 Do not proceed with work until relevant submissions have been reviewed.

.5 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.6 Where items or information is not produced in SI Metric units, provide soft converted values.

.7 Review submittals prior to submission. Ensure that necessary requirements have been determined and verified and that each submittal has been checked and coordinated with requirements of Work and Contract Documents.

.1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Airport Representative and considered rejected.

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Notify Airport Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.10 Contractor's responsibility for errors, omissions or deviations in submission from requirements of Contract Documents is not relieved by Airport Representative's review.

.11 Submittal format: high resolution PDF files by e-mail.

.12 Make changes or revision to submissions which Airport Representative may require, consistent with Contract Documents and resubmit as directed by Airport Representative. When resubmitting, identify in writing of any revisions other than those requested.

.13 Keep one (1) reviewed hard copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work.

.2 Shop Drawing Submittal Schedule:

.1 Submit within 10 working days of acceptance of bid a schedule listing all shop drawings to be submitted for project.

.2 Schedule shall be in format acceptable to Airport Representative and indicate proposed submission date for each item, status of review and anticipated product delivery date to site. Track all submissions for entire project.

.3 Revise schedule as work progresses. Identify items which have been reviewed and finalized and indicating those outstanding.

.4 Update schedule at stipulated dates or project time intervals predetermined and agreed upon with Airport Representative at commencement of Work.

.3 Shop Drawing Format:

.1 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.

.2 Non or poorly legible submittals will not be accepted and returned not reviewed.

.4 Shop Drawing Content:

.1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.

.2 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.

.3 Delete information not applicable to project on all submittals.

.5 Allow seven (7) calendar days for Airport Representative's review of each submission.

.6 Adjustments or corrections made on shop drawings by Airport Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Airport Representative in writing prior to proceeding with Work.

.7 If upon review by Airport Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.

.8 Be advised that costs and expenses incurred by Airport Representative to conduct more than one review of incorrectly prepared shop drawing submittal for a particular material, equipment or component of work may be assessed against the Contractor in the form of a financial holdback to the Contract.

.9 Accompany each submission with transmittal letter, containing:

.1 Date.

.2 Project title and project number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample

.5 Other pertinent data

.10 Submissions to include:

.1 Date and revision dates.

.2 Project title and project number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized Representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.

.6 Details of appropriate portions of Work as applicable.

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.11 After Airport Representative's review, distribute copies.

.12 The review of shop drawings by the Airport Representative or their designate is for sole purpose of ascertaining conformance with general concept. This review does not mean that the airport approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 SAMPLES

.1 Submit for review samples as specified in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples to Airport Representative's office or to other address as directed. Do not drop off samples at construction site except for pre-approved circumstances previously approved by Airport Representative.

.3 Notify Airport Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Adjustments made on samples by Airport Representative are not intended to change Contract Price. If adjustments will result in a cost increase to the Contract notify Airport Representative in writing prior to proceeding with Work.

.5 Make changes in samples which Airport Representative may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 INTERIM SURVEY RECORDS

.1 Provide interim total station survey record documents weekly as indicated in Section 01 10 10

.2 Provide total station topographied survey data of sufficient detail and resolution to allow accurate quantity take offs for purposes of volume and area measurements for payment to satisfaction of Airport Representative. Lack of sufficient data will cause delay or prevent payment of progress claims.

.3 Provide interim record and feature code data in CAD format.

1.6 AS-BUILT DRAWINGS

.1 As the Work progresses, indicate changes and deviations in the location of Work concealed by the finished Work, and such other approved changes that occur during progress of Work, to ensure that an accurate record is provided for future maintenance and alterations.

.2 Provide record and feature code data in CAD format.

.3 White prints will be provided by the Airport Representative. Record changes in the Work on these prints in red ink.

.4 Dimension location of concealed Work: indicate at which point dimension is taken to concealed Work. Dimension all terminations and offset of runs of concealed Work.

.5 Record Work constructed differently than shown on Contract Documents, changes in the work caused by site conditions, by Airport Representative, Contractor and subcontract originated changes, and by site instruction, supplementary instruction, field orders, change orders, addenda, correspondence and directions of jurisdictional authorities.

.6 Pay the cost of uncovering and making good facilities, systems and services, which have been installed prematurely, before specified as-built measurements have been obtained by the Contactor and approved by the Airport Representative.

.7 Contractor's responsibility for errors and omissions in submission is not relieved by Airport Representative's review of submissions.

.8 Record the following information:

.1 Location of utilities and appurtenances concealed in construction, referenced to visible and accessible features.

.2 Field changes of dimension and detail.

.3 Location of all capped or terminated services and utilities.

.4 Chases for mechanical, electrical and other services.

.5 Elevations.

.6 All design elevations and details dimensioned and marked-up to consistently report finished installation conditions.

.9 Adhere to the following Quality Control Tolerances:

.1 Take horizontal measurements to an accuracy of 25 mm plus or minus.

.2 Take vertical measurements to an accuracy of 25 mm plus or minus.

.3 Present all as-built drawing measurements in SI metric units.

.4 Measure elements which fall within the scope of the contract and locate in reference to the coordinate system used.

.10 Identify each as-built drawing as a "Project As-Built Copy". Maintain in good condition, do not use for construction purposes and make available to Airport Representative at all times. Submit electronic versions of all hard copy submissions on CD.

.11 Maintain in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Airport Representative's visual review will constitute proof that as-built drawings are current.

.12 Submit complete Project as-built drawings to the Airport Representative with application for Certificate of Completion.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 COORDINATION

.1 Prior to start of work Airport Representative will arrange for briefing of all Contractor's personnel by Airport Authority on procedures for movement of equipment and personnel, and work on, or adjacent to active runways, taxiways or parking aprons.

.2 All Contractor's personnel authorized to use airport for accessing the work site will be issued a special area visitor's pass. This pass must be kept on ones person at all times during working hours.

.1 All Contractor's personnel will be escorted by airport staff.

.3 The Contractor must be prepared to evacuate all personnel and equipment from operational surfaces and runway strip on 30 minutes notice to move. Contractor to coordinate with airport operations staff to ensure evacuated areas are approved by Airport Representative as made safe for air operations within required timeline.

1.2 PROTECTION

.1 Do not disrupt airport operations except as permitted by Airport Representative.

.2 Provide temporary protection to permit safe passage of all personnel, vehicles and aircraft in vicinity of Work.

.3 Provide barricades and signs, lighted by night or during poor visibility and flags by day where directed by the Airport Representative. These provisions shall prevent airport personnel from inadvertently crossing into construction areas and construction personnel from crossing into operational areas.

.4 Provide containers for debris and clean-up is performed as work progresses and at a daily rate to prevent FOD (Foreign Object Damage to Aircraft). Be diligent in preventing refuse, from Work on this project, from being windblown across the airport.

.5 Provide wetting down of surfaces and areas to prevent FOD or dusting hazards (such as ingestion into the aircraft engine or visibility to aircraft risks).

1.3 CLOSURE OF AIRSIDE FACILITIES

.1 Carry out work requiring interruption of airport operations at time directed, with minimum of disturbance to airport operations.

.2 Submit schedule to, and obtain approval from Airport Representative of interruptions or closure of active airport facilities. Adhere strictly to approved schedule.

1.4 COORDINATION OF MOVEMENT IN OPERATIONAL AREAS

.1 Brief Airport Representative every day prior to starting work in area adjacent to or on active airport facilities.

.2 Obtain Airport Representative's approval on scheduling of Work.

.3 Control movements of equipment and personnel as directed by Airport Representative.

.4 Obey signals from airport escort staff immediately.

1.5 FLIGHT SAFETY

.1 Prior to permitting personnel to work adjacent to an active runway, taxiways, parking aprons, or working within 60 m of active facility, establish contact with Airport Representative and obtain specific clearances. Once established on airport, maintain radio contact on work site with the airport escort staff at all times. Obey all instructions promptly and explicitly.

.2 The contractor shall obey the direction of the airport escort staff with regards to pullbacks.

.3 Obey all instructions promptly and explicitly.

.4 Prior to starting work obtain necessary closure of adjacent facilities.

.5 During working hours, supply flagmen at crossings of active facilities.

.6 All Contractor's vehicles used on the airport must be equipped with an orange rotary beacon or must be escorted by a vehicle equipped with a beacon.

1.6 UNSERVICEABLE AREAS

.1 Mark off areas made unserviceable for aircraft by work of this Contract by providing plainly visible danger markings by day and red lights by night. Open flames in flammable fuels not permitted.

.2 Coordinate demolition of unserviceable areas in accordance with Phasing Plan over course of construction.

.3 Park equipment not in use and stockpile materials in areas approved by Airport Representative so that equipment:

- .1 Tops are below a 50 (horizontal) to 1 (vertical) ratio from ends of useable landing strip.
- .2 Is below 20 (horizontal) to 1 (vertical) ratio from sides of aircraft traffic areas.
- .3 Is outside limits of pullback zones as indicated on Drawings.

.4 Where directed, mark equipment tops with red lights.

1.7 CLEANING FOD

.1 Foreign Object Damage (FOD) can occur anytime a foreign object comes in contact with an aircraft. Foreign objects are anything foreign to the airfield, including but not limited to: construction dust, hats, rags, pen caps, paper, rocks or mud from vehicle tires, etc.

.2 Foreign Object Damage (FOD) control procedures will be enforced by the Airport Representative at all times in the construction and operational area. Keeping active taxiways and aprons adjacent to the work clean during the Work will be the responsibility of the Contractor.

.3 Maintain at the construction site a Airport Representative approved, sufficiently sized and powered:

.1 Street sweeper tractor with power broom or similar vehicle, fitted with a non-metallic motorized rotary sweeper broom, minimum width 2.4m, for FOD control and clean-up of adjacent operational surfaces affected by construction activities. Site FOD sweeps shall be conducted at the end of each working day and when directed by the Airport Representative.

.2 Water truck capable of supplying enough water for dust control as well as construction needs.

.4 Where access routes cross active runways, taxiways or parking aprons, keep crossings free of FOD mud and debris at all times. Broom clean immediately.

.5 Routinely inspect and clean equipment as necessary to remove rocks, dirt and mud that may accumulate. Inspection and cleaning of equipment shall occur before equipment enters the airfield and before equipment transitions from airfield soil surfaces to runway, ramp or associated concrete or asphalt surfaces.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Procedures to isolate and lockout electrical facility and other equipment from energy sources.

1.2 REFERENCES

.1 CSA C22.1-12 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.

.2 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

1.3 DEFINITIONS

.1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.

.2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.

.3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).

.4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.

.5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.

.6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.4 COMPLIANCE REQUIREMENTS

.1 Comply with the following in regards to isolation and lockout of electrical facilities and equipment:

.1 Canadian Electrical Code

.2 Federal and Provincial Occupational Health and Safety Acts and Regulations.

.3 Procedures specified herein.

.2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Airport Representative will advise on the course of action to be followed.

1.5 SUBMITTALS

.1 Submit copy of proposed lockout procedures and sample of lockout permit or lockout tags to Airport Representative for review, within 14 calendar days of acceptance of bid.

.2 Submit in accordance with section 01 33 00.

1.6 ISOLATION OF EXISTING SERVICES

.1 Obtain Airport Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.

.2 To obtain authorization, submit to Airport Representative the following documentation:

.1 Written request to isolate the particular service or facility and;

.2 Copy of Contractor's Lockout Procedures.

.3 Make a Request for Isolation for each event, unless directed otherwise by Airport Representative, as follows:

.1 Fill-out standard form in current use at the Airport as provided by Airport Representative or;

.2 Where no form exist, make written request indicating:

.1 The equipment, system or service to be isolated;

.2 Duration of isolation period (ie: start time & date and completion time & date).

.3 Voltage of service feed to system or equipment being isolated.

.4 Name of person making the request.

.4 Do not proceed with isolation until receipt of written notification from Airport Representative

.5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.

.6 Plan and schedule shut down of existing services in consultation with the Airport Representative and the Airport Maintenance Manager. Minimize impact and downtime of Airport operations. Follow all directives in this regard.

.7 Conduct hazard assessment as part of the process in accordance with occupational Health and Safety Plan specified requirements.

1.7 LOCKOUTS

.1 De-energize, isolate and lockout electrical facility and equipment from all potential sources of energy prior to working on such item.

.2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.

.3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by workers to safely isolate equipment and electrical facilities and lockout/tag out all sources of energy.

.4 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.

.1 A lockout permit shall be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.

.2 Duties of person managing the permit system to include:

.1 Issuance of permits and lockout tags to workers.

.2 Determining permit duration.

.3 Maintaining record of permits and tags issued.

.4 Making a Request for Isolation to Airport Representative when required as specified above.

.5 Designating a Safety Watcher, when one is required based on type of work.

.6 Ensuring equipment or facility has been properly isolated.

.7 Collecting and safekeeping lockout tags returned by workers as a record of the event.

.5 Clearly establish, describe and allocate responsibilities of:

.1 Workers.

.2 Person managing the lockout permit system.

.3 Safety Watcher.

.4 Subcontractor(s) and General Contractor.

.6 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect site specific project requirements.

.1 Incorporate specific procedures in force at the Airport as provided by the Airport Manager through the Airport Representative.

.2 Clearly label the document as being the Lockout procedures applicable to work of this contract.

.7 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.

.8 Use industry standard lockout tags.

.9 Provide appropriate safety grounding and guards as required.

1.8 CONFORMANCE

.1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.

1.9 DOCUMENTS ON SITE

.1 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.

.2 Upon request, make available to Airport Representative or to authorized safety Representative for inspection.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

.1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

.2 Competent Person: means a person who is:

.1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;

.2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;

.3 Knowledgeable about potential or actual danger to health or safety associated with the Work.

.3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.

.4 PPE: personal protective equipment

.5 Work Site: where used in this section, Work Site means the areas located at the site where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.2 NIGHT WORK

.1 The contractor will have to submit a request to do night work. The Construction hours of work will take place during non peak hours. The Contractor's Health and Safety Plan must account for the increased project safety risk due to work taking place after dusk each day and the high intensity of work activity resulting from the limited construction schedule duration.

1.3 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan prior to commencement of Work.

.1 Submit within ten (10) work days of notification of Bid Acceptance. Provide three (3) copies.

.2 Airport Representative will review Health and Safety Plan and provide comments.

.3 Revise the Plan as appropriate and resubmit within ten (10) work days after receipt of comments.

.4 Airport Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

.5 Submit revisions and updates made to the Plan during the course of Work.

.3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.

.4 Submit building permit, compliance certificates and other permits obtained.

.5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.

.1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.

.6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.7 Submit copies of incident reports.

.8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act for Province of Ontario, and Occupational Health & Safety Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.

.1 The Canada Labour Code can be viewed at: www.http://laws.justice.gc.ca/en/L-2/

.2 COSH can be viewed at: www.http://laws.justice.gc.ca/eng/SOR-86-304/ n e.html

.3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800

.4 (1-800-635-7943) Publication No. L31-85/2000 E or F)

.3 Observe construction safety measures of:

.1 Part 8 of National Building Code

.2 Municipal by-laws and ordinances.

.4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.

.5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.

.6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

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

.2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 SITE CONTROL AND ACCESS

.1 For the purposes of this Contract, the term “Airside” shall mean all areas situated within “Restricted Areas” of the Airport. All other areas within the Airport property shall be referred to as “Groundside”.

.2 Personal vehicles of Contractor's, sub-contractor's, subtrades’ and suppliers' employees are to be parked in Contractor's yard or other groundside areas designated by Airport Representative or as indicated on Contract Drawings. Personal and construction vehicles without proper permitting and authorization will not be permitted.

.3 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.

.1 Airport Representative will provide names of those persons authorized to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.

.4 Isolate Work Site form other areas of the premises by use of appropriate means.

.1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 50 00 for minimum acceptable requirements.

.2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

.5 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

.6 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.7 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

.8 Comply with operational, safety and security and other applicable requirements in the execution of the Work and in working in close proximity of the live runway, taxiways, taxilanes and aprons including but not limited to the following:

.1 The integrity of all electronic and visual navigational aids associated with live aviation activities on Airside must be maintained for aircraft operations which take precedence over construction/haulage operations for the new facilities

.2 Construction operations and equipment must not impair the visual acuity or line-of-sight of flight services center operating from the terminal.

.3 Physical and visual impediments to airside operations must be avoided when the maneuvering surfaces are in service. Physical intrusions, such as motorized equipment, must comply with the Airport Zoning requirements in both horizontal and vertical directions. Any unanticipated violations of zoning found unavoidable during the course of the work, and not specifically addressed in the Contract Documents, must be coordinated with the Airport Representative a minimum of seven (7) days in advance of such work. Visual impediments, such as dust or fixed objects, must not be allowed to interfere with the line-of-sight from the flight services center or to Airfield Operations adjacent to the areas under construction or interfere with the electronic equipment such as the Instrument Landing System (ILS). Authorized physical intrusions shall have their highest points marked by red obstruction lights and shall be confirmed and coordinated by Airport Representative.

.4 Buried power, communication and control cables and other underground structures and services in the vicinity of the construction areas are to be identified, protected and maintained. Contractor is responsible for locating these utilities with vacuum excavation equipment.

.5 Emergency Response Services mobility must be preserved at all times. Operating Routes must be reviewed by Engineer on a bi-weekly basis to ensure that access is maintained at all times. Alternative and approved routes are to be established if new construction is anticipated to interfere with such access areas.

.6 Contractor is advised that due to the possibility of jet blast or any turbulence from aircraft, all markers or light fixtures must be rigidly fixed and tied down and all barriers and delineators must be adequately weighed down with bags or fixed by other approved means. Method of securing must be approved by Engineer prior to use. Do not fix markers and light fixtures to finished pavements to remain using destructive methods (e.g. nailing, etc.)

1.7 PROTECTION

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

.2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Airport Representative verbally and in writing.

1.8 FILING OF NOTICE

.1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.

.1 Airport Representative will assist in locating address if needed.

1.9 PERMITS

.1 Post permits, licenses and compliance certificates, specified in Section 01 10 10, at Work Site.

.2 Where a particular permit or compliance certificate cannot be obtained, notify Airport Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.10 HAZARD ASSESSMENTS

.1 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:

.1 Initial hazard assessment carried out immediately upon notification of contract award and prior to commencement of work.

.2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum, carry out hazard assessments when:

.1 New subtradework, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.

.2 The scope of work has been changed by Change Order.

.3 Potential hazard or weakness in current health and safety practices are identified by Airport Representative or by an authorized safety representative.

.3 Hazard assessments to be project and site specific, based on review of contract documents, site and weather conditions.

.4 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Airport Representative for inspection.

1.11 PROJECT/SITE CONDITIONS

.1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:

.1 Known latent site and environmental conditions:

.1 High water table.

.2 Soft grounds due to standing water.

.2 Facility on-going operations:

.1 Active runway operations.

.2 Active ramp operations.

.3 Airfield emergency response services.

.4 Existing Live Utilities (Visible and Underground)

.2 Above items will not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.

.3 Include above items in the hazard assessment of the Work.

.4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Airport Representative.

1.12 MEETINGS

.1 Attend pre-construction health and safety meeting, convened and chaired by Airport Representative, prior to commencement of Work, at time, date and location determined by Airport Representative. Ensure attendance of:

.1 Superintendent of Work.

.2 Designated Health & Safety Site Representative.

.3 Subcontractors.

.2 Provide site safety orientation session to workers and other authorized persons prior to granting them access to work site. Brief persons on site conditions and on the minimum site safety rules in force at site.

.3 Conduct site specific occupational health and safety meetings during the entire work as follows:

.1 Formal meetings on a minimum monthly basis.

.2 Informal tool box meetings on a regular basis from a predetermined schedule.

.4 Keep workers informed of anticipated hazards, on safety practices and procedures to be followed and of other pertinent safety information related to:

.1 Progress of Work.

.2 New sub-trades arriving on site.

.3 Changes in site and project conditions.

.5 Record and post minutes of meetings on site. Make copies available to Airport Representative upon request.

1.13 HEALTH AND SAFETY PLAN

.1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.

.2 Health and Safety Plan shall contain the following three (3) parts:

.1 Part 1: List of individual health risks and safety hazards identified by hazard assessments.

.2 Part 2: List of specific measures to control or mitigate each hazard and risk identified in part one of Plan. Describe the engineering controls, personnel protective equipment (e.g. High Visibilty clothing, protective footware etc.) and safe work practices to be implemented and followed when performing work related to each identified hazard or risk.

.3 Part 3: Emergency Measures and Communications Procedures as follows:

.1 Emergency Measures: on-site operating procedures, evacuation measures and emergency response to be implemented in the occurrence of an incident. Procedures to be specific and relevant to identified hazards. Measures to complement and be integrated with the facility and tenants Emergency Response Plans in place at site.

.2 On-site Contingency and Emergency Response Plan shall include:

.3 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.

.4 Evacuation Plan: site plan showing escape routes, marshalling areas. Details on alarm notification methods, emergency drills, location of firefighting equipment and other related data.

.5 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.6 Emergency Contacts: name and telephone number of officials from:

.7 General Contractor and subcontractors.

.8 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

.9 Local emergency resource organizations.

.10 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Airport Representative will provide pertinent data including name of Facility Management contacts:

.11 Communication Procedures:

.1 List of names and telephone numbers of designated officials, to be contacted should an incident or emergency situation occur, including the following:

.1 Contractor and all Subcontractors.

.2 Federal and Provincial Departments and local emergency resources organizations, as resources organizations, as applicable laws and regulations.

.3 Officials from facilities located in vicinity where work is carried out. Airport Representative will provide list of names to be included.

.2 Implement procedures at site to communicate and share information between workers, subcontractors, and General Contractor on work activities and in particular those which might endanger workers and employees.

.3 List of critical construction activities to be communicated with the Airport Representative which could affect operations, or pose a risk to the health and safety of employees and to the general public. Develop list in consultation with the Airport Representative.

.12 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

Column 1	Column 2	Column 3
Identified Hazard	Control Measures Implemented	Emergency Measures & Communications Procedures

.13 Develop Health and Safety Plan in collaboration with all subcontractors. Address all work and activities of subcontractors as they arrive on site. Immediately update Plan and submit to Airport Representative.

.14 Implement, maintain and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.

.15 As Work progresses, review and update Plan addressing additional health risks and safety hazards identified by on-going hazard assessments.

.16 Submit revised versions of Plan to Airport Representative.

.17 Post a typed written copy, including all updates, of the Health and Safety Plan in a common visible location at work site.

.18 Submission of the Health and Safety Plan, and updates, to the Airport Representative is for review and information purposes only. It's submission will not be construed to imply the approval by Airport Representative, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of their legal obligations for the provision Health and Safety on the construction project.

.19 Assign responsibility, obligation and authority to such designated person(s) to stop and start Work as deemed necessary for reasons of health and safety.

.20 Provide names of designated individuals to Airport Representative.

.21 Conduct regularly scheduled safety inspections of work site as follows:

.1 Informal Inspections: carry out on a minimum bi-weekly basis. Note deficiencies and remedial action taken in a log book or diary.

.2 Formal Inspections: carry out on a minimum monthly basis. Use standardized safety checklist forms. Prepare written report for each formal inspection. Document deficiencies, remedial action needed and assign responsibility for rectification to appropriate subcontractor or worker.

.22 Distribute monthly reports to subcontractors for their pursuance. Follow-up and ensure appropriate action and corrective measures are taken.

.23 Maintain safety inspection documentation on site. Submit copies of formal inspection reports to Airport Representative.

.24 All persons in Contractor's employ responsible for health and safety requirements specified in the Contract Documents to be competent in Occupational Health and Construction Safety as defined in the Provincial Occupational Health & Safety Act.

1.14 FIRE SAFETY REQUIREMENTS

.1 Comply with the requirements of standard for Construction Operations issued by the Fire Commissioner of Canada and local fire codes issued by the Office of the Fire Marshall.

.2 Handle and dispose of gasoline, diesel or other flammable and combustible liquids in accordance with the requirements of the Gasoline Handling Act.

.3 Place oily waste, rags and the like into suitable safety containers and remove from building at the end of each working day.

.4 When a fire occurs on Site or any extinguisher is used for any reason, submit a full written report to Airport Representative within 24 hours.

1.15 FIRE SAFETY PLAN

.1 In accordance with the National Fire Code prepare a fire safety plan identifying the following;

.1 Emergency procedures to be used in case of fire.

.2 Appointment of designated staff to carry out safety duties.

.3 Training of supervisory staff.

.4 Documents showing the type, location and operation of the buildings fire emergency systems.

.5 The control of hazards on site.

.6 The inspection and maintenance of the building facilities for fire fighting safety.

1.16 SAFETY SUPERVISION

.1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

.2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:

.1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work

.2 Monitor and enforce Contractor's site-specific Health and Safety Plan.

.3 Conduct site safety orientation session to persons granted access to Work Site.

.4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.

.5 Stop the Work as deemed necessary for reasons of health and safety.

.3 Health & Safety Site Representative must:

.1 Be qualified and competent person in occupational health and safety.

.2 Have site-related working experience specific to activities of the Work.

.3 Be on Work Site at all times during execution of the Work.

.4 All supervisory personnel assigned to the Work must also be competent persons.

.5 Inspections:

.1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.

.6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Airport Representative.

.7 Keep inspection reports and supervision related documentation on site.

1.17 TRAINING

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of training received. Make data available to Airport Representative upon request.

.3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Airport Representative verbally and in writing.

1.18 MINIMUM SITE SAFETY RULES

.1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:

.1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.

.2 Immediately report unsafe condition at site, near-miss accident, injury and damage.

.3 Maintain site and storage areas in a tidy condition free of hazards causing injury.

.4 Obey warning signs and safety tags.

1.19 TOOLS AND EQUIPMENT SAFETY

.1 Implement and follow a scheduled tool and equipment inspection/maintenance program at work site. Regularly check tools, equipment and machinery for safe operation and perform maintenance at pre-established time and frequency intervals as recommended by manufacturer. Include subcontractors equipment as part of the inspection process.

.2 Use standardized checklists to ensure established safety checks are stringently followed.

.3 Immediately tag and remove items found faulty or defective off site.

.4 Maintain written documentation on each inspection. Make available to Airport Representative upon request.

1.20 CORRECTION OF NON-COMPLIANCE

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

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

.3 Airport Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.21 INCIDENT REPORTING

.1 Investigate and report the following incidents to Airport Representative:

.1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.

.2 Medical aid injuries.

.3 Property damage in excess of $10,000.00.

.4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of $5,000.00.

.2 Submit report in writing.

1.22 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).

.2 Keep MSDS data sheets for all products delivered to site and:

.1 Post on site.

.2 Submit copy to Airport Representative.

1.23 BLASTING

.1 Blasting or other use of explosives is not permitted on site.

1.24 POWDER ACTUATED DEVICES

.1 Use of powder actuated fastening devices is not permitted onsite.

1.25 CONFINED SPACES

.1 Abide by occupational health and safety regulations regarding work in confined spaces.

1.26 SITE RECORDS

.1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.

.2 Upon request, make available to Airport Representative or authorized Safety Officer for inspection.

1.27 POSTING OF DOCUMENTS

.1 Post applicable items, articles, notices and orders in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.

.2 Post other documents as specified herein, including:

.1 Site specific Health and Safety Plan

.2 WHMIS data sheets.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Waste Management and Disposal: Section 01 74 22.

1.2 DEFINITIONS

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

1.3 PLANNING ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Airport Representative.

.3 Environmental Protection Plan must account for items covered in environmental report site conditions and include comprehensive overview of known or potential environmental issues to be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issues and required construction tasks.

.5 Include in Environmental Protection Plan:

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

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

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

.4 Descriptions of environmental protection personnel training program.

.5 Work Area Plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.6 Spill Response Plan including procedures, equipment, instructions, and reports to be used in event of unforeseen release or spill of regulated substance.

.7 Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris.

.8 Air Pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash are contained on project site.

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

.10 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.11 Watershed Management Plan that defines procedures for identifying and protecting storm runoff watershed area from construction activity and site contaminants.

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

1.4 FIRES

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

1.5 HAZARDOUS MATERIAL HANDLING

.1 Store and handle hazardous materials in accordance with applicable federal and provincial laws, regulations, codes and guidelines. Store in location that will prevent spillage into the environment.

.2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.

.3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.

.4 Store and handle flammable and combustible materials in accordance with National Fire Code.

.5 Transport hazardous materials in accordance with federal Transportation of Dangerous Goods Regulations and applicable Provincial regulations.

1.6 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site. Dispose in accordance with project waste management requirements specified in Section 01 74 22.

.2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.

.3 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

1.7 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.

.4 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good order for duration of work.

1.8 SITE AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Minimize stripping of topsoil and vegetation.

1.9 WORK ADJACENT TO WATERWAYS

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material

.3 Do not dump excavated fill, waste material or debris in waterways.

.4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with all environmental regulations.

.5 Do not skid logs or construction materials across waterways.

.6 Do not refuel any type of equipment within 100 metres of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.

1.10 POLLUTION CONTROL

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

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.

.5 Have appropriate emergency spill response equipment and rapid clean-up kit on site located adjacent to hazardous materials storage area. Provide personal protective equipment required for clean-up.

.6 Report spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment to Federal and Provincial Department of the Environment.

.1 Notify Airport Representative and submit a written spill report to Airport Representative within 24 hours of occurrence.

1.11 WILDLIFE PROTECTION

.1 Should nests of migratory birds in wetlands be encountered during work, immediately notify Airport Representative for directives to be followed.

.1 Do not disturb nest site and neighboring vegetation until nesting is completed.

.2 Minimize work immediately adjacent to such areas until nesting is completed.

.3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.12 SPILL RESPONSE

.1 The Spill Response Plan must be able to be implemented to enable rapid and effective response in the event of a release or spill.

.2 Maintain response equipment readily available on site. Response equipment such as absorbent material and open-ended barrels for collection of cleanup debris shall be stored in an accessible location on site. Open-ended barrels must be UN performance packaging certified open head drums.

.3 Personnel working on the project must be knowledgeable about spill response procedures.

.4 Refueling and maintenance of equipment must only occur at approved area on level, hard surface areas away from sensitive receptor such as drainage areas.

.5 All heavy equipment, machinery and tools must be free from leaks. Repair or remove from the site any faulty equipment/machinery immediately.

1.13 CONTROL FEATURES

.1 Provide and maintain erosion and sedimentation control features where required, as directed, or as indicated prior to construction. Co-ordinate locations with Airport Representative. Do not remove control features until authorized by the Airport Representative.

1.14 SEDIMENT CONTROL FENCE

.1 Sediment control fence: preassembled silt fence with industrial woven geotextile fabric pre-stapled to wood posts spaced as indicated:

Test Method		Unit	Minimum Average Roll Value MD/CD__
ASTM D 4632 -	Grab Tensile Strength	N	550
ASTM D 4632 -	Grab Tensile Elongation	%	15
ASTM D 3786 -	Mullen Burst Strength	kPa	2000
ASTM D 4833 -	Puncture Strength	N	250
ASTM D 4751 -	Apparent Opening Size (AOS)	mm (U.S. Sieve)	0.600
ASTM D 4491 -	Permittivity	sec^{-1}	0.10
ASTM D 4491 -	Flow Rate	$1/min/m^2$	400
ASTM D 4355	UV Resistance (at 500 hours)	% strength retained	70

.2 Install sediment control fence in the locations directed and as required.

.3 Install extra 50 mm x 75 mm x 1200 mm long posts at midpoints between supplied posts. Attach fence with roofing nails and roofing tins. Provide wood strapping along top of fence as shown.

.4 Excavate 150 x 150 mm trench along length of fence as indicated. Lay fabric bottom in trench and backfill with selected excavated material.

Property	Test Method	Metric
Weight-Typical	ASTM D-5261	325 g/sm
Tensile Strength	ASTM D-4632	1,100 N
Elongation @ Break	ASTM D-4632	50 %
Mullen Burst	ASTM D-3786	3,400 kPa
Puncture Strength	ASTM D-4833	700 N
CBR Puncture	ASTM D-6241	3,000 N
Trapezoidal Tear	ASTM D-4533	400 N
Apparent Opening Size	ASTM D-4751	0.150 mm
Permittivity	ASTM D-4491	1.20 Sec^{-1}
Water Flow Rate	ASTM D-4491	3,251 1/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%

1.15 SEDIMENT CONTROL BERMS

.1 Sediment control berms: clear stone as specified in Section 31 23 10.

.2 Geotextile: non-woven, needle-punched polyester filter fabric.

.3 Construct sediment control berms to the cross sections shown, using materials indicated on the Drawings. Locate where and as directed or required.

1.16 MAINTENANCE OF FENCE AND BERM

.1 Maintain siltation control features throughout the construction period. Repair damage to original condition.

.2 Remove accumulated sediment from behind sediment control fence and berms when and as directed by the Airport Representative.

1.17 NON-COMPLIANCE NOTIFICATION

.1 Airport 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 Inform Airport Representative of proposed corrective action in writing within twenty-four (24) hours of receipt of non-compliance notification. .1 Do not take action until after receipt of written approval by Airport Representative.

.3 Airport Representative will issue stop order of Work until satisfactory corrective action has been taken.

.4 No time extensions or equitable adjustments will be allowed to the Contractor for such suspensions.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Due to nature of this Facility, and client operations therein, security regulations pertaining to site will be in place during the work resulting in need for:

.1 Control and limit movement of construction workers at the site.

.2 Escort and continuous supervision of workers by security personnel (Airside Escorts to be provided by the Airport)

.3 Specific rules and regulations as specified in this section and as directed by the Airport Representative to be stringently followed.

.2 It is the Contractor's responsibility to:

.1 Day-to-day activities on site during construction.

.2 Be familiar with and abide by security rules and regulations.

.3 Brief all workers and subcontractors in respect of the security regulations and ensure that they abide by all rules and directives.

.3 The Airport Representative will coordinate a pre-construction meeting between Contractor, Facility Management and Security Personnel who will provide details and directives on control and movement on site.

.4 Any infraction of site security regulations on the part of the Contractor, members of work force or any Subcontractor in his employ, could result in:

.1 Financial penalties in the form of progress payment reduction or holdback assessments being levied against the Contractor.

.2 Immediate removal of offending party from the site.

1.2 CONTRACTOR'S PERSONNEL

.1 Submit an organization chart to the Airport Representative prior to commencing Work on site. Chart to identify and give contact information for the following individuals:

.1 Site Superintendent/Foreman.

.2 QC Manager

.3 Safety Offices

.4 Trade Supervisors

.5 All Subcontractor Managers

1.3 SECURITY PERSONNEL

.1 The airport will provide qualified airport staff to provide escort and security supervision of all workers during the work.

.2 The airport will provide a minimum of two (2) escorts to be on site at all times when work is carried out, having the following responsibilities:

- .1 Limit movement of workers to within the boundaries established by the Airport Representative for each work phase;
- .2 Maintain security control list of workers authorized to be on site as determined by Contractor and the Airport Representative;
- .3 Manage the distribution and control of worker ID tags;
- .4 Escort workers who need to circulate on site beyond the established boundaries of work, including the corridors, stairwells and elevators used for access to and from work areas.
- .5 Escort and supervise short term visitors who need access to the work site such as for material deliveries or to conduct inspections.

.3 The airport will provide additional escorts when required to perform supervision or escort function as may be needed due to Contractor's work operations in order that no worker is left unsupervised on site.

.4 Ensure airport supplied escorts are present on site for entire work shift including work breaks and time period after work shifts until all workers have left site.

.5 Escorts will stay within the actual construction area and provide surveillance of all workers ensuring that security rules and requirements are obeyed and to limit movement to approved work areas of site.

.6 Escorts must also escort workers from approved entrances and work area(s).

.7 Escort and supervision of workers by escorts is required at all times regardless as to whether work shifts are in the daytime or during Facility off hours.

1.4 SECURITY CLEARANCE REQUIREMENTS

.1 Persons do not have security clearance, will not be allowed to circulate freely in restricted areas of site and must be under constant escort and surveillance by security personnel.

- .1 Restricted area defined as: the entire site.

.2 Escort and supervision functions specified herein is required for the project even after workers have obtained security clearance.

1.5 SECURITY PASSES

.1 Visitor or worker ID Tags are required for all personnel requiring access to airside. Airside is the operational area of the airport contained within the security fence perimeter.

.2 ID Tags will be provided by the Facility Security, issued to Contractor for distribution to authorized workers and placed on the Security Control List specified below.

.3 All persons, while on site, must wear the ID Tag issued to him regardless of daytime or nighttime work.

.4 Be responsible to obtain ID Tags before work commences, including those required by subcontractors, and continually control their distribution and use by workers. Submit request for tags as early as possible prior to commencement of work.

.5 For the duration of this contract, anyone not in possession of the ID Tag will not be allowed access on site.

.6 At end of project, return to Airport Representative all tags issued to workers and to subcontractors.

.1 The Airport Representative will levy a financial penalty in the form of a holdback assessment against the Contract for each pass not returned regardless of the reason the pass is not returned.

.7 Immediately report any lost, stolen or destroyed ID Tags to the Airport Representative.

1.6 SECURITY CONTROL LIST

.1 Provide a list of employee names from workforce and from subcontractors who will be present at site during the course of Work.

.2 List to include each person's name, address and telephone number.

.3 Submit copy of list to Airport Representative and to the Airport Escorts for control of workers.

.4 Update list as work progresses.

.5 Verify each worker can provide proof of identity upon demand, when requested by Facility's Security Personnel, Airport Representative or by Facility Management.

1.7 AIRSIDE ACCESS

.1 Gate keys necessary for access to airside areas may be issued at the discretion of the Airport Representative. Follow all instructions in regards to use, care and disposition of keys so issued.

.2 Keys and security access cards given to the Escorts for his sole possession, as determined by Airport Representative, shall not under any circumstances be given to any worker or subcontractor.

.3 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.

.4 At end of project, return to Airport Representative all keys and access cards issued. Airport Representative will deduct from final contract payment, $500.00 for each item not returned, regardless of the reason.

.5 Immediately report to Airport Representative any lost, stolen or destroyed keys.

1.8 SITE SECURITY

.1 When Work must be carried out during off hours or beyond the work hours previously agreed upon at start of work, provide notice within 48 hours beforehand to allow airside security coordination to be arranged for by Airport Representative.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 PURPOSE

.1 To provide information to enable the Contractor to establish and maintain Quality Control through the implementation of a documented Quality Management Plan (QMP) and Commissioning Plan (Cx) incorporating all construction activities of this project.

1.2 DEFINITIONS

.1 Quality Assurance (QA): the planned and systematic activities implemented in a quality system so that quality requirements for a product or service will be fulfilled.

.2 Quality Control (QC): the observation techniques and activities used to fulfill requirements for quality.

1.3 INTRODUCTION

.1 The Contractor is responsible for Quality Control.

.2 The Contractor is responsible for producing quality construction through compliance with plans, specifications, permits and accepted standards of the industry.

.3 The Contractor is responsible for the delivery of Work that meets the standards of quality demanded by the specification as it applies to the materials, workmanship, and completed results. The purpose of the Contractor QMP is to assist in the fulfillment of this obligation and to provide to the Airport Representative a means to confirm the specified level of quality will be achieved.

.4 Strive to obtain a uniform, high quality level of workmanship throughout all phases of procurement, fabrication, construction, installation and commissioning of equipment.

.5 The Airport Representative will carry out Quality Assurance. The Airport Representative's carrying out of Quality Assurance in no way relieves the Contractor of any obligation or liability under the Contract to provide for Quality Control.

1.4 QMP SCOPE

.1 Establish and maintain a QMP as described in this section. This QMP is the key element in establishing the level of quality required under the terms and conditions of this contract and consist of:

- .1 The QC Organization.
- .2 QC Procedures.
- .3 Commissioning Plan.
- .4 Coordination and Mutual Understanding kick off Meeting.
- .5 QC and Cx Meetings.

.6 Three phases of control.

.7 Submittal review and approvals.

.8 Testing.

.9 Inspections and certifications.

.10 Checklists.

.2 The QMP will include but not necessarily be limited to: provision of submittals, shop drawings, samples, testing and/or commissioning of items and/or assemblies indicated in the Commissioning Brief included in Appendix and the various sections of the specifications.

.3 The QMP will cover on-site and off-site work and be keyed to the work sequence.

.4 Acceptance of the QMP is required prior to the start of construction. The Airport Representative reserves the right to require changes in the QMP and operations as necessary.

.5 The only construction Work that is authorized to proceed prior to the acceptance of the QMP is mobilization of storage and office trailers, temporary utilities, and surveying.

.6 Notify the Airport Representative, in writing, of any proposed changes in the QMP or changes to the QC organization personnel, a minimum of ten (10) work days prior to proposed change. Proposed changes are subject to acceptance by the Airport Representative.

.7 The Quality Management Plan (QMP) structure has three (3) phases of control defined as:

.1 QMP Quality Planning

.2 QMP Quality Control

.3 QMP Quality Assurance

.8 Coordination of the three phases of control will be the responsibility of the Contractor's QC Manager (QM).

.9 Commissioning (Cx) is a systematic process of confirming project systems meet the requirements and perform interactively according to the Contract. Cx is a vital element of Quality and must be considered at each stage of construction. The QMP and Cx plans are crucial to this process by coordinating, verifying and documenting measures to achieve the following objectives:

.1 Verify and document that the applicable equipment and systems are installed in accordance with the design intent as expressed through the contract and according to the manufacturer's recommendations and industry accepted standards,

.2 Verify and document that equipment and systems receive complete operational checkout by the installing contractors,

.3 Verify and document proper performance of equipment and systems,

.4 Verify that operation and maintenance (O&M) documentation is complete, and

.5 Verify and document that the operational staff are adequately trained.

.6 Ensure smooth and successful transfer of custody.

1.5 QMP QUALITY PLANNING

.1 Formulate, organize and implement as required, written procedures and instructions to describe how quality assurance approach will be executed.

.2 Conform to all contractual requirements, specifications, schedule, applicable standards and codes.

.3 Maintain an effective shop drawing verification and approval system.

.4 Establish as-built drawing review to ensure that the contract requirements meet the specifications.

.5 Establish a system of inspection reporting that demonstrates and active site inspection routine employing checklists. Compile accurate records of events/results, attach test certificates and other required documentation.

.6 Provide specialized inspection services for independent third party testing of high risk work.

.7 Maintain material ordering procedures and records that verify and confirm the materials purchased meet the specified standards.

.8 Develop a deficiency reporting procedure to identify non-conformances. The procedure must cover a verification process to correct the non-conformances and reactivate the inspection process. All non-conformances are to be identified to the Contractor's Superintendent and Airport Representative, daily.

.9 Establish a system commissioning process to cover the commissioning requirements identified in the commissioning plan.

.10 The QMP is to be submitted to the Airport Representative for review and comments, prior to activation and installation of each component of Work.

.11 QM to prepare and submit reports on the entire QMP progress on a weekly basis. The QMP weekly progress report will cover all aspects of the plan, identify progress for the current week and forecast the following week’s activities. Issue these reports electronically to the Airport Representative and Contactor Superintendent.

1.6 QMP QUALITY CONTROL

.1 Quality Control is that part of the QMP, which focuses on fulfilling the project quality requirements. Control to consist of processes and procedures to ensure quality products and workmanship are realized.

.2 Following the Quality Management Plan prepared and approved for each component of Work, complete and report on the following:

- .1 Verify materials and/or equipment complies with the approved shop drawings, product data and samples.
- .2 Verify that the equipment and labour to perform the work is appropriate and qualified.
- .3 Verify the installation of the work has been prepared in accordance with good workmanship practices, manufacturers' recommendations/instructions and the contract documents.
- .4 Verify all material/equipment pre-checks have been performed by qualified persons.
- .5 Verify any and all connections points have undergone quality control checks by either this installation or by another verification of the connection material/equipment.
- .6 At any time in the process, if a non- conformance occurs, direct the process to stop and activate a deficiency report. Work process can reconvene at the beginning of the QMP, once the non-conformance has been corrected.
- .7 When the QMP report has been completed for each component of work, notarize the report and distribute to the Airport Representative.

.3 Allow the Airport Representative access to the Work. If part of the Work is in preparation at locations other than the construction site, allow access to such Work whenever it is in progress.

.4 Give timely notice requesting QA inspection if the Work is designated for special tests, inspections or approvals by Airport Representative.

.5 If Contractor covers or permits work to be covered that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work at no additional cost to the Contract.

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

.7 The Airport Representative maintains the right, and will typically audit, the performance of the QMP and its documentation and installations, to verify compliance to the Contract Documents.

1.7 QMP QUALITY ASSURANCE

.1 Quality Assurance is that part of the QMP, which focuses on verifying that the project Quality Control requirements and performance criteria have been achieved. Assurance to consist of processes and procedures to ensure quality products and workmanship are realized.

.2 Coordination with the Airport Representative's Quality Assurance process will be the responsibility of the Contractor's QM.

1.8 INDEPENDENT INSPECTION AGENCIES

.1 Arrange and pay for QMP QC Independent Inspection Agencies, as required to perform quality control testing.

.2 Arrange and pay for QMP QC equipment and manpower, as required for executing inspection and testing by Independent Inspection Agencies.

.3 Employment of QMP QC or Airport Representative's QMP QA inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Independent Inspection Agencies at no cost to the Airport Representative. Pay all costs for retesting and re-inspection.

.5 Independent Inspection Agencies required to perform quality control testing include, but are not necessarily limited to the following components of Work:

.1 Grade and volume control.

.2 Soils, turf and hydroseeding.

.3 Asphalt.

.4 Concrete.

.5 Storm sewer system.

.6 Line painting.

.6 The Airport Representative may elect to arrange and pay for Quality Assurance testing over and above the Contractor's QMP QC activities to examine any Work as part of this contract. Allow access to the Work as required to facilitate this testing.

1.9 PROCEDURES

.1 The QM must notify Airport Representative 48 hours in advance of requirement for QMP independent inspection agency tests, in order that attendance arrangements can be made.

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

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 Assist Airport Representative to obtain samples as part of the QMP Quality Assurance process.

1.10 TESTS AND MIX DESIGNS

.1 The QM will furnish QC test results and mix designs to the Airport Representative for review.

.2 Contractor to incur all costs of tests and mix designs required in Contract Documents or those required by law of Place of Work.

.3 All work associated with the sampling, field testing and preparing test cylinders shall be the responsibility of the Contractor. The Contractor shall be responsible for all equipment and materials to perform the work. Sampling, testing and preparing test cylinders shall be done as per CSA A23.1-09/A23.2-09

.4 The Contractor shall be responsible for the delivery of concrete cylinders to a testing laboratory designated by the Department Representative. Within 50km of the site. Field test data shall be supplied to the test laboratory with the concrete cylinders. Where testing deficiencies have been identified, the Contractor shall be provided additional testing of the hardened concrete verifying that the concrete meets the contract requirements within two (2) weeks of the notification of the deficiency.

.5 QA test results shall be made available to the Contractor and concrete supplier.

.6 The Contractor shall conduct all necessary quality control process to ensure that concrete incorporated into the work meets contract requirements. This shall include testing, trial placement and operational plans. QC records shall be made available to the Department Representative.

.7 Hot asphalt mix designs are valid

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 QC ORGANIZATION

.1 QC Manager (QM):

.1 QM will implement and manage the Contractor's QMP. No construction Work or testing may be performed unless the QM is 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.

.2 Commissioning Manager:

.1 Designate a Commissioning Manager (CM) to coordinate the Cx and documentation thereof, who is subordinate to the QM. The CM directs and coordinates Cx activities and submits Cx reports to the Airport Representative to meet the submittal and reporting requirements as defined in Cx plan. The CM coordinates the actions of the QC Specialists, Testing Laboratory Personnel, subcontractors and other inspection and testing personnel required by this Contract.

3.2 QUALITY MANAGEMENT PLAN (QMP)

.1 Provide, for acceptance by the Airport 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:

.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. 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.

.2 The Cx Plan is a subset of the QMP but has elements that take place throughout the entire construction. The Cx Plan is managed by the Contractor's CM and is further described in Section 01 91 00 - Final Testing and Commissioning.

3.3 COORDINATION AND MUTUAL UNDERSTANDING MEETING

.1 Prior to submission of the QMP, the QM will meet with the Airport 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, Cx, 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 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

Airport 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 QMP PROGRESS REPORT

.1 After the start of construction, conduct weekly QMP progress report in conjunction with Airport Representative Construction Progress Meeting. Contractor QM will prepare the minutes of the progress report and provide a copy to the Airport 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 report.

.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 weeks and the documentation required.

.5 Resolve QC and production problems.

.6 Address items that may require revising the QMP.

.7 Review the status of training completion.

.8 Review Cx Plan and Progress.

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 Work. The Quality Control Phase is intended to ensure that the Contractor initiates and executes the Work in accordance with 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 Verify field measurements are as indicated on construction and/or shop drawings before confirming product orders.

.5 Verify appropriate shop drawings and submittals for material and equipment have been submitted and approved for materials 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 Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data.

.11 Discuss specific controls used and construction methods, 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 Review the Cx Plan and confirm preliminary Work items have been completed and documented.

.14 Complete applicable checklists

.3 Quality Control Phase: QM will notify the Airport 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 Review the Cx plan and confirm all preparatory work items have been completed and documented

.6 Witness complete applicable checklists for each DA.

.4 Quality Assurance Phase: QM will verify with the Airport 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 approval laboratory.

.4 Confirm rework items are being corrected.

.5 Confirm manufacturers' representatives have performed necessary inspections if required and perform safety inspections.

.6 Review the Cx plan and ensure all work items, testing, and documentation has been completed.

.7 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 SUBMITTAL REVIEW AND APPROVAL

.1 Procedures for submission, review and approval are detailed throughout this section of this specification.

3.7 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 Airport 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 Airport Representative immediately.

.1 Conspicuously stamp the cover sheet for each report in large red letters.

.2 Provide Airport Representative proposed remedial action plan to correct failure instance within 24 hours.

.5 The specific QC testing requirements are as follows:

.1 The Contractor is to submit samples of the proposed aggregate source(s) to their QC testing laboratory to test for conformance with the applicable specification. QC test results shall be provided to the airport representative as soon as they become available.

.2 The Contractor is to submit aggregate source samples to the Airport Representative's QA laboratory for testing. The samples shall be of sufficient size to complete all applicable tests. The laboratory address is as follows:

Stantec Consulting Ltd.

130 Somerset Street

Saint John, NB E2K 2X4

.1 Acceptance of the proposed aggregate source(s) shall be based on approval of the Airport Representative following review of the QC and QA test results.

.3 The Contractor shall have an independent CCiL certified laboratory carry out an asphalt mix design and stripping test.

.1 Acceptance of the Contractor's asphalt mix design shall be based on approval of the Airport Representative following review of the Contractor's submission.

.4 The Contractor shall provide a site laboratory properly equipped for QC testing. Laboratory staff shall be CCiL certified technicians.

.1 The QC site testing laboratory and equipment shall be available at all times for the Airport Representative's QA staff to review equipment and observe testing.

.5 Minimum QC sampling and testing frequencies are as follows:

Test	**Min. Frequency**
Proctors	2 per material
Gradation during aggregate crushing	2 per day
Crushed particles during aggregate crushing	2 per day

Test	Min. Frequency
Compaction of granular	1 test per 200m^2
Depth of pulverization	1 location per 500m^2
Compaction of pulverized granular	1 test per 200m^2
Asphalt concrete during paving	2 per day
Asphalt compaction (nuclear gauge)	1 test per 200m^2
Asphalt compaction (coring)	1 test per 1500m^2
Pavement straightedge	1 test per 200m^2

.6 QM will furnish the signed QC reports and certifications of field tests at the end of each work day to the Airport Representative. Attach a copy of the summary report summarizing submissions to the weekly Contractor QMP report.

.7 QM is required to complete tests prior to demonstration of the electrical functional tests in presence of the CA. Advise the Airport Representative of the timing of these tests.

3.8 TRAINING

.1 Prior to acceptance of the facility by the Airport Representative, the CM must provide a comprehensive project-specific operational personnel training program for the systems and equipment of the facility specified in the technical specifications of this Contract. The trainees must include the Airport Representative and respective designated personnel. The Contractor is responsible for coordinating, scheduling, and ensuring that training is completed. Instructors must be well-versed in the particular system that they are presenting. Provide instruction time on site at a location approved by the Airport Representative.

.2 CM will submit a written training plan to the Airport Representative for review and approval prior to training. Coordinate and schedule the training with the Airport Representative. Include within the plan the following elements:

- .1 Equipment included in training.
- .2 Intended audience.
- .3 Location of training.
- .4 Objectives.
- .5 Subjects covered including description.
- .6 Duration of training on each subject.
- .7 Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
- .8 Instructor and instructor qualifications for each subject

.3 Training content must stress and enhance the importance of system interactions, troubleshooting, and long-term preventative

maintenance and operation. The core of this training will be based on manufacturer's recommendations and the operation and maintenance information provided as a part of this Contract. A review of environmentally-related aspects of the Operation and Maintenance Manuals will be included. Include the following for each commissioned system:

.1 Design intent.

.2 Use of O&M Manuals.

.3 Review of control drawings and schematics.

.4 Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms as applicable.

.5 Interactions with other systems.

.6 Adjustments and optimizing methods for energy conservation.

.7 Relevant health and safety issues.

.8 Special maintenance and replacement sources.

.9 Discussion of how the feature or system is environmentally responsive

.4 The Airport Representative will provide a list to the QM and CM, a list of all personnel who will be attending these formal training sessions.

.5 The CM is responsible for overseeing and approving the content and adequacy of the training. The CM must interview the facilities manager and Airport Representative to determine the special needs and areas where training will be most valuable. The Airport Representative and CM must decide how rigorous the training should be for each piece of equipment. The CM is to communicate the results to the QM, who will provide each trainee in the course a written course outline, listing the major and minor topics to be discussed by the instructor on each day of the course.

.6 If, at the end of the training course, there are questions from trainees that remain unresolved, the instructor will send the answers, in writing, to the Airport Representative for transmittal to the trainees, and the training package, as applicable, should be modified to include the appropriate clarifications.

.7 CM will develop criteria for determining that the training was satisfactory completed, including attending some of the training, and upon fulfillment of the criteria, validate training completion. The CM will recommend approval of the training to the Airport Representative using a standard form and the CM and Airport Representative will sign the approval form. Provide completed and signed validation of training forms as provided in the QMP for all training sessions accomplished. Provide two (2) copies of the signed training validation forms to the Airport Representative.

3.9 DOCUMENTATION

.1 QM will maintain current and complete records of on-site and off-site QMP operations and activities.

.2 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 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 Airport Representative during all business hours and contain:

.1 All completed Quality Planning, Control and Assurance Phase Checklists, arranged by specification section.

.2 All milestone inspections, arranged by 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.

.6 Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and

.7 Sub-Contractors and all punch lists issued by the Airport Representative.

.8 Commissioning documentation including Cx checklists, schedules, test, and reports.

.9 Training documentation indicating training subject, applicable specification section and personnel trained.

.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 the CM and the QM will report and record on their results.

.6 QM must maintain a list of Work that does not comply with the Contract, identifying what items need to be reworked, the date 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 a copy of the list to the weekly QMP Report.

.7 QM is required to confirm that as-built drawings are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. Confirm each deviation has been identified with the appropriate modifying documentation (e.g. Change Order Number, Request for Information Number, etc.) Submit total station interim survey records in accordance with Section 01 10 00. QM or QC Specialties assigned to an area of responsibility must initial each revision. Upon Completion of Work, QM will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Airport Representative.

END OF SECTION

PART 1 - GENERAL

1.1 SITE ACCESS AND PARKING

.1 The Airport Representative will designate the Contractor's access to project site and circulation routes, as well as parking facilities for equipment and workers.

.2 Build and maintain temporary access roads and provide snow removal and dust control during period of work.

.3 Maintain roads and parking areas at site, where used by Contractor, for duration of contract.

.1 Keep clean and free of mud and dirt by washing on a regular basis.

.2 Provide snow removal in areas located within construction site or enclosed by work.

.3 Make good and repair damage resulting from Contractor's use of existing roads, asphalted areas and lawns on site.

1.2 CONTRACTOR'S SITE OFFICE

.1 Be responsible for and provide own site office, including electricity, heat, lights and telephone. Locate site office as directed by Airport Representative.

1.3 AIRPORT REPRESENTATIVE SITE OFFICE

.1 To be provided by the Airport.

1.4 MATERIAL STORAGE

.1 Locate site storage trailers where directed by Airport Representative. Place in location of least interference to operations.

.2 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.

1.5 SANITARY FACILITIES

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

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

.3 Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Airport Representative.

1.6 POWER

.1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.2 Supply and install all temporary facilities for power such as pole lines, metre socket, underground cables, etc. as required and to approval of local power supply authority.

.3 Source for power supply is located in area of Combined Services Building and will be provided for construction usage at no cost.

.1 Make arrangements for the use of such services through the Airport Representative.

.2 Airport Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.

.3 Connect to existing power supply in accordance with Canadian Electrical Code.

.4 Provide and pay all costs to supply and install temporary cabling, panelboards, switching devices and other equipment as required to connect into power source, provide adequate ground fault protection and extend power supply from existing source to work areas. Perform work and make all connections in accordance with the Canadian Electrical Code, in compliance with the federal and provincial Occupational Health and Safety Regulations as specified in section 01 35 29.

.5 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162 lx in all location.

1.7 WATER SUPPLY

.1 Provide for own water source.

.2 Provide transportation and distribution of water to construction site at no additional cost to the Contract.

1.8 CONSTRUCTION SIGN AND NOTICES

.1 Erect a self-supporting project sign in location indicated.

.2 Airport Representative will provide a vinyl sign facing for installation by Contractor on sign framework. Sign frame to be plywood face of approximately 1200 x 2400 mm in size complete with required wood framing at 400 mm o.c and support posts.

.3 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.

.4 Contractor or subcontractor advertisement signboards are not permitted on site.

.5 Safety and Instruction Signs and Notices:

.1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN3-Z321.

.6 Maintenance and Disposal of Site Signs:

.1 Maintain approved signs and notices in good condition for duration of project and dispose of offsite on completion of project or earlier if directed by Airport Representative.

1.9 FIRE ROUTES

.1 Maintain access at all times including overhead clearances for use by emergency response vehicles.

1.10 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by Airport Representative.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Use new material and equipment unless otherwise specified.

.2 Within seven (7) days of written request by Airport Representative, submit following information for any materials and products proposed for supply:

- .1 Name and address of manufacturer.
- .2 Trade name, model and catalogue number.
- .3 Performance, descriptive and test data.
- .4 Compliance to specified standards.
- .5 Manufacturer's installation or application instructions.
- .6 Evidence of arrangements to procure.
- .7 Evidence of manufacturer delivery problems or unforeseen delays.

.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.

.4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

.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.

1.2 PRODUCT QUALITY

.1 The Contractor is solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.

.2 Final decision as to whether a product or system meets contract requirements rest solely with the Airport Representative in accordance with the General Conditions of the Contract.

1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES

.1 Acceptable Materials: When materials specified include trade names or trademarks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.

.2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.

.3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

1.4 MANUFACTURERS INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Airport Representative in writing of any conflict between these specifications and manufacturer's instructions, so that Airport Representative will designate which document is to be followed.

1.5 AVAILABILITY

.1 Immediately notify Airport Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2 above.

1.6 WORKMANSHIP

.1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

.2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.

.3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.

.4 Coordinate work between trades and subcontractors.

.5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS GENERAL

.1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non- corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.

.2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.

.3 Keep exposed fastenings to minimum, space evenly and lay out neatly.

.4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.

.5 Do not use explosive actuated fastening devices unless approved by Airport Representative. See section on Health and Safety Requirements in this regard.

1.8 FASTENINGS EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

1.9 STORAGE, HANDLING AND PROTECTION

.1 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.

.2 Store products subject to damage from weather in weatherproof enclosures.

.3 Store cementitious products clear of earth or concrete floors, and away from walls.

.4 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.5 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.6 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.7 Immediately remove damaged or rejected materials from site.

.8 Touch-up damaged factory finished surfaces to Airport Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Ontario, acceptable to Airport Representative.

1.2 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Airport Representative.

.4 Report to Airport Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.3 SURVEY REQUIREMENTS

.1 Establish one (1) permanent bench mark on site, referenced to established bench marks by survey control points. Record location, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake asphalt and granular base placement.

.5 Stake slopes and berms.

.6 Establish pipe invert elevations.

.7 Establish lines and levels for electrical work.

1.4 EXISTING SERVICES

.1 Before commencing Work, establish location and extent of service lines in area of Work and notify Airport Representative of findings.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut off points as directed by Airport Representative.

1.5 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered approximate.

.2 Locate equipment, fixtures and distribution to provide minimum interference and maximum space and in accordance with manufacturer's systems usable recommendations for safety, access and maintenance.

.3 Inform Airport Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Airport Representative.

1.6 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.7 SUBMITTALS

.1 Submit name and address of Surveyor to Airport Representative.

.2 On request of Airport Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.8 SUBSURFACE CONDITIONS

.1 Promptly notify Airport Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Airport Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in General Conditions.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Bulk storage of volatile materials within airside perimeter fence is not permitted.

.3 Store volatile waste in covered metal containers, and remove from the site at end of each working day.

.4 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

1.2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.2 Provide list of materials to be used for cleaning and submit MSDS sheets for each item used. Cleaning materials to be approved by the Airport Representative before using.

1.3 FOD CONTROL

.1 Remove FOD immediately.

1.4 CLEANING DURING CONSTRUCTION

.1 Maintain work site in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.

.2 Provide on-site containers at approved locations for collection of waste materials and debris.

.3 Use separate collection bins at approved locations, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified.

.4 Remove waste materials, and debris from site on a daily basis.

.5 Schedule cleaning operations so that resulting dust, debris and other contaminants do not impact construction or airside operations.

.6 Remove snow and ice to allow for construction.

1.5 FINAL CLEANING

.1 In preparation for acceptance of the completed work perform final cleaning.

.2 Clean airfield lighting fixtures.

.3 Mechanically sweep and wash paved surfaces; rake clean other surfaces of grounds.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

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

1.2 WASTE MANAGEMENT

.1 Incorporate environmental and sustainable practices in managing waste resulting from work.

.2 Divert as much waste as possible from landfill.

.3 Coordinate work of sub trades and subcontractors to ensure all possible waste reduction and recycling opportunities are taken. Follow waste management requirements specified in trade sections of the Specifications.

.4 Reduce waste during installation of new materials. Undertake practices which will optimize full use of materials and minimize waste.

.5 Develop innovative procedures to reduce quantity of waste generated by construction such as by delivering materials to site with minimal packaging etc.

.6 Provide on-site facilities at approved location to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.

.7 During demolition and removal work separate materials for the following purposes:

.1 Salvaging reusable items not needed in project which Contractor may sell to other parties.

.2 Sending as many items as possible to locally available recycling facility.

.3 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.

.8 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.

.9 Send leftover material resulting from installation work for recycling whenever possible.

.10 Establish methods whereby hazardous and toxic materials, and their containers used on site are properly handled, stored and disposed in accordance with applicable federal, provincial and municipal lase and regulations.

1.3 DISPOSAL REQUIREMENTS

.1 Burying or burning of rubbish and waste material is prohibited.

.2 Disposal of volatile materials, mineral spirits, oil, paint, and other hazardous materials into waterways, storm, or sanitary sewers is prohibited.

.3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.

.4 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.

.5 Transport and dispose of waste intended for waste processing plant or landfill facility in separated condition and to Operator's rules and recommendations in support of their effort to recycle, reduce and divert certain waste stream from general landfill.

.6 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.

.7 Sale of salvaged items by Contractor to other parties not permitted on site.

1.4 ACCESS MATERIAL

.1 Any access material will remain onsite and will become the property of the municipality.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Administrative procedures preceding inspection and acceptance of Work by Airport Representative.

1.2 RELATED SECTIONS

.1 Section 01 78 00 - Closeout Submittals.

1.3 INSPECTION AND DECLARATION

.1 Contractor’s Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.

.1 Notify Airport Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Airport Representative's inspection of the completed work.

.2 Airport Representative's Inspection: Accompany Airport Representative during all substantial and final inspections of the Work.

.1 Address defects, faults and outstanding items of work identified by such inspections.

.2 Advise Airport Representative when all deficiencies identified have been rectified.

.3 Note that Airport Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:

.1 Project record as-built documents.

.2 Final Operations and Maintenance manuals.

.3 Maintenance materials, parts and tools.

.4 Compliance certificates from applicable authorities.

.5 Reports resulting from designated tests.

.6 Manufacturer's Guarantee certificates.

.4 Correct all discrepancies before Airport Representative will issue the Certificate of Completion.

1.4 FACILITY OCCUPANCY

.1 Airport Representative will have the right to take possession of and use any completed or partially completed portion of the Work regardless of time of completion of entire work, providing it does not interfere with the Contractor's work. Such taking possession or use of all, or part of the works thereof, will not be construed as final acceptance of the Work, or any portion thereof, or an acknowledgement of fulfillment of the terms of the Contract.

1.5 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary offices, storage sheds, fencing, barricades, and any other temporary facilities from site.

.2 Clean up and restore proper finish grade to all areas which have been used for stockpiling materials and/or waste, for temporary buildings or facilities, for temporary roads and traffic areas or on which the final grade has been disturbed or damaged by any cause.

1.6 FINAL CLEANING

.1 Complete final cleaning as specified in Section 01 74 11.

1.7 COMPLETION CERTIFICATES

.1 Refer to General Terms and Conditions for procedures regarding the issuance of completion certificates.

1.8 GUARANTEE PERIOD

.1 Upon written notice during the guarantee period immediately replace, repair, or otherwise make good all defective work, materials, or equipment at no additional cost to Airport Representative. Note that the guarantee period extends until twelve (12) months after the official acceptance date for the entire project (Final Certificate of Completion), and/or longer periods as provided in accordance with the Specifications.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Project Record Documents.

.2 Operations and Maintenance data.

1.2 PROJECT RECORD DOCUMENTS

.1 Airport Representative will provide two (2) white print sets of contract drawings specifically for "as-built" purposes.

.2 Maintain at site one set of the contract drawings to record actual as-built site conditions.

.3 Maintain up to date, real time as-built drawings in good condition and make available for inspection by the Airport Representative upon request.

.4 As-Built Drawings:

.1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).

.2 Submit both sets to Airport Representative prior to application for Certificate of Substantial Performance.

.3 Stamp all drawings with "As-Built Drawings". Label and place Contractor's signature and date.

.4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.

.5 Record following information:

.1 Horizontal and vertical location of exterior underground utilities and appurtenances referenced to permanent surface improvements.

.2 Horizontal and vertical location of various elements in relation to Geodetic Datum;

.3 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;

.4 Field changes of dimension and detail;

.5 Location of all capped or terminated services and utilities.

.6 Electrical and other services;

.7 Any details produced in the course of the contract by the Airport Representative to supplement or to change existing design drawings;

.8 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.

.5 As-built Specifications: legibly mark in red each item to record actual construction, including:

.1 Changes made by Addenda and Change Orders.

.2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.

.6 Maintain As-built documents current as the contract progresses. Airport Representative will conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-builts current and complete to satisfaction of the Airport Representative will be subject to financial penalties in the form of progress payment reductions and holdback assessments.

1.3 REVIEWED SHOP DRAINGS

.1 Provide a complete set of all shop drawings reviewed for project to incorporate into each copy of the Operations & Maintenance manuals.

.2 Submit full sets at same time and as part of the contents of the Operation and Maintenance manuals specified.

1.4 UPDATING OF DIGITAL DRAWINGS

.1 Obtain and pay for the services of a qualified drafting firm to update the digital files which were used to produce the contract drawings.

.1 Update the digital drawing files with the same as-built information as specified for the paper as-built drawings.

.2 Supply of digital documents does not replace the requirement to provide marked-up white prints specified above.

.2 The Airport Representative will provide a copy of the digital drawing files which were prepared in AutoCAD - latest release.

.3 Incorporate the as-built changes to the digital drawings by following the standards specified in the latest version of the PWGSC Atlantic Region CADD Data Specification manual. A copy of this manual will be provided by the Airport Representative.

.4 Make revisions to electronic filesfound to be in non-conformance with the CADD Data Specifications Manual as directed by Airport Representative.

.5 In regards to updating the digital files to reflect changes resulting from Change Orders, the change in cost of completing the As-Built documentation of changes is to be included in the amount for each Change Order issued. The amount included will constitute only the increase or decrease in CADD related costs resulting directly from the change. In determining the cost difference, full consideration will be given to the fact that other clauses of this section require As-Built CADD updates to the drawings irrespective of any Change Orders.

.6 Deliver the digital as-built information in same format and sequence as the contract drawings.

.1 Submit on CD diskettes.

.2 Provide one (1) full set of paper plots.

.3 Submit the digital as-builts at the same time as the marked-up paper white prints.

1.5 OPERATIONS & MAINTENANCE MANUAL

.1 O&M Manual - Definition: an organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual products or systems as specified in individual sections of the specifications.

.2 Manual Language: final manuals to be in English languages.

.3 Number of copies required:

.1 Submit two (2) interim copies of the manual for review and inspection by Airport Representative. Make revisions and additions as directed and resubmit.

.2 Upon review and acceptance by Airport Representative, submit three (3) final copies. Interim copies are not to be considered as part of the final copies unless they have been fully revised and are identical to the final approved version.

.4 Submission Date: submit complete operation and maintenance manual to Airport Representative three (3) weeks prior to application for Certificate of Substantial Performance of the work.

.5 Binding:

.1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual.

.2 Use vinyl, hard covered, three (3) "D" ring binders, loose leaf, sized for 215 x 280 mm paper, with spine pocket.

.3 Where multiple binders are needed, correlate data into related consistent groupings.

.4 Identify contents of each binder on spine.

.5 Organize and divide data following same numerical system as the section numbers of the Specification Manual.

.6 Dividers: separate each section by use of cardboard dividers and labels. Provide tabbed fly leaf for each individual product and system and give description of product or component.

.7 Type lists and notes. Do not hand write.

.8 Drawings, diagrams and manufacturers' literature must be legible. Provide with reinforced, punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.6 Manual Contents:

.1 Cover sheet containing:

.1 Date submitted.

.2 Project title, location and project number.

.3 Names and addresses of Contractor, and all Sub-contractors.

.2 Table of Contents: provide full table of contents in each binder(s), clearly indicate which contents are in each binder.

.3 List of maintenance materials.

.4 List of spare parts.

.5 List of special tools.

.6 Original or certified copy of warranties and product guarantees.

.7 Copy of approval documents and certificates issued by Inspection Authorities.

.8 Copy of reports and test results performed by Contractor as specified.

.9 Product Information (PI Data) on materials, equipment and systems as specified in various sections of the specifications. Data to include:

.1 List of equipment including manufacturer's name, supplier, local source of supplies and service depot(s). Provide full addresses and telephone numbers.

.2 Nameplate information including equipment number, make, size, capacity, model number and serial number.

.3 Parts list.

.4 Installation details.

.5 Operating instructions.

.6 Maintenance instructions for equipment.

.7 Maintenance instructions for finishes.

.7 Shop drawings:

.1 Include complete set of reviewed shop drawings into each copy of the operations and maintenance manual.

.2 Fold and bind material professionally in a manner that corresponds with the specification section numbering system.

.3 When large quantity of data is submitted, place into separate binders of same size as O&M binders.

1.6 SPARE PARTS, TOOLS AND MAINTENANCE

.1 Provide spare parts, special tools and extra materials for maintenance purposes in quantities specified in individual specification sections.

.2 Tag all items with associated function or equipment.

.3 Provide items of same manufacturer and quality as items in Work.

.4 Deliver to site in well packaged condition. Store in location as directed by Airport Representative.

.5 Clearly mark as to contents indicating:

.1 Part number.

.2 Identification of equipment or system for which parts are applicable.

.3 Installation instructions or intended use as applicable.

.4 Name, address and telephone number of nearest supplier.

.5 Prepare and submit complete inventory list of items supplied. Include list within Maintenance Manual.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This section specifies the requirements for demolishing a number of items including, but not necessarily limited to: removal of existing airfield runway and taxiway surfaces where indicated on the drawings or in the specifications. This section specifies the requirements for demolishing a number of items including, but not necessarily limited to: manhole and catch basin tops, storm sewer lines and related appurtenances, removal of existing airfield taxiway and apron surfaces and airfield

.2 Unless otherwise specified or directed, all materials encountered, demolished, excavated, removed, etc. on this project and which are not designated for reinstatement, Owner salvage or reuse, are to be immediately removed and disposed of off Airport property at a location arranged and paid for by the Contractor and in accordance with OPSS 180 and applicable environmental laws and regulations.

1.2 REFERENCES

.1 Meet or exceed the requirements of all provincial environmental legislations and regulations including all amendments up to the project date, provided that in any case of conflict or discrepancy, the more stringent requirements will apply.

1.3 RELATED WORK

.1 Excavation, Trenching and Backfilling: Section 31 23 10.

1.4 EXISTING CONDITIONS

.1 Items scheduled for demolition and/or removal are to be based on their condition on date that tender is accepted.

1.5 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures and services. Provide bracing, shoring as required. Repair damage caused by demolition as directed by Airport Representative.

.2 Confirm that demolition work does not adversely affect adjacent infrastructure, watercourses, groundwater, or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury waste or materials on site.

.5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition Work.

.6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control FOD and dust on all airfield operational surfaces.

.7 Protect plants and foliage on site.

1.6 REGULATORY REQUIREMENTS

.1 Perform work in compliance with applicable Federal, Provincial and Municipal Regulations.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site with Airport Representative and verify extent and location of items designated for removal, disposal, salvage, relocation and items to remain.

.2 Airport Representative will create a Record of Existing Conditions.

.3 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

3.2 SAFETY CODE

.1 Observe construction safety measures of Provincial Government, including but not limited to the Occupational Health and Safety Act; Workers' Compensation Board and Municipal authority provided that in any case of conflict or discrepancy the more stringent requirement shall apply.

.2 Store volatile waste in closed containers and remove from premises daily.

.3 WHMIS:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.4 Exercise pollution and environmental control activities as specified and as required during the Work.

.5 Submit to Airport Representative prior to commencement of Work, printed information detailing means and methods so the following will be carried out:

.1 To ensure that health and safety of persons at or near the Work.

.2 To ensure the measures and procedures of the regulatory agencies specified are carried out.

.3 To ensure every employee, self-employed person and employer performing Work under this Contract complies with the regulatory agencies specified.

3.3 MISCELLANEOUS CONCRETE CONSTRUCTION

.1 Demolish abandoned concrete construction as shown on the drawings.

.2 No concrete, masonry or reinforcing steel demolished from the site can be used as backfill on the site.

.3 Limit length of trenches to lengths that can be backfilled by end of work shift.

.4 At end of each day's Work, leave Work in a safe and stable condition.

.5 Only stockpile demolition debris at location permitted by the Airport Representative.

.6 Complete demolition in a manner to minimize FOD and dust. Keep materials wetted as directed by the Airport Representative.

.7 Dispose of materials at a site approved by the Airport Representative and in conformance with the Provincial Environment and Conservation's Guidelines. Pay all costs and fees associated with the disposal.

3.4 ASPHALT PAVEMENT

.1 Saw cut to lines indicated.

.2 Remove existing asphalt pavement where indicated.

.3 Dispose of asphalt off-site in accordance with the Newfoundland and Labrador Department of Environment and Conservation Guidance document titled "Guidelines for Waste Asphalt Use in New Pavement or in Roadbed Construction of Paved Roads; and or Storage and Final Disposal".

3.5 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas or as indicated on drawings.

3.6 CLEANUP

.1 Upon completion of Work, remove debris, trim surfaces and leave work site clean.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies the definition for the correction to maximum dry density to take into account aggregate particles larger than 4.75mm.

1.2 RELATED SECTIONS

.1 Rough Grading: Section 31 22 13.

.2 Subgrade Reshaping: Section 31 22 16.

.3 Excavating, Trenching and Backfilling: Section 31 23 10.

.4 Granular Base Materials: Section 32 11 16.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM), most recent edition

.1 ASTM C127, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.

.2 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

.3 ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.4 DEFINITIONS

.1 Corrected maximum dry density is defined as:

.1 D = (D1xD2) / ((F1 x D2) + (F2 x D1))

.2 Where: D = corrected maximum dry density kg/m3.

.1 F1 = fraction (decimal) of total field sample passing 4.75mm sieve

.2 F2 = fraction (decimal) of total field sample retained on 4.75mm sieve (equal to 1.00 - F1)

.3 D1 = maximum dry density, kg/m3 of material passing 4.75mm sieve determined in accordance with Method A of ASTM D1557.

.4 D2 = bulk density, kg/m3, of material retained on 4.75mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.

.3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 wet method when directed by Airport Representative.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 NOT APPLICABLE

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies requirements for grading, testing and the removal of surplus material.

1.2 RELATED SECTIONS

.1 Environmental Procedures: Section 01 35 43.

.2 Demolition, Removals and Relocations: Section 02 41 00.

.3 Airfield Pavement Base Reshaping: Section 31 22 16.

.4 Excavation, Trenching and Backfilling: Section 31 23 10.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D1557-2012, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3/2,700 kN-m/m3).

1.4 EXISTING CONDITIONS

.1 A Geotechnical Report has been carried out for the Site. Stantec Geotechnical Pavement Investigation Report, Moosonee Airport, ON, dated May 11, 2015 is available for viewing upon request at the office of the Airport Representative.

.2 Known underground and surface utility lines and buried objects are as indicated on site plan.

.3 Contractor to verify location of underground utilities in conjunction with carrying out the Work.

.4 Refer to dewatering in Section 31 23 10.

1.5 PROTECTION

.1 Protect existing infrastructure, landscaping, natural features, bench marks, and water courses which are to remain as indicated and as directed by Airport Representative. If damaged, restore to original or better condition unless directed otherwise.

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

PART 1 - PRODUCTS

1.1 MATERIALS

.1 Excavated or graded material existing on site may be suitable to use as common fill for grading work if approved by Airport

Representative. Airport Representative does not guarantee approval of on-site excavated materials for re-use.

.2 Common fill material: in accordance with Section 31 23 10.

.3 Borrow material: in accordance with Section 31 23 10.

PART 2 - EXECUTION

2.1 ENVIRONMENTAL PROTECTION

.1 Perform Work in accordance with Section 01 35 43 and approved Environmental Protection Plan.

2.2 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:

.1 Refer to Section 31 22 16 for asphalt paving and associated shoulder areas.

.3 Compact filled and disturbed areas to corrected maximum dry density to ASTM D1557, as follows:

.1 97% under concrete assemblies.

.2 Refer to Section 31 22 16 for asphalt paving and associated shoulder areas.

.4 Fill lifts not to exceed compacted thickness of:

.1 200 mm under concrete assemblies.

.2 200 mm under gravel paved areas.

.3 200 mm under asphalt paved areas.

.4 300 mm under other areas.

.5 Refer to Section 31 23 16 for testing frequencies of reshaped base materials.

2.3 SUBGRADE RESHAPING

.1 Coordinate rough grading with subgrade reshaping as indicated in Section 31 22 16.

2.4 TESTING

.1 Submit testing procedure, frequency of tests, testing laboratory as designated by ULC or certified testing personnel to Airport Representative for approval. Refer to Section 01 45 00.

2.5 SURPLUS MATERIAL

.1 Remove clean surplus material and material unsuitable for fill, grading or landscaping off site.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section specifies requirements for furnishing all materials, labor, tools and equipment and performing all operations necessary to excavate all types of material encountered, placing of excavated material as backfill, disposal of unsuitable and surplus material and furnishing backfill material as specified below, all as shown on the Drawings and as specified in this Section.

.2 The Work generally includes, but is not necessarily limited to the following items:

- .1 Trench excavation and backfilling for future utility duct crossings.
- .2 Supplying and placing pipe foundation material where required.
- .3 Control of water by dewatering.
- .4 Excavating and placing common material.
- .5 Providing borrow material.
- .6 Stockpiling or disposal of surplus material.
- .7 Removal and disposal of unsuitable material.
- .8 Sheeting, shoring and bracing to support trench walls, sides of excavations and existing structures or utilities and embankments.

1.2 RELATED WORK

.1 Rough Grading: Section 31 22 13.

.2 Airfield Pavement Base Reshaping: Section 31 22 16.

.3 Granular Base Materials: Section 32 11 16.

1.3 REFERENCES

.1 CAN/CGSB 148.1-2003 COMPLETE SET, Methods of Testing Geotextiles and Geomembranes

.2 ASTM D1557, Standard Test Methods for. Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3(2,700 kN-m/m3)).

.3 ASTM D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

.4 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods

1.4 SUBMITTALS

.1 Submit samples, indicating source, material characteristics and sieve analysis in accordance with Section 01 33 00 for items listed:

- .1 Granular filter material.
- .2 Clear stone, 28 mm.
- .3 Clear stone, 80 mm.
- .4 Rock liner.
- .5 Type A granular material.
- .6 Type B granular material.

1.5 PROTECTION OF EXISTING FEATURES

.1 Existing buried airfield utilities and structures:

- .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
- .2 Prior to commencing excavation work, notify Airport Representative, establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during Work.
- .3 Confirm locations of buried utilities by careful test excavations.
- .4 Maintain and protect from damage utilities and structures encountered.
- .5 Where utility lines or structures exist in area of excavation, obtain direction of Airport Representative before removing or re-routing. Advise Airport Representative of existing lines in area of excavation that require removal or relocation and cost for such work.
- .6 Record location of maintained, re-routed and abandoned underground lines.

.2 Existing surface features:

- .1 Conduct, with Airport Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, lights, 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 repairs to the approval of Airport Representative.

1.6 SHORING, BRACING AND UNDERPINNING

.1 Protect existing features in accordance with Section01 35 43, applicable federal and local regulations and with authorities having jurisdiction.

.2 Engage services of qualified professional engineer who is registered or licensed in Province of Ontario in which Work is to be carried out to design and inspect sheeting, shoring, bracing and underpinning required for Work.

.3 Submit design and supporting data at least three (3) weeks prior to commencing Work to Airport Representative or record.

.4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario.

1.7 SUPPORT OF EXCAVATION

.1 Suitably slope or properly shore sides of excavations according to site conditions, all in accordance with the Provincial Occupational Health and Safety Act.

.2 The choice of any method of support will be the responsibility of the Contractor. However, drawings and calculations for the method of support selected, designed by a qualified professional engineer in accordance with the Provincial safety requirements, are to be submitted to Airport Representative for review before its use.

.3 If it is desirable that any support, other than that which may be shown on the Drawings, be left in the excavations, then Airport Representative will issue instructions accordingly.

.4 Take every precaution against slips or falls, but if any should occur, at once make good the same. If any such slip or fall affects or may affect the stability of the permanent Work, execute such remedial work as necessary, including filling up of any space left by the slip or fall with approved granular material. Submit proposed remedial Work to Airport Representative for review.

PART 1 - PRODUCTS

1.1 MATERIALS

.1 Select Backfill material: common fill material approved from site excavation or borrow pits. Such material to be free from stumps, trees, roots, sod, muck, organics or other deleterious material. Material to be well graded having a maximum particle size not exceeding 200 mm with 40% to 60% of the material retained on 75 mm sieve. Material must not be frost susceptible. The material must be free from frost, and not be placed on frozen ground or in water. It must have a moisture content that will allow compaction to the specified densities. Fines content maximum 15% (passing 75 micron).

.2 Structural fill: composed of crushed pit or beach gravel, or crushed rock, well graded, sound, durable, granular material, free from clay, frozen lumps, organic, or deleterious matter, graded as follows:

Sieve Size (mm)	Cum. % Passing
112	100
80	95-100
20	20-90
5	20-70
0.080	0-10

.3 Granular Filter Material:

.1 Crushed gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C136.

.3 The filter material will satisfy the following criteria:

.1 D15 (of filter material) ÷ D85 (of Type A) will be less than or equal to 5

.2 D50 (of filter material) ÷ D50 (of Type A) will be less than or equal to 25

.3 D60 (of filter material) ÷ D10 (of filter material) will be less than or equal to 20 to ensure adequate Permeability

.4 D15 (of filter material) ÷ D15 (of Type A) will be greater than 4 where Dx is the particle size diameter where x% of the particles of the material is finer

.4 Clear stone: crushed and screened, hard, durable stone, free from clay and organic matter, and graded as follows:

.1 Clear Stone, 28 mm:

Sieve Size (mm)	Cum. % Passing
28	100
20	90-100
10	0-40
5	0-10

.2 Clear Stone, 80 mm:

Sieve Size (mm)	Cum. % Passing
80	100
56	25-60
28	0-5

.5 Granular bedding materials: well graded, granular material conforming to aggregate matching Type A granular base material gradation specification as indicated in Section 32 11 16.

.6 Sand bedding materials: hard granular, well-graded from coarse to fine, free of impurities, chemicals and organic matter and graded as follows:

Sieve Size (mm)	Cum. % Passing
6.350	100
4.760	70-95
2.000	50-80
0.420	5-25
0.075	0-6

.7 Rock liner: hard, durable, dense cuboid igneous quarry stone, free from cracks, seams or other structural defects. Resistant to water and ice attack.

.1 200 Nominal:

Sieve Size (mm)	Cum. % Passing
200	100
150	90-100
112	20-35
80	0-20
20	0-10

.8 Granular base & subbase materials for pavements: to Section 32 11 16.

.9 Geotextile: non-woven, needle-punched synthetic filter fabric composed of minimum 85% by mass of polyester with inhibitors to resist deterioration as follows:

Property	Test Method	Metric
Weight	ASTM D-5261	400 g/sm
Tensile Strength	ASTM D-4632	1,400 N
Elongation @ Break	ASTM D-4632	50 %
Thickness	ASTM D-5199	3.05 mm
CBR Puncture	ASTM D-6241	4,000 N
Trapezoidal Tear	ASTM D-4533	500 N
Apparent Opening Size	ASTM D-4751	0.150 mm
Permittivity	ASTM D-4491	0.9 Sec^{-1}
Permeability	ASTM D-4491	0.30 cm/sec
Water Flow Rate	ASTM D-4491	2,500 1/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%

.10 Underground warning tape:

.1 Polyethylene, 3.5 mils thick, 75 mm wide, clearly marked as follows:

.1 "CAUTION - BURIED ELECTRICAL CONDUIT", colour red with black text.

PART 2 - EXECUTION

2.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

2.2 STOCKPILING

.1 Stockpile fill materials in areas designated by Airport Representative. Stockpile granular materials in manner to prevent segregation.

2.3 SUBSURFACE CONDITIONS

.1 Promptly notify Airport Representative if surface conditions at Place of Work differ materially from those indicated in Contract Documents, or reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Airport Representative determine that conditions do differ materially, instructions will be issued for changes in the Work.

2.4 EXCAVATION – GENERAL

.1 Perform excavations only to extent where excavations can be backfilled by end of shift.

.1 Temporary backfilling and re-excavation is permitted at no additional cost to the contract.

.2 No excavation mounds are permitted within the operational area at the end of a work shift.

.2 Excavate in all kinds of materials including rock encountered on Site and make own computations of amounts and nature of excavation required.

.3 Select method of excavation, support and dewatering suitable for the works. Submit proposed method to Airport Representative for record.

.4 Prior to excavating trenches, put measures in place to handle and monitor pumped water from trench excavations, as per the Contractor's Sediment and Erosion Control Plan. Monitor water for pH and suspended solids, and discharged in an approved manner.

.5 Protect property or structures above or below ground in accordance with the Contract.

.6 Bear foundations or underside of all structures including pipe surrounds on the material as shown on the Drawings and neatly finish all bearing surfaces to the required levels and grades.

.7 Earth bottoms of excavations to be undisturbed soil, free from loose, soft, or organic matter. Remove any soil softened due to frost or standing water prior to placing structures.

.8 Proof roll excavations of structure bearing surfaces in the presence of an experienced geotechnical inspector and allow for review of Airport Representative. Any soft spots are to be over excavated and backfilled with approved fill.

.9 If the excavated surface is unsuitable the Airport Representative will determine what work is required to secure a proper foundation. If such Work is due solely to the nature of the ground, then Airport Representative will measure the Work, but if such work is due to any act or default of the Contractor in carrying out the Works, resulting in disturbance of natural ground conditions, Execute such Work at no additional cost to the Contract.

.10 Excavation to greater depth than is shown on the Drawings will be at no additional cost to the Contract, unless ordered by Airport Representative. Make good trench bottom with approved granular material adequately compacted as approved by Airport Representative or with concrete as may be necessary for the safety or stability of the Works.

.11 Pile excavated material a safe distance away from sides of trench so it will not endanger personnel and the work, reduce sight distances, or obstruct roadways.

.12 Leave existing utility controls unobstructed and accessible at all times.

.13 Do not obstruct drainage ditches and natural watercourses.

.14 Airport Representative reserves the right to require surplus material to be placed for embanking, general grading or other improvement or use on site.

.15 Control grading so that the surface of the ground will be properly sloped to prevent water from running into excavated areas. Promptly remove any water which accumulates in excavations.

.16 Place excavated soil to be re-used as backfill in stockpiles properly graded and sealed against rain.

2.5 DEWATERING AND HEAVE PROTECTION

.1 Keep excavations and trenches free of water. Control excavations to prevent surface water running into excavated areas.

.2 Do Work in connection with dewatering and supply and maintain on the Work, pumps, in number and capacity sufficient to keep bottom of excavations dry and free from water so placing of pipe, manholes, and concrete will be done in the dry. Operate equipment for as long as necessary.

.3 Confirm sub-drains, sump holes, wells or the like required for dewatering shall not endanger the stability of the Works. On completion of the Work completely backfill and consolidate excavations.

.4 Dispose of water removed from excavations in a manner that will prevent injuries to public health or private property or to any operation of the work completed or under construction. Do not pump water containing silt or other material in suspension into natural water courses.

.5 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

2.6 STRUCTURE EXCAVATION

.1 Excavate to lines, grades, dimensions and elevations shown on Drawings.

.2 Extend excavations sufficient distance from footings and walls to allow placing and removal of forms and for placing backfill materials indicated.

2.7 TRENCH EXCAVATION

.1 Trenches for piping and related excavations to be of sufficient width and depth at all points to allow pipes to be laid, joints to be formed, and appurtenant structures to be built in a workmanlike manner, and when needed, to allow for sheeting and shoring, pumping, draining, and for removing and replacing all materials unsuitable for foundations.

.2 Excavate trenches so pipe can be laid to the alignment and depth required. Excavation length to be not more than the pipe length that can be laid and backfilled in one (1) day. Brace and drain trench so workers may work safely and efficiently.

.3 Remove organic material and soft deposits to a depth where medium dense to dense materials are encountered as designated by Airport Representative.

.4 Do not stockpile excavated materials alongside trench if the bearing soil will cause trench side failure or bottom uplift and affect pipe alignment.

2.8 UNSUITABLE MATERIAL EXCAVATION

.1 Notify Airport Representative when materials unsuitable for use in the work are encountered and remove to depth and extent as directed by Airport Representative.

.2 Backfill excavations with structural fill material or selected backfill material as directed by Airport Representative.

.3 Dispose of unsuitable material off site.

2.9 BACKFILLING – GENERAL

.1 At the start of pipe laying operations, the Contractor's geotechnical engineer is to be on-site to establish rolling and compaction patterns in the presence of the Airport Representative.

.2 Every day during pipe laying operations, or as otherwise directed by the Airport Representative, the Contractor's geotechnical engineer must be on-site to confirm compaction of bedding and backfill materials.

.3 Submit compaction results to the Airport Representative for approval.

.4 Do not proceed with backfilling operation until Airport Representative has inspected and approved installations.

.5 After pipelines and structures have been built, backfill trenches and other excavated areas with materials shown on Drawings or as specified. Remove timber and debris from excavation before backfilling is commenced. Do not cover up or put out of view any Work until it has been examined, measured and approved by Airport Representative. If any work is covered without approval of Airport Representative, Airport Representative may order backfilled excavation to be uncovered for examination.

.6 Place backfill in unfrozen condition.

.7 Do not backfill around or over cast-in-place concrete within 24 hours after placing.

.8 Where temporary unbalanced earth pressures are liable to develop on walls or other structures, permit concrete to cure minimum seven (7) days or until it has sufficient strength to withstand earth and compaction pressure.

.9 Place foundation material to provide suitable surface for construction as directed by the Airport Representative.

.10 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

2.10 BACKFILLING STRUCTURES

.1 After installation of structure, clean excavations of trash and debris. Backfill to consist of Structural Fill material or material shown on Drawings. Place material to meet following requirements and approval of the Airport Representative.

.1 Place backfill in horizontal layers not more than 300 mm deep.

.2 Compact each layer by rollers, mechanical tampers, or other suitable equipment to obtain a density of not less than 95% to ASTM D1557.

.3 Compact the Structural Fill placed below the structure and pavements to not less than 95% to ASTM D1557.

2.11 BACKFILLING TRENCHES

.1 Backfill trench from top of bedding to top of subgrade using materials shown on Drawings.

.2 Place backfill in 300 mm layers. Thoroughly compact each layer before placing next layer. Carry out compaction tests to demonstrate the effectiveness of backfill thickness per lift versus the number of passes with the selected equipment to achieve the specified compaction.

.1 Compact to 95% to ASTM D1557

.2 Compact to 98% to ASTM D1557 when backfill is to serve as granular subbase materials.

.3 Compact to 100% to ASTM D1557 when backfill is to serve as granular base materials.

.3 During backfilling, keep trenches free of water at all times and controlled so as to prevent surface water running into excavated areas. Remove silty materials, which become wetted and subsequently liquid or extremely plastic.

.4 Leave surface of backfill initially high and repair settlement of trench backfilling.

2.12 BACKFILLING – TESTING

.1 Provide material testing to minimum limits as follows:

.1 Testing of all areas except trenching:

Material	Compaction Test Frequency	Moisture Content Test Frequency
Select Backfill	1 per 45 m^3 placed	1 per 45 m^3 placed
Structural Fill	1 per 30 m^3 placed	1 per 30 m^3 placed

.2 Testing of trenching:

Material	Compaction Test Frequency
Granular Filter Material	1 per 15 m along trench per lift
Pipe Bedding	1 per 10 m along trench per lift
Sand Bedding	1 per 10 m along trench per lift
Select Backfill	1 per 15 m along trench per lift

2.13 MARKER TAPE

.1 Place marker tape and plank in trenches above electrical conduits and pipes, where indicated.

2.14 REINSTATEMENT

.1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects as directed by Airport Representative.

.2 Reinstate disturbed areas to condition, elevation and thickness equal to or better than that, which existed before excavation.

.3 Clean and reinstate areas affected by work as directed by Airport Representative.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies requirements for supply, producing and placing gravel or quarried stone as a granular base & subbase to lines, grades and typical cross sections indicated on the drawings.

.2 No additional measurement or payment will be made for granular base material required in correcting deficiencies or material contaminated by the Contractor's operations.

.3 No measurement or payment will be made for granular base material required in items of work other than for flexible and rigid pavements. Granular base or bedding material required for sewers, manholes, catchbasins, watermains, ductbanks, retaining walls, foundations, sidewalks, walkways, curbs, etc. shall be including in the rate for the applicable item of work as may be specified elsewhere.

1.2 RELATED SECTIONS

.1 Construction Waste Management and Disposal: Section 01 74 22.

.2 Airfield Pavement Base Reshaping: Section 31 22 16.

.3 Asphalt Paving: Section 32 12 16.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM) Most recent edition

.1 ASTM C117. Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft3) (2,700kN-m/m3).

.6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.7 ASTM D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Course Aggregate.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 22.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base material:

.1 Crushed gravel or rock.

.2 Granular A in accordance with OPSS 1010 and this specification.

.3 Gradations to be within limits specified in Table 1 when tested to ASTM C136 and ASTM C117.

.4 The granular materials shall be composed of clean, hard, uncoated particles and shall be free from organic matter, clay lumps and deleterious material such as shale, slate, ochre and schists.

.5 Material from deposits acceptable as to the quality of the particles, but deficient in sizes to provide the required gradation, may be accepted if the Contractor furnishes and satisfactorily incorporates into the product supplementary sizes from other sources to produce the required grading.

.6 Materials shall be considered unsuitable even though particle sizes are within the specified gradation limits if particle shape or any other characteristic precludes satisfactory compaction or fails to provide a roadway suitable for traffic.

.7 Materials shall conform to the gradation requirements given in Table 1 and to the physical requirements of Table 2.

.8 Granular “A” shall be processed by crushing and, when necessary to eliminate surplus fines passing the 4.76mm sieve, shall be screened and washed.

Table 1 Gradation Limits

Percent Passing By Dry Weight	
Sieve Sizes	**Granular "A" Base**
26.5mm	100
19.0 mm	85 - 100
13.2 mm	65 - 90
9.5 mm	50 - 73

4.75 mm	35 - 55
1.18 mm	15 - 40
300 µm	5 - 22
75 µm	2-8 (Pit Source)
	2-10 (Rock Source)

.1 Where forty percent or more of the materials from a pit source is blended to a rock source for the production of granular materials, it shall then be treated as a pit source.

TABLE 2 Physical Requirements

Physical Test	Standard Designation	Granular "A"
Los Angeles Abrasion (loss % Maximum)	C131	35
Percent Crushed (Minimum)	ASTM D5821	60
Plasticity Index	ASTM D4318	3
Micro-Deval Test for Fine Aggregate (% Max.)	CSA A23.2-23A	30
Micro-Deval Test for Coarse Aggregate (% Max)	MTO LS 618	25
Flat and Elongated Particles (4 to 1)	ASTM D4791	20

PART 3 - EXECUTION

3.1 CERTIFICATION

.1 Provide certification from approved independent third party testing laboratory that granular base materials meet material properties specified.

.2 Provide continual testing throughout production of Granular Base Materials.

3.2 PRODUCTION TESTING FREQUENCY

.1 Follow testing frequencies included in Table 3 during aggregate production and stockpiling.

TABLE 3 Testing Frequency

Test	Test Method	Frequency
Gradation	ASTM C136	Min 2 per day
Moisture Density	ASTM D1557	Min 2 Per Material Type
Los Angeles Abrasion	ASTM C131	Min 2 Per Material Type
Percent Crushed	ASTM D5821	Min 2 per day
Micro Deval (Fine and Coarse)	CSA A23.2-23A and MTO LS 618	Min 2 Per Material Type

3.3 PLACING

.1 Construct granular base to depths and grades in areas indicated.

.2 Do not place any frozen material.

.3 Place material only on clean unfrozen surface, free from snow or ice.

.4 Place granular base materials using methods which do not lead to segregation or degradation.

.5 Place material to full width in uniform layers not exceeding 150mm compacted thickness. Airport Representative may authorize thicker lifts if specified compaction can be achieved.

.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.7 Remove and replace portion of layer in which material has become segregated during spreading.

3.4 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact granular base to density of not less than 100% corrected maximum dry density in accordance with ASTM D1557.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted material.

.4 Where necessary to obtain the required compaction, the Contractor shall apply sufficient water by means of an approved distributor.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Airport Representative.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.7 Compaction operations shall be carried out as closely as possible behind the placing and spreading operations. At the end of each working day, all materials placed shall have been compacted to the specified density.

3.5 PLACEMENT TESTING

.1 Provide material testing during placement to minimum limits in Table 4:

Table 4 Testing Frequencies

Material	Compaction And Moisture Test Frequency (Nuclear)	Gradation
Granular “A”	1 per 400 m^2/lift placed	1 per 1500 Tonnes placed

3.6 SITE TOLERANCES

.1 The finished surface shall not deviate at any place on a 3m straight edge by more than 10mm for Granular “A” base.

3.7 PROTECTION

.1 Maintain finished base in condition conforming to this section until respective succeeding materials are constructed.

3.8 SCHEDULING WORK

.1 Do not commence placement of granular base until trenching and pipe laying activities and reshaping of existing base have been completed and inspected and reviewed by Airport Representative. Minimize contamination of granular materials.

.2 Do not use any portion of the granular base for temporary access during construction. Provide granular materials as required for such temporary access at no additional cost to the Contract.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This specification covers the requirements for in-place full depth pulverization of bituminous pavement and mixing with a portion of the underlying granular, and shaping and compacting the processed materials as granular base.

1.2 RELATED SECTIONS

.1 Asphalt Paving: Section 32 12 16.

1.3 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASTHO), Most recent edition

.1 AASHTO T245, Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.

.2 American Society for Testing and Materials (ASTM), Most recent edition

.1 ASTM C117. Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft3) (2,700kN-m/m3).

.3 MTO Laboratory Testing Manual:

.1 LS-621 Determination of Amount of Asphalt-Coated Particles in Coarse Aggregate

PART 2 - PRODUCTS

2.1 EQUIPMENT

PART 3 - EXECUTION

3.1 GENERAL

.1 The work of in-place full depth pulverization shall consist of pulverizing the existing bituminous pavement, mixing the processed material with the underlying granular material, and shaping and compacting the blended material.

3.2 IN-PLACE PULVERIZATION

.1 The in-place full depth pulverization including pulverizing, mixing, shaping, and compacting to final grade shall be completed across the full pavement width prior to closing down operations each day.

.2 The bituminous pavement and underlying granular shall be pulverized to a depth on 300mm

.1 The tolerance for the average depth of processing shall be $\pm$ 15 mm from the depth specified.

.3 The processed depth shall be such that the blended material shall contain a maximum of 50% by mass of asphalt coated aggregate in the final blend as determined by LS-621.

.4 The operation of full depth pulverization shall ensure that 100% of the mixed material passes the 26.5 mm sieve and not more than 75% passes the 4.75 mm sieve.

3.3 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact granular base to density of not less than 100% corrected maximum dry density in accordance with ASTM D1557.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted material.

.4 Where necessary to obtain the required compaction, the Contractor shall apply sufficient water by means of an approved distributor.

.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.6 At the end of each working day, all materials pulverized shall have been compacted to the specified density.

3.4 PLACEMENT TESTING

.1 Provide material testing during placement to minimum limits in Table 1:

Table 1 Testing Frequencies

Material	Compaction And Moisture Test Frequency (Nuclear)	Gradation
Processed Material	1 per 400 m^2	1 per 2500 m^2

3.5 SITE TOLERANCES

.1 The finished surface shall not deviate at any place on a 3m straight edge by more than 10mm for pulverized material.

3.6 PROTECTION

.1 Surfaces of processed material that have been exposed to traffic shall be scarified and recompacted immediately prior to placement of hot mix asphalt.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This method covers measurement of loss of Marshall Stability resulting from action of water on compacted asphalt paving mixtures containing penetration grade asphalt cement.

.2 Numerical index of retained stability is obtained by comparing stability of specimens determined in accordance with usual Marshall Procedures with stability of specimens that have been immersed in water for prescribed period.

1.2 RELATED SECTIONS

.1 Asphalt Paving: Section 32 12 16.

1.3 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASTHO), Most recent edition

.1 AASHTO T245, Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 One or more water baths with automatic controls for immersing specimens. Baths normally used for Marshall testing are suitable for test.

.2 Scale and water bath with suitable accessory equipment for weighing test specimens in air and in water to determine their densities.

.3 Flat transfer plates of glass or metal. Keep one plate under each specimen during immersion period and during subsequent handling, except when weighing and testing, to prevent breakage or distortion of specimens.

.4 Apparatus required to conduct the Marshall test.

PART 3 - EXECUTION

3.1 PREPARATION OF TEST SPECIMENS

.1 Prepare at least eight (8) specimens for each test in accordance with AASHTO T245, except where specified otherwise.

3.2 TEST PROCEDURE

.1 Do Marshall testing in accordance with AASHTO T245.

.2 Weigh each specimen in air and in water. Weigh in water as rapidly as possible to minimize absorption.

.3 Calculate specific gravity of each specimen as follows:

.1 Specific Gravity = A / (A-B)

.2 Where A = weight of specimen in air in grams

.3 B = weight of specimen in water in grams

.4 Sort each set of 8 specimens into 2 groups of 4 specimens each so that average specific gravity of specimens in group one (1) is essentially same as that of group two (2).

.5 Test group one (1) specimens for Marshall stability. Calculate S1 = Marshall stability of group one (1) (average).

.6 Immerse group two (2) specimens in water for 24 h at 60°C, then test immediately for Marshall stability. Calculate S2 = Marshall stability of group two (2) (average).

3.3 TEST FREQUENCY

.1 Provide one (1) test for each respective Base Course and Surface Course mix design sample.

3.4 TEST REPORT

.1 Report test results to Airport Representative.

.2 Report numerical index of retained stability as resistance of asphaltic paving mixtures to detrimental effect of water, expressed as percentage of original stability retained after immersion period.

.3 Calculate index as follows:

.1 Index of Retained Stability = S2/S1 x 100.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Asphalt Paving: Section 32 12 16.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM): most recent edition

.1 ASTM D140, Standard Practice for Sampling Bituminous Materials.

.2 ASTM D977, Standard Specification for Emulsified Asphalt.

1.3 SUBMITTALS

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

.2 Submit two (2) 1.0L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth bottles made with plastic to Airport Representative at least three (3) weeks prior to commencing Work.

.3 Sample asphalt tack coat material to: ASTM D140.

.4 Provide access on tank truck for Airport Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140.

1.4 QUALITY ASSURANCE

.1 Submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this section in accordance with Section 01 33 00 - Submittal Procedures.

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Provide, maintain and restore asphalt storage area.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal, and with the Waste Reduction Work Plan.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Emulsified asphalt: to ASTM D977 grade:

.1 SS-1 or SS-1h

.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 5.4 L/m2 with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m2.

.4 Distributed in uniform spray without atomization at temperature required.

.2 Equipped with meter, registering meters 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 Equipped with nozzle spray bar, with operational height adjustment.

.8 Cleaned if previously used with incompatible asphalt material.

PART 3 - EXECUTION

3.1 APPLICATION

.1 Obtain Airport Representative's 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 Airport Representative.

.4 Apply asphalt tack coat evenly to pavement surface at rate between 0.15 and 0.4 L/m2.

.5 Paint contact surfaces of asphalt longitudinal and transverse joints, manholes and other 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 two (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 Airport Representative.

.9 Keep traffic off tacked areas until asphalt tack coat has set.

.10 Re-tack contaminated or disturbed areas as directed by Airport Representative.

.11 Permit asphalt tack coat to set before placing asphalt pavement.

.12 Apply asphalt tack on all asphalt surfaces to be paved on, including new hot mix asphalt.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Asphalt Tack Coat: Section 32 12 14.

.2 Painted Lines and Markings: Section 32 17 23.

1.2 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASHTO) Most recent edition

- .1 AASHTO M320- Standard Specification for Performance Graded Asphalt Binder.
- .2 AASHTO R29- Standard Specification for Grading or Verifying the Performance Grade of an Asphalt Binder.
- .3 AASHTO T283- Standard Method of Test for Resistance of Compacted Asphalt Mixtures to Moisture - Induced Damage (Lottman).

.2 Asphalt Institute (AI)

- .1 AI MS-2 Seventh Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.

.3 American Society for Testing and Materials International, (ASTM). Most recent edition.

- .1 ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM C117 - Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
- .3 ASTM C123 - Standard Test Method for Lightweight Particles in Aggregate.
- .4 ASTM C127 - Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
- .5 ASTM C128 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
- .6 ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .7 ASTM C136 - Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- .8 ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
- .9 ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

.10 ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.11 ASTM D2172 - Extraction of Bituminous Paving Mixtures.

.12 ASTM D2480 - Standard Practice for Estimating Degree of Particle Coating of Bituminous Aggregate Mixtures.

.13 ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.

.14 ASTM D3203 - Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

.15 ASTM D4791 - Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.16 ASTM D5361 - Standard Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing.

.17 ASTM D5444 - Standard Test Method for Mechanical Size Analysis of Extracted Aggregate.

.18 ASTM D6927 - Standard Test Method for Marshall Stability and Flow of Asphalt Mixtures.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.

1.3 PRODUCT DATA

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

.2 Submit viscosity-temperature chart for asphalt cement to be supplied showing Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C at least three (3) 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 designs and trial mix test results to Airport Representative for review at least three (3) weeks prior to beginning Work.

1.4 SAMPLES

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

.2 Inform Airport Representative of proposed source of aggregates and provide access for sampling at least three (3) weeks prior to beginning Work.

.3 Submit samples of following materials proposed for use at least three (3) weeks prior to beginning Work.

.1 Two (2) 5.0 L containers of asphalt cement.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Stockpile minimum 50% 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 (2) mix components are permitted.

.4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

.5 Submit to Airport Representative copies of freight and waybills for asphalt cement as shipments are received. Airport Representative reserves right to check weights as material is received.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Performance graded liquid asphalt cement: to AASHTO M320, grade PG 52 - 40 when tested to AASHTO R29.

.1 Protect asphalt cement from freezing in accordance with manufacturer's handling and storage recommendations.

.2 Aggregates:

.1 Crushed stone or gravel.

.2 Gradations: within limits specified when tested to ASTM C136 and ASTM C117.

Table 1

Sieve Designation	% Passing	
	Base Course	Surface Course
25 mm	100	
12.5 mm	70 – 85	100
4.75 mm	40 – 65	55 – 75
2.00 mm	30 – 50	35 – 55
0.425 mm	15 – 30	15 – 30
0.180 mm	5 – 20	5 – 20
0.075 mm	3 - 8	3 – 8

.3 Coarse aggregate: aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C136.

.4 Process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.

.5 Do not use aggregates having known polishing characteristics in mixes for surface courses.

.6 Coarse Aggregate physical properties to meet requirements of Table 2.

Table 2

Test Method	Test No.	Surface	Base
Los Angeles Abrasion - % Maximum	ASTM C131	30	30
Absorption - % Maximum	ASTM C127	1.75	2.0
Coarse Aggregate Magnesium Sulphate Soundness - 5 Cycles - % Maximum	ASTM C88	12	12
Petrographic Number - Maximum	LS 609	135	135
Freeze-Thaw Test - 5 Cycles - % Maximum	CSA A23.2-24A	8	10
Crushed Particles -% Minimum (A)	ASTM D5821	90	90
Flat & Elongated Particles - % Maximum (B)	ASTM D 4791	20	20
Loss By Washing - % Maximum Passing	ASTM C117	1.75	1.75
Micro Deval - % Maximum	ASTM D 6928	20	20

A) Pieces having two or more freshly fractured faces only will be considered as crushed material. Pieces with only small chips removed will not be considered as crushed.
B) Flat and elongated pieces are those whose greatest dimension exceeds four times their least dimension.

.7 Fine Aggregate physical properties to meet requirements of Table 3.

Table 3

Test Method	Test No.	All Courses
Micro-Deval Test for Fine Aggregate - % Maximum	CSA A23.2-23A	20
Plasticity Index	ASTM D4318	3
Sand Equivalent - % Minimum	ASTM D 2419	50
Fine Aggregate Angularity - % Minimum	ASTM C 1252	45

.3 FAA tests shall be conducted on a representative sample of the total fine aggregate inclusive of all fine aggregate materials as indicated in the mix design including blending sand. The test will be conducted in accordance with Standard Graded Sample Method A.

.4 Aggregate Production Testing Frequency

.1 When producing aggregates for asphalt concrete, follow testing frequency supplied in Table 4.

Table 4

Test	Frequency
Gradation (C136)	Min 2 per day
Crushed Content	Min 2 Per day

.5 Mineral filler:

.1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.

.2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties.

.3 Mineral filler to be dry and free flowing when added to aggregate.

.6 Anti-stripping agent: to recommendations provided in mix designs.

.7 Water: to approval of Airport Representative.

2.2 EQUIPMENT

.1 Pavers: electronic grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Material Transfer Vehicles (MTV): self-powered asphalt remixing "Shuttle Buggy" type vehicle capable of smoothly transferring asphalt from haul truck to paver.

.1 Size to be compatible with associated paver.

.2 Allow continuous uninterrupted feeding of paver hopper.

.3 Rollers: minimum of three per paver of type and weight to obtain specified density of compacted mix.

.4 Vibratory rollers:

.1 Minimum drum diameter: 1200 mm.

.2 Minimum drum width: 2000 mm

.3 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts 40 mm thick and less.

.5 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Insulated boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.

.3 Use only trucks which can be weighed in single operation on scales supplied.

.6 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. Approved mechanical compaction equipment may be used instead of tamping irons.

.3 Straight edges, 4.5 m in length, outfitted with integral level calibrated at 1.5% to test finished surface.

2.3 MIX DESIGN

.1 Have mix design developed by a CCIL certified testing laboratory approved by Airport Representative.

.2 Design of mix: by Marshall method to requirements below.

.1 Compaction blows on each face of test specimens: 50.

.2 Mix physical requirements:

Table 5

Property	Airfield Pavements
Marshall Stability at 60°C kN min	9.0
Flow Value, mm	2 - 4
Air Voids in Mixture, %	3 - 5
Voids in Mineral Aggregate, % min	15 surface course 13 base course
Tensile Strength Ratio (plus visual), % min	80

.3 Measure physical requirements as follows:

.1 Marshall load and flow value: to ASTM D6927.

.2 Compute void properties on basis of bulk specific gravity of aggregate to ASTM C127 and ASTM C128. Make allowance for volume of asphalt absorbed into pores of aggregate.

.3 Voids in mineral aggregates: to AI MS-2.

.4 Tensile Strength Ratio: to AASHTO T283.

.4 Do not change job-mix without prior approval of Airport Representative. When change in material source is proposed, new job-mix formula to be reviewed by Airport Representative.

.5 Return plant dust collected during processing to mix in quantities acceptable to Airport Representative.

.6 Provide manufacturer's information on anti-stripping agent if required to meet TSR, provide virgin and anti-stripping added TSR values.

PART 3 - EXECUTION

3.1 MOBILE PLANT MIXING REQUIREMENTS

.1 Mobile batch and continuous mixing plant:

.1 Current Certificate of Approval for construction and operation of mobile plant in accordance with current Ontario government requirements and provided to Airport Representative.

.2 Minimum rated production of 200 tonnes per hour.

.3 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders. Do not load frozen materials into bins.

.4 Feed cold aggregates to plant in proportions to ensure continuous operations.

.5 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.

.6 Before mixing, dry aggregates to moisture content not greater than 0.5% by mass or to lesser moisture content if required to meet mix design requirements.

.7 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.

.8 Store hot screened aggregates in manner to minimize segregation and temperature loss.

.9 Heat asphalt cement and aggregate to mixing temperature directed by Airport Representative. Do not heat asphalt cement above maximum temperature indicated on temperature-viscosity chart.

.10 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, Airport Representative to review temperature of completed mix at plant and at paver after considering hauling and placing conditions.

.11 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.

.12 Mixing time:

.1 In batch plants, both dry and wet mixing times as directed by Airport 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 Airport Representative but not less than 45s.

.3 Do not alter mixing time unless directed by Airport Representative.

.2 Dryer drum mixing plant:

.1 Minimum rated production of 200 tonnes per hour.

.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.

.1 Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time.

.2 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 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 0.5%.

.3 Temporary storage of hot mix:

.1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.

.2 Do not store asphalt mix in storage bins in excess of two (2) hours.

.4 While producing asphalt mix for this Project, do not produce mix for other users.

.5 Mixing tolerances:

.1 Permissible variation in aggregate gradation from job mix (percent of total mass).

Table 6

Sieve Designation	% Total Mass
larger than 4.75 mm sieve	5.0
4.75 mm and 2.00 mm sieve	3.0
0.425 mm sieve	2.0
0.180 mm sieve	2.0
0.075 mm sieve	1.0

.2 Permissible variation of asphalt cement from job mix: 0.25%.

.3 Permissible variation of mix temperature at discharge from plant: 5°C.

3.2 PREPARATION

.1 Reshape granular runway base and compact in accordance with Section 31 22 16 - Airfield Pavement Base Reshaping.

.2 Prior to laying mix, clean surfaces of loose and foreign material.

3.3 TRANSPORTATION OF MIX

.1 Transport mix in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, daily. Elevate truck bed and thoroughly drain. No excess solution to remain in truck bed.

.3 Schedule delivery of material for placing in daylight, unless Airport 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 Airport Representative, but not less than 135°C.

3.4 TEST STRIP

.1 Construct and test strip to approval of Airport Representative.

.2 Construct test strip in non-critical area to resolve anticipated problems with mobile plant equipment, mix behavior or compaction, prior to starting paving operation.

.3 Construct test strip with at least 200 tonnes of mix, and involving two (2) lanes, so that joint finishing techniques can be established.

.4 During construction of test strip, Airport Representative will 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 by coring in order to determine if additional or other rolling equipment is required to achieve density of not less than 93% of

theoretical maximum density prepared from samples of mix being used.

.6 If suitable location for the test strip cannot be found at the airport, the contractor shall be responsible to find a suitable location with no cost to the Airport.

3.5 PLACING

.1 Obtain Airport Representative's approval of each respective layer of asphalt structure prior to placing subsequent layer for:

.1 Surface course.

.2 Tack.

.3 Base Course.

.4 Runway granular base.

.2 Provide minimum two (2) asphalt pavers of similar make and model so that paving is not delayed in the event of a breakdown.

.3 Placing conditions:

.1 Place asphalt mixtures only when air temperature is above 5°C and rising,

.2 When temperature of surface on which material is to be placed falls below 10°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 indicated on drawings.

.5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than that indicated on drawings.

.6 Place individual strips not longer than 500m.

.7 Commence spreading at high side of pavement or at crown and span crowned centerlines with initial strip.

.8 Spread and strike off mixture with self-propelled mechanical finisher.

.1 Construct longitudinal joints and edges true to line markings. Airport 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 paving 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 placed surfaces.

.9 Shuttle Buggy (Roadtec 2500B or equivalent)

.1 A self-powered material transfer vehicle between asphalt truck and paver that allows paver to run continuously, either in-line or adjacent lane and enhances smoothness and minimizes segregation of the surface course. Two shuttle buggies are required for all phases of the work.

.10 When hand spreading is used:

.1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.

.2 Distribute material uniformly. Do not broadcast material.

.3 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.

.4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.

.5 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 Do not change rolling pattern unless mix changes or lift thickness changes. Change rolling pattern only as directed by Airport Representative.

.2 Roll asphalt continuously to density not less than 93% of the maximum theoretical density of the comparative laboratory Marshall mixture to ASTM D2041.

.3 Provide continual compaction control with a Nuclear Densometer, to be calibrated using cores extracted from test strip.

.4 General:

.1 Provide at least three (3) 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 Overlap successive passes of roller by minimum of 300 mm and vary pass lengths.

.5 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

.6 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

.7 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

.8 After transverse 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.

.9 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.

.5 Breakdown rolling:

.1 Begin breakdown rolling with 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.

.4 Use only experienced roller operators.

.6 Intermediate rolling:

.1 Use pneumatic-tired 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.

.7 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 Airport 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 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

.2 Transverse joints:

- .1 Offset transverse joint in succeeding lifts by at least 450 mm.
- .2 Preheat face to match asphalt placement temperature. Tack face with thin coat of tack coat.
- .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.

.3 Longitudinal joints:

- .1 Offset longitudinal joints in succeeding lifts by at least 300 mm.
- .2 Preheat face to match asphalt placement temperature with joint heater and tack face with thin asphalt tack coat immediately ahead of paver operations.
  - .1 Remove waste asphalt and reinstate disturbed granular base prior to application of prime coat.
  - .2 Remove all loose millings prior to application of tack coat.
  - .3 Do not overheat joints.
- .3 Overlap previously laid strip with spreader by 25 to 50 mm.
- .4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
- .5 Roll longitudinal joints directly behind paving operation.
- .6 Compact joint to density not less than 93% of the maximum theoretical density
- .7 Areas of segregation to be removed and reinstated at contractor’s expense.

3.8 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5mm 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.

.4 If, at any time before the Work is finally accepted, any raveling, shoving or other fault develops in the pavement as laid, remove all mixed materials in such places, cut edges of joints square and paint with tack coat. Place fresh asphalt mixture and compact. Do all such removal and replacement of unsatisfactory material at no additional cost to the Contract.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Asphalt Paving: Section 32 12 16.

1.2 REFERENCES

.1 TTP-1952E, Federal Specification (US), Traffic and Airfield Marking, Waterborne (06-Aug-2007) Rev E 08-2000.

.2 TP312E - Aerodomes Standards and Recommended Practices 5th edition, September 2015

.3 ASTM E1347-03 – Standard Test Method for Colour and Colour-difference Measurement by Tristimulus (filter) Colorimetry.

.4 ASTM D1155-03 – Standard Test Method for Roundness of Glass Spheres.

.5 ASTM D1214-04 – Standard Test Method of Sieve Analysis of Glass Spheres.

.6 ASTM E11-04 – Standard Specification for Wire Cloth Sieves for Testing Purposes.

.7 OPSS 1712 – Organic Solvent Based Traffic Paint

.8 OPSS 1750 – Material Specification for Traffic Paint Reflectorizing Glass Beads.

1.3 SUBMITTALS

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

.2 Submit paint manufacturer's product data and one (1) 3.78 litre can of each colour and type of paint.

.3 Submit technical data sheets of mobile needle water jet marking removal equipment for review. Equipment to be capable of removal and recovery of debris simultaneously with blasting process.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint: to TTP-1952E, low VOC acrylic waterborne airfield marking paint.

.1 Colour: white.

.2 Colour: yellow for applicable taxiway markings.

.3 Colour: black for black-out markings.

.4 Temporary markings: Type I, normal condition.

.5 Permanent markings: Type III, adverse conditions.

.2 Blasting media: potable water.

.3 Reflectorizing glass beads for use with traffic paint:

.1 Specification: Reflectorizing glass beads:

.1 OPSS 1750.05.01 – Durability.

.2 OPSS 1750.05.02 – Colour.

.3 OPSS 1750.05.03 – Bead Type & Grade.

.4 OPSS 1750.07.01 – Roundness.

.5 OPSS 1750.07.02 – Gradation.

.6 OPSS 1750.07.03 – Refractive Index.

.7 OPSS 1750.07.04 – Imperfections.

.2 Supplier of glass beads must be listed in Ontario Ministry of Transportation (MTO) Designated Sources for Materials Manual (DSM).

.3 When requested by the Airport Representative, arrange and pay costs to verify at a laboratory approved by Engineer that glass beads meet the applicable specifications

PART 3 - EXECUTION

3.1 EQUIPMENT REQUIREMENTS

.1 Paint applicator to be an approved atomizing spray-type marking machine capable of applying paint in single, double and dashed lines, as required, for cold paint application and to have positive shut-off.

.2 Applicator to be capable of applying marking components to produce an even and uniform film thickness at the required application rates specified, and apply markings of uniform cross-sections and clear-cut edges without running, spattering, over-spray, and to dimensions as indicated. Applicator shall include a wind screen or shroud suitable to prevent displacement of materials by wind.

3.2 PAVEMENT MARKING REMOVAL

.1 Remove existing paint markings by water blasting to suit temporary marking plans in areas where existing pavement is to remain.

.2 Blacking out of existing paint markings is permitted in areas where existing pavement is to be subsequently demolished.

.3 Remove temporary paint markings by water blasting in areas where temporarily painted surface is to remain.

3.3 CONDITION OF SURFACES

.1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

3.4 PREPARATION OF SURFACES

.1 First (1st) Coat: Immediately before application of the first (1st) coat, the surface shall be dry and free from dirt, grease, oil, laitance, dust and other foreign materials that would reduce the bond between the paint and the pavement.

.2 Second (2nd) Coat: Immediately before application of the second (2nd) coat, the existing painted surfaces shall be dry and free from dirt, peeled and scaled paint, grease, oil, laitance, frost, ice, dust and other foreign materials that would reduce the bond between the new paint and the existing painted surface.

3.5 APPLICATION

.1 Lay out temporary and permanent pavement markings as indicated and to the approval of the Airport Representative.

.2 Unless otherwise approved by Airport Representative, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within the greater of the manufacturer's recommended curing time or four (4) hours.

.3 Apply paint evenly at rate recommended by manufacturer where indicated on the Project Drawings.

.4 Do not thin paint unless approved by Airport Representative.

.5 Symbols and letters to conform to dimensions indicated.

.6 Paint lines to be of uniform colour and density with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Permanent markings shall be applied in two coats at an application rate of 2.2 m^2 per litre for Type III permanent markings and 2.8 m^2 per litre for Type I temporary markings.

3.6 APPLICATION – GLASS BEADS

.1 Glass beads shall be distributed upon the marking areas immediately after application of the paint. Provide machine mounted dispenser suitable for dispensing glass beads.

.2 Glass beads shall be distributed at a minimum rate of 1.0 kg per litre.

.3 Bead dispensers shall be calibrated at the beginning of the project to the proper flow rate and monitored throughout the course of the project to ensure proper bead coverage.

.4 Glass beads shall adhere to and be properly embedded in the cured paint or all marking operations shall cease until corrections are made.

3.7 TOLERANCE

.1 Permanent paint markings to be within plus or minus 12mm of dimensions indicated.

.2 Remove incorrect markings as directed by Airport Representative.

3.8 QUALITY CONTROL

.1 Use equipment that is calibrated to the application rates specified.

.2 Prior to commencing Work, Contractor to demonstrate by testing or other means that application rate in the field conforms to the specified requirements.

3.9 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

.2 All surfaces shall be protected from excess moisture and/or rain and from disfiguration by splatter, splashes, spillage, or drippings of paint.

3.10 TEMPRARY MARKING REMOVAL

.1 Temporary paint markings to be removed from finish asphalt surfaces using approved high production rate micro shot blaster.

.1 Micro shot blaster to be self-contained mobile unit, complete with integral blast waste vacuum system.

END OF SECTION