



**Engineering Ltd.**

**Town of Drumheller**

**Drumheller Municipal Airport (CEG4) Rehabilitation**

**2450-053-00**

**February 2022**

*Proud of Our Past... Building the Future*

**Town of Drumheller**  
**Drumheller Municipal Airport (CEG4) Rehabilitation**



Eric Dyson, P.L.(Eng.)  
Transportation  
February 8<sup>th</sup>, 2022

PERMIT TO PRACTICE MPE ENGINEERING LTD.	
Signature	<u>Eric A. Dyson</u>
APEGA ID	<u>155319</u>
Date	<u>February 8<sup>th</sup>, 2022</u>
PERMIT NUMBER: P 3680	
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

Prepared by MPE Engineering Ltd.

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PREAMBLE

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The format of these Specifications is based on "MasterFormat" published jointly by Construction Specifications Canada and The Construction Specifications Institute. This Table of Contents generally reflects the "MasterFormat" division and section arrangement.

Where it is indicated that a division of "MasterFormat" is "Not Used", or where a division heading is omitted entirely, this means only that the division has not been included in the Specification. It does not necessarily mean that the work normally specified in that division is not required.

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MasterFormat  
Broadscope  
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**1. BID SUBMISSION**

- .1 Bidders must submit bids through the Online Bidding System (<https://mpe.bidsandtenders.ca/>).
- .2 Bidders may submit bids only before the time and date set by for receiving bids on the Online Bidding System.
- .3 The time as indicated by the declining time clock on the Online Bidding System shall be the official time for closing. Bids submitted after the Online Bidding System closing time will not be allowed by the Online Bidding System.
- .4 Hard copy, oral, telephone, telegram, fax, or e-mail bids will not be accepted nor acknowledged.
- .5 The foregoing states the date and time before which bids will be received hereinafter called the "bid closing time".
- .6 Bids shall be prepared and submitted and the bidding process will be administered in accordance with these bidding requirements.

**2. SUMMARY**

- .1 The intent of this bid call is to solicit and receive formal offers for:  
**Drumheller Municipal Airport (CEG4) Rehabilitation**
- .2 Refer to Section 01110 - Summary of Work for a summary of the Project, including requirements pertaining to Contract Time.

**3. BASIS OF BID - UNIT PRICE**

- .1 Bids shall be on a unit price basis.
- .2 The unit prices, lump sums and allowances stated in the Bid Form and Schedule of Prices shall form the basis of the bid price.
- .3 Make entries in the Bid Form and Schedule of Prices in figures only. Ensure that figures are legible.
- .4 Where, in the Owner's opinion, there is a question as to the legibility of figures entered by the Bidder, the Owner will make a determination as to legibility. The Owner may, at the Owner's sole discretion, declare as invalid and reject any bid that contains figures which, in the Owner's opinion, are illegible or open to dispute.
- .5 Extensions of unit prices and addition of extended unit prices, lump sums and allowances entered in the Schedule of Prices will be checked by the Owner. If arithmetical errors are discovered, the unit prices shall be considered as representing the Bidder's intentions and the unit price extensions and the total amount entered in the Bid Form and Schedule of Prices will be corrected by the Owner. The Bidder shall be bound to such corrected amounts.

- .6 If no unit price is stated for an item, but an extended amount is stated, a unit price determined by dividing the extended amount by the estimated quantity shall be considered as representing the Bidder's intentions.
- .7 The total amount of the bid shall be the arithmetically correct sum of the arithmetically correct unit price extensions, lump sums and allowances in the Bid Form and Schedule of Prices.
- .8 Each unit price stated in the Bid Form and Schedule of Prices shall be a reasonable price for that item of work.
- .9 Unless otherwise indicated, quantities specified in the Bid Form and Schedule of Prices are estimated quantities and shall not be considered as actual quantities of work to be performed. Subject to Contract terms, unit prices stated in the Bid Form and Schedule of Prices shall be applied to actual quantities of work performed as measured in accordance with the Contract.
- .10 Taxes will be automatically applied to the Total Contract Amount in the Summary Table of the Schedule of Prices on the Online Bidding System. Each unit price stated in the Bid Form and Schedule of Prices should not include taxes. The Bidder is responsible for verifying the Total Contract Amount stated in the Summary Table prior to submission.

**4. SUFFICIENCY OF BID**

- .1 The submission of a bid shall constitute an incontrovertible representation by the Bidder that:
  - .1 The Bidder has complied with all bidding requirements,
  - .2 The Bidder is qualified and experienced to perform the Work in accordance with the Bid Documents,
  - .3 The bid is based upon performing the Work in accordance with the Bid Documents, without exception, and
  - .4 The price or prices stated in the bid cover all the Bidder's obligations under the Contract and all matters and things necessary for the performance of the Work in accordance with the Bid Documents.

**5. BID DOCUMENTS**

- .1 The Bid Documents are the documents issued or made available to Bidders by the Owner for the purpose of preparing a bid. The Bid Documents consist of the following:
  - .1 Instructions to Bidders.
  - .2 Bid Security.
  - .3 Bid Form Supplements.
  - .4 Agreement Form.

- .5 Definitions.
- .6 Payment Conditions.
- .7 Contract Performance Security.
- .8 Security for Payment of Claims.
- .9 Insurance Conditions.
- .10 General Conditions of Contract.
- .11 Supplementary Conditions.
- .12 Specifications, Divisions 1 to 16 inclusive.
- .13 Drawings.
- .14 Addenda issued during the bid period.
- .15 Contract Information Documents.

**6. BID FORM SUPPLEMENTS**

- .1 Prepare and submit the Bid Form and Schedule of Prices on the Online Bidding System.
- .2 The Owner may, after bid closing time and before contract award, require any Bidder to submit, in a form prescribed by or acceptable to the Owner, supplementary information about any aspect of the Bidder's bid which, in the Owner's opinion, is necessary for bid evaluation purposes.

**7. BID WITHDRAWAL AND ACCEPTANCE**

- .1 A bid may be withdrawn through the Online Bidding System at any time before the bid closing time.
- .2 Withdrawn bids may be resubmitted in accordance with these bidding requirements providing the resubmitted bid is received through the Online Bidding System as indicated in 1.1, before the bid closing time.
- .3 A bid may not be withdrawn at or after bid closing time and shall be open to acceptance by the Owner until:
  - .1 Some other Bidder has entered into a contract with the Owner for the Work, or
  - .2 60 days after the bid closing time,whichever occurs first.
- .4 The 60 day period referred to above shall commence at midnight of the date of the bid closing and shall terminate at midnight of the 60<sup>th</sup> day thereafter. If the 60<sup>th</sup> day falls on a

statutory holiday, such day, and any subsequent contiguous holidays, shall be omitted from the computation.

- .5 The 60 day acceptance period referred to above may be extended at the Owner's request and subject to the Bidder's written agreement to the extension.
- .6 The Contract shall be established upon the Owner issuing to the successful Bidder, a letter accepting the bid without qualification or, if the letter accepting the bid contains one or more qualifications, upon the Bidder's written acceptance of all such qualifications.
- .7 The lowest or any bid will not necessarily be accepted and the Owner may reject any and all bids.
- .8 The Owner may negotiate contract terms with the Bidder submitting the lowest valid bid, provided that the negotiated changes to the Bid Documents result in either no change to the bid price or a reduced bid price. Such changes may be formalized in the form of a Post-Bid Addendum that, upon written acceptance by the Bidder, shall form part of the Contract Documents.

**8. BID OPENING**

- .1 Bids will be opened on the Online Bidding System immediately after the bid closing time.
- .2 The name of each Bidder and the bid price will be displayed. The displaying of a bid price shall not be considered a representation or warranty that the price is correct or that the bid is valid.

**9. IRREGULARITIES**

- .1 A bid that is informal, incomplete, qualified, non-compliant with the requirements of the Bid Documents, or otherwise irregular in any way, may be declared invalid and rejected.
- .2 The Owner may accept or waive a minor and inconsequential irregularity, or where practicable to do so, the Owner may, as a condition of bid acceptance, request a Bidder to correct a minor and inconsequential irregularity with no change in the bid price.
- .3 The determination of what is, or is not, a minor and inconsequential irregularity, the determination of whether to accept, waive or require correction of an irregularity, and the final determination of the validity of a bid, shall be at the Owner's sole discretion.
- .4 Discrepancies between words and figures will be resolved in favour of words.

**10. SAFETY PREQUALIFICATION**

- .1 Prime contract Bidders should possess a valid Certificate of Recognition (COR) or Temporary Letter of Certification (TLC) as issued by the Alberta Construction Safety Association (ACSA) or another certifying organization authorized to issue CORs.

- .2 Prospective Bidders who do not possess a COR, and wish to obtain information about obtaining a COR or TLC, are advised to contact:

The Alberta Construction Safety Association online at <http://www.youracsa.ca/>.

## **11. AVAILABILITY OF BID DOCUMENTS**

- .1 Bid Documents are available on the Online Bidding System at <https://mpe.bidsandtenders.ca/>.
- .2 A Bid Document deposit is not required.
- .3 The Owner will assume no responsibility or liability for the completeness of any Bid Documents obtained from a source other than the Online Bidding System.

## **12. EXAMINATION OF BID DOCUMENTS AND THE SITE**

- .1 Bidders shall, before submitting a bid:
  - .1 Examine and read the Bid Documents thoroughly,
  - .2 Visit the site and its surroundings and other locations to become familiar with local and other conditions affecting the Work,
  - .3 Consider the effect of regulatory requirements applicable to the Work,
  - .4 Study and correlate Bidder's Site observations with the Bid Documents,
  - .5 Immediately notify the Owner of all perceived omissions and discovered conflicts, errors and discrepancies in the Bid Documents, and
  - .6 Understand the Bid Documents and be competent to undertake and complete the Work.
- .2 Refer to Section 00300 – Information Documents which identifies available information pertaining to the Project and specifies the status of and the extent, if any, to which the Bidder may rely upon such Information Documents.
- .3 Before submitting a bid, each Bidder shall, at the Bidder's expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the conditions at, under, or contiguous with the site, which may affect performance of the Work and which the Bidder deems necessary to determine its bid for performing the Work in accordance with the Bid Documents. Bidders shall obtain the Owner's prior approval for access to the site for the purpose of carrying out any such activities. Bidders shall restore the site to a condition acceptable to the Owner upon completion of such activities.
- .4 Lands upon which Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by the Contractor in performing the Work are identified in the Bid Documents. Additional lands and access thereto required for performance of the Work shall be provided by Contractor.

- .5 When Section 00250 - Pre-Bid Meeting, is included in the Bid Documents, a pre-bid meeting is arranged by the Owner to take place during the bid period. The date and time of the meeting will be indicated on the Online Bidding System.

**13. BID SECURITY**

- .1 Provide and submit the bid security specified in Section 00210 - Bid Security.

**14. CONSENT OF SURETY**

- .1 Provide and submit a Consent of Surety Form in the amount equal to fifty (50%) percent of the Contract sum.

**15. CONTRACT PERFORMANCE SECURITY**

- .1 Provide and include in the bid price for the security specified in Section 00612 - Contract Performance Security.

**16. SECURITY FOR PAYMENT OF CLAIMS**

- .1 Provide and include in the bid price for the security specified in Section 00616 - Security for Payment of Claims.

**17. EVIDENCE OF ABILITY TO PROVIDE SECURITY**

- .1 The Owner may, after the bid submission and before the contract award, require a Bidder to submit evidence of the Bidder's ability to provide the security specified in the Bid Documents.

**18. ALLOWANCES**

- .1 Include in the bid price all allowances specified in Section 01280.

**19. PRODUCT OPTIONS AND SUBSTITUTIONS**

- .1 Product options: Comply with the requirements of Section 01621.
- .2 Substitutions:
  - .1 Comply with the requirements of Section 01621.
  - .2 Where products are specified by a proprietary specification, and substitutions are permitted, Bidders may base their bids on a named product or manufacturer or on unnamed substitutions, subject to the requirements specified for substitutions in Section 01621.
  - .3 During the bid period, it is the sole responsibility of each Bidder to determine whether a substitution meets the requirements specified in Section 01621.

- .4 The Owner will not consider requests for approval of substitutions from Bidders during the bid period.
- .5 Substitutions will be evaluated and approved or rejected by the Owner after the contract award.
- .3 Product Acceptability:
  - .1 The Owner may, after the bid submission and before the contract award, require any Bidder to submit proof that a product proposed for use complies with the requirements of the Bid Documents. Such proof shall be in the form of product data as specified in Section 01621.
  - .2 Should the Owner determine that a proposed product does not meet the requirements of the Bid Documents, the Bidder shall propose a product which, in the Owner's opinion, does meet requirements of Bid Documents, otherwise such Bidder's bid may be declared invalid and rejected.

**20. AGREEMENT**

- .1 The successful Bidder will be required to enter into a formal Agreement with the Owner for the performance of the Work.

**21. DIVISION OF WORK**

- .1 Work specified in the Specifications is divided into Divisions and Sections for reference purposes only. Except as may be otherwise specified in the Bid Documents, the division of the Work among the Contractor, Subcontractors, Sub-subcontractors and suppliers is the Bidders' responsibility.

**22. INTERPRETATION AND MODIFICATION OF BID DOCUMENTS**

- .1 Submit questions about the meaning and intent of the Bid Documents to the Owner at the office identified under "Inquiries". Interpretations and modifications considered necessary by the Owner in response to such questions will be issued by the Owner in writing in the form of an Addendum.
- .2 Addenda may also be issued by the Owner to modify the Bid Documents as deemed necessary by the Owner.
- .3 Submit questions as early as possible in the bid period. The Owner may not respond to questions received too close to the bid closing time to permit issuance of an Addendum.
- .4 Submit inquiries as early as possible in the bid period. If an inquiry requires an interpretation or modification of the Bid Documents, but is received too close to the bid closing time to permit issuance of an Addendum, the Owner may be unable to respond to that inquiry.
- .5 Any replies to inquiries or interpretations or modifications of the Bid Documents made verbally, by e-mail, or by any manner other than in the form of a written Addendum, shall not be binding.

**23. ADDENDA**

- .1 Addenda, when issued, will become part of the Bid and Contract Documents.
- .2 Each Bidder shall ascertain before bid submission, that it has received all Addenda issued by the Owner, and shall indicate in the Bid Form, the Addendum number(s) of all Addenda received.
- .3 During the Bid period, all Addenda issued by the Owner will be published on the Online Bidding System.
- .4 Bidders who have obtained Bid Documents from any another source may not automatically receive addenda.

**24. INQUIRIES**

- .1 Direct inquiries during bid period to:

Eric Dyson, P.L.(Eng.)

MPE Engineering Ltd.  
Suite 300, 714 – 5 Avenue S  
Lethbridge, AB T1J 0V1

Tel: (403) 329-3442  
Email: edyson@mpe.ca

**END OF SECTION**

**1. TYPE AND AMOUNT OF BID SECURITY**

- .1 Provide bid security in the form of a digital bid bond (e-bond) in an amount not less than 10% of the bid price.
- .2 Submit bid security with bid on the Online Bidding System. Bids not accompanied by bid security will be rejected.

**2. BID BONDS**

- .1 Bid bonds shall be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Bid Bond, CCDC Document No. 220.
- .2 Bid bonds shall be issued by a duly incorporated surety company authorized to transact business of suretyship in the Province of Alberta.
- .3 Bid bonds shall be properly electronically executed by both the Bidder and the surety.

**3. DEFAULT BY BIDDER**

- .1 If a Bidder whose bid is accepted by the Owner in writing, without qualification, and within the acceptance period specified in the Bid Documents, refuses or fails within 21 days after the date of issuance of the written acceptance of the bid:
  - .1 To sign a formal Agreement with the Owner for the performance of the Work, and
  - .2 To provide contract performance security, or security for payment of claims, or both, if and as required by the Bid Documents,

the Bidder shall be liable to the Owner for the difference between the amount of its bid and the greater amount for which a contract for the Work is entered into with some other Bidder, up to the maximum amount of the bid security provided.

**END OF SECTION**

**1. PRE-BID MEETING AND SITE INSPECTION**

- .1 A pre-bid meeting and site inspection will be held at the time and place specified on the bids and tenders platform.
- .2 Purpose is to provide bidders an opportunity to familiarize themselves with the Work and with existing conditions. Owner's representative(s) will be present.
- .3 This meeting will be Bidders' only opportunity to inspect the site in the presence of the Owner's Representative.
- .4 Site access is restricted.
- .5 All prime contract and major subcontract Bidders are strongly advised to attend. Others are invited to attend.
- .6 No information provided by the Owner or any of his representatives at the pre-bid meeting and site inspection shall be binding, unless such information is included in an Addendum.

**END OF SECTION**

**1. CONTRACT INFORMATION DOCUMENTS**

- .1 Contract Information Documents listed in 3.1 are incorporated into the Contract.
- .2 The Bidder is entitled to rely upon the factual information or factual data contained in Contract Information Documents, or parts thereof, which have been obtained principally for the purposes of study and design and believed to be correct, within normal limits inherent in gathering such information and data, but the Bidder shall draw its own conclusions from such factual information or factual data and shall not rely on opinions or interpretations contained therein.
- .3 Contract Information Documents shall not be considered a representation or warranty that information contained therein is complete or appropriate for construction.
- .4 Information contained in Contract Information Documents may be time sensitive and dates and times shall be considered when interpreting such information.
- .5 The Bidder is encouraged to obtain specialist advice with respect to Contract Information Documents. The Owner assumes no responsibility for such interpretations and conclusions.

**2. OTHER INFORMATION DOCUMENTS**

- .1 Other Information Documents means information documents not listed in 3.1 herein, and are not part of the Contract Documents.
- .2 The Bidder is not entitled to rely upon the factual information or factual data in any Other Information Documents, nor any opinions or interpretations contained therein. Other Information Document shall not be considered accurate, complete, or appropriate.
- .3 Other Information Documents are made available to the Bidder for the purpose of providing the Bidder with access to the information available to the Owner.

**3. LIST OF CONTRACT INFORMATION DOCUMENTS**

- .1 Contract Information Documents comprise the following:
  - .1 Drawings
  - .2 Specifications

**4. LIST OF OTHER INFORMATION DOCUMENTS**

- .1 The following Other Information Documents are not incorporated into the Contract Documents, but are made available to the Contractor:
  - .1 MPE Geotechnical Report R01 – Drumheller Airport Geotechnical and Pavement Design.

**5. ACCESS TO INFORMATION DOCUMENTS**

- .1 Contract Information Documents and Other Information Documents not issued to Bidders with the Bid Documents are available for examination at:

MPE Engineering Ltd.  
Suite 300, 714 – 5 Avenue S  
Lethbridge, AB T1J 0V1

- .2 Bidders may examine the above documents during normal business hours, 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. daily.

- .3 For an appointment to examine the documents contact:

Eric Dyson, P.L.(Eng.) at:  
(403) 329-3442

- .4 Direct enquiries during the bid period to the person identified in Instructions to Bidders to receive enquiries.

**END OF SECTION**

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- .1 The Schedule of Prices must be completed on the Online Bidding System.

**END OF SECTION**

2450-053-00

**AGREEMENT BETWEEN (Town of Drumheller) AND ( Contractor )**

**This Agreement** made in triplicate on the .....day of ..... 20.....:

**between**

Town of Drumheller, hereinafter called the "Owner"

**and**

.....  
(Name of Contractor)

.....  
(address)

.....  
(city, prov, postal code)

hereinafter called the "Contractor"

**witnesses:** that the parties agree as follows:

**ARTICLE 1: THE WORK**

The Contractor shall perform the Work required by the Contract Documents for:

**Drumheller Municipal Airport (CEG4) Rehabilitation**

and do and fulfill everything required by this Agreement.

**ARTICLE 2: CONTRACT DOCUMENTS**

The Contract Documents referred to in Article 1 of this Agreement shall be as defined in the Contract Documents. Terms used in the Contract Documents which are defined in the Definitions and Interpretation Section shall have the meanings designated therein.

2450-053-00

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**ARTICLE 3: CONTRACT TIME**

The Contractor shall attain Substantial Performance of the Work by the following date:

.....day of ..... 20.....:

The Contractor shall attain Total Performance of the Work by the following date:

.....day of ..... 20.....:

**ARTICLE 4: CONTRACT PRICE**

The Contract Price is ..... dollars

and ..... cents.

(\$.....) in Canadian funds (**GST in**)

**ARTICLE 5: TAXES AND DUTIES**

Unless otherwise stated in the Contract Documents, the Contractor shall pay all government sales taxes, customs duties and excise taxes with respect to the Contract.

Any increase or decrease in costs to the Contractor due to changes in such taxes and duties, after the closing date of the Tender submissions, shall increase or decrease the Contract Price accordingly.

Where an exemption from or recovery of government sales taxes, duties or excise taxes is applicable to the Contract, the procedure shall be as established in the Payment conditions and other applicable provisions in the Contract Documents.

**ARTICLE 6: PAYMENT**

The Owner shall make payment in Canadian funds to the Contractor on account of the Contract Price in accordance with the Payment Conditions and other applicable provisions in the Contract Documents.

The Owner shall hold back an amount equal to 10% from each progress payment as provided for in the Payment Conditions of the Contract Documents.

**ARTICLE 7: RIGHTS AND REMEDIES**

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the Owner or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

**ARTICLE 8: LANGUAGE AND LAW OF THE CONTRACT**

The language of the Contract is English and the Contract shall be construed and interpreted accordingly. The law prevailing in the Province of Alberta, Canada shall govern the interpretation of the Contract.

**ARTICLE 9: SUCCESSION**

The Contract Documents are to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and subject to law and the provisions of the Contract Documents shall ensure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors and permitted assigns.

**ARTICLE 10: NOTICES**

Notices to be given under the Contract shall be addressed to the parties as follows:

**The Owner at:**

Town of Drumheller  
224 Centre Street  
Drumheller, AB  
T0J 0Y4

Telephone: (403) 823-1312

**The Owner's Representative at:**

MPE Engineering Ltd.  
Suite 300, 714 – 5 Avenue S  
Lethbridge, AB  
T1J 0V1

Telephone: (403) 329-3442

**The Contractor at:**

Contractor's Name  
Address  
City, Prov  
Postal Code

Telephone: (xxx) xxx-xxxx

2450-053-00

**In witness whereof** the parties hereto have executed this Agreement under their respective seals and by the hands of their proper officers thereunto duly authorized.

SIGNED, SEALED AND DELIVERED in the presence of:

**CONTRACTOR**

.....  
Company Name

.....  
Signature of Authorized Signing Officer

.....  
Name of Officer Title of Officer

Corporate Seal

**OWNER**

.....  
Town of Drumheller  
Name

.....  
Signature of Authorized Signing Officer

.....  
Name of Officer Title of Officer

Corporate Seal

**END OF SECTION**

**1. DEFINITIONS**

In the Contract, the following terms shall have the meanings assigned to them:

- .1 "Additional Instruction" means a written instruction, issued by the Owner to the Contractor, clarifying or finalizing requirements of the Contract Documents and not involving a change in the Contract Price or the Contract Time.
- .2 "Agreement Form" means the document which, when executed by the Owner and the Contractor, formalizes the Contract.
- .3 "Bid" means the Contractor's priced offer to the Owner for the performance of the Work in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance.
- .4 "Certificate of Total Performance" means the certificate issued by the Owner's Representative, when to the best of his knowledge, information and belief, the entire Work has been performed to the requirements of the Contract Documents, except for defects in the Work not discovered by the Owner's Representative and the making good of faulty workmanship or materials during the maintenance period.
- .5 "Certificate of Warranty Performance" means the certificate issued by the Owner's Representative following a period of twelve (12) months from the date of the Certificate of Substantial Performance, or, if a Certificate of Substantial Performance is not issued, following a period of twelve (12) months from the date of the Certificate of Total Performance, which twelve (12) month period is hereafter referred to as the "maintenance period", certifying that to the best of his knowledge, information and belief the performance of the Work (except for defects in the Work not discovered by the Owner's Representative) has been completed.
- .6 "Change Order" means a written instruction, issued by the Owner to the Contractor on or after the date of execution of the Agreement Form, authorizing or ordering a Change in the Work or a change in the Contract Price or the Contract Time or any combination thereof.
- .7 "Change in the Work" means an addition to, deletion from or other modification of the Work consistent with the scope and intent of the Contract.
- .8 "Construction Equipment" means equipment, appliances and things required for the performance of the Work, but does not include Permanent Work or Temporary Work.
- .9 "Contemplated Change" means a written communication, issued by the Owner to the Contractor on or after the date of execution of the Agreement Form, containing a contemplated Change in the Work and requiring the Contractor to submit a quotation for executing such contemplated change, including the Contractor's proposed changes to either or both the Contract Price or the Contract Time.
- .10 "Contract" means the undertaking by the Owner and the Contractor to perform their respective duties, responsibilities and obligations as prescribed in the Contract Documents and represents the entire agreement between the Owner and the Contractor. The Contract Documents form the Contract.

- .11 "Contract Deficiency" means a deficiency in the Work, or part thereof, for which the Contractor is responsible under the Contract and includes a deficiency in any design for which the Contractor is responsible.
- .12 "Contract Documents" means: - the Letter of Acceptance; - the executed Agreement Form; - Instructions to Bidders, completed Bid Form, Schedule of Prices, and Supplements to Bid Form; - Information Documents specifically incorporated into the Contract Documents; - Definitions and Interpretation, Payment Conditions, Security Conditions, Insurance Conditions, General Conditions, Supplementary Conditions; - the Specifications; - the Drawings; - Addenda; - and such other documents as may be identified as Contract Documents, and shall include amendments thereto made pursuant to the provisions of the Contract.
- .13 "Contract Price" means the total amount payable by the Owner to the Contractor under the Contract as stated in the Agreement Form, including authorized adjustments thereto.
- .14 "Contract Time" means the period of time specified in the Contract for attainment of substantial Performance of the Work, including authorized adjustments thereto.
- .15 "Contractor" means the person, firm or corporation contracting directly with the Owner to perform the Work.
- .16 "Cost Plus Work" means a contractual arrangement that prescribes the cost of the work plus an allowance for overhead and profit, as expressly defined in the Contract, as payment for performance of the item of work to which it relates.
- .17 "Day" means a calendar day.
- .18 "Drawings" means the graphic and pictorial portions of the Contract Documents showing the design, location or dimensions of the Work, generally including plans, elevations, sections, details and diagrams.
- .19 "Engineer" means the person or persons named in these Contract Documents as the Owner's representative. Words importing persons shall include firms, corporations and joint ventures.
- .20 "Information Documents" means information of any type and in any form related to the Project and identified in the Contract Documents as such, but which does not form part of the Contract unless specifically incorporated therein.
- .21 "Invention" means any new and useful practice, process, machine, device, manufacture or composition of matter, or any new and useful improvement thereof.
- .22 "Letter of Acceptance" means the formal acceptance by the Owner of the Contractor's Bid, including any modifications to the Bid agreed to by the Owner and the Contractor and incorporated therein.
- .23 "Lump Sum Work" means a contractual arrangement that prescribes a lump sum as payment for performance of the item of work to which it relates.
- .24 "Online Bidding System" means the Bids&Tenders Online Bidding System available at <https://mpe.bidsandtenders.ca/>.

- .25 "Other Contractor" means any person, firm or corporation employed by or having a separate contract with the Owner for work related to the project other than that required by the Contract Documents.
- .26 "Owner" means the Owner as named elsewhere in these Contract Documents and includes a person acting for, or in place of, the Owner.
- .27 "Owner's Representative" means the employee or Engineer identified in writing by a duly authorized officer to represent the Owner under the Contract.
- .28 "Permanent Work" means any structure, Product or thing constructed, manufactured or installed in the performance of the Work, but does not include Temporary Work.
- .29 "Products" means material, components, elements, machinery, equipment, fixtures, systems and other items forming the Work or part thereof but does not include Construction Equipment. "Products" is synonymous with "Materials".
- .30 "Project" means the total construction of which the Work to be provided under the Contract may be the whole or a part.
- .31 "Regulatory Requirements" means laws, ordinances, rules, regulations, orders, codes, and other legally enforceable requirements in effect and applicable to the performance of the Work.
- .32 "Schedule of Prices" means the completed Schedule of Prices submitted by the Contractor with his Bid, as accepted by the Letter of Acceptance.
- .33 "Site" means the designated Site or location of the Work and any other places as may be specifically designated in the Contract as forming part of the Site.
- .34 "Specifications" means that portion of the Contract Documents comprising Divisions 1 to 16 of the specification format including the General Requirements and technical specifications.
- .35 "Subcontractor" means a person, firm or corporation having a contract with the Contractor for the performance of a part of the Work at the Site.
- .36 "Sub-subcontractor" means a person, firm or corporation having a contract with a Subcontractor for the performance of a part of the Work at the Site.
- .37 "Substantial Performance of the Work" means the time when the prerequisites to Substantial Performance of the Work required by the Contract are fulfilled and the Work is ready for use or is being used for the purpose intended and the state of the work is so declared, in writing, by the Owner.
- .38 "Supplier" means a person, firm or corporation having a contract with the Contractor, a Subcontractor or a Sub-subcontractor for the supply of goods or services to be incorporated into or utilized in the performance of the Work.
- .39 "Temporary Work" means site offices, temporary structures, facilities and controls and other temporary things required for the performance of the Work, but does not include Construction Equipment.

- .40 "Total Performance of the Work" means the time when the prerequisites to Total Performance of the Work required by the Contract are fulfilled and the entire Work, except those items arising from the warranty provisions of the Contract, has been performed to the requirements of the Contract Documents and is so declared, in writing, by the Owner.
- .41 "Unit Price" means the amount payable by the Owner to the Contractor under the Contract for a single unit of each separately identified item of work for which a unit price is prescribed as the basis of payment, as stated in the Schedule of Prices.
- .42 "Unit Price Work" means a contractual arrangement that prescribes the product of a Unit Price multiplied by a number of units of measurement of a class as payment for performance of the item of work to which it relates.
- .43 "Warranty Performance of the Work" means the time when the prerequisites to Warranty Performance of the Work required by the Contract are fulfilled and all items arising from the warranty period or periods required by the Contract have been corrected by the Contractor and the state of the Work is so declared, in writing, by the Owner.
- .44 "Work" means the total construction and related services required by the Contract Documents.

**2. INTERPRETATION**

The Contract shall be interpreted as follows:

- .1 The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all.
- .2 Words importing the singular also include the plural and the masculine includes the feminine and vice-versa where the context requires.
- .3 "Herein", "hereby", "hereof", "hereunder" and similar expressions refer to the Contract as a whole and not to a particular part thereof, unless the context indicates otherwise.
- .4 Words and abbreviations which have well known technical meanings are used in the Contract in accordance with such recognized meanings.
- .5 Words importing persons or parties shall include firms and corporations and any organization having legal capacity.
- .6 In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an", but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.
- .7 The imperative mood is used extensively in the Contract Documents, particularly the Specifications. Such language is always directed to the Contractor, and it is the Contractor's responsibility to perform the Work specified in the imperative mood, unless specifically stated otherwise.

- .8 Unless the context indicates otherwise, where a term is defined in the Contract Documents, other parts of speech or grammatical forms of the same word or expression have corresponding meanings.
- .9 Unless the context indicates otherwise, all monetary amounts shall be interpreted as amounts in the lawful currency of Canada.
- .10 When provision is made for the giving or issue of any notice, consent, approval, certificate or determination by any person, unless otherwise specified, such notice, consent, approval, certificate or determination shall be in writing and the words "notify", "certify" or "determine" shall be construed accordingly. Any such consent, approval, certificate or determination shall not unreasonably be withheld or delayed.
- .11 When provision is made for a communication to be "written" or "in writing" this means any handwritten, typewritten or printed communication, including facsimile transmissions.
- .12 Except in relation to a change in the Contract Time, any period of time in the Contract within which the Owner or the Contractor is to take action or decide anything may be extended by agreement, notwithstanding that the period of time has expired.
- .13 The term "including" or "includes" shall be construed as inclusive and not exclusive, and shall be interpreted to mean including but not necessarily limited to the items referred to.
- .14 In the event of ambiguities, discrepancies and conflicts between the several documents forming the Contract Documents the following order of precedence shall apply:
  - .1 Executed Agreement Form.
  - .2 Letter of Acceptance.
  - .3 Addenda.
  - .4 Supplementary Conditions.
  - .5 Conditions of Contract, including General, Payment, Security and Insurance Conditions.
  - .6 Specifications.
  - .7 Drawings.
  - .8 Drawings of larger scale shall govern over those of smaller scale of the same date.
  - .9 Figured dimensions shown on a Drawing shall govern even though they may differ from dimensions scaled on the same Drawing.

Notwithstanding the foregoing, documents of later date shall always govern over the documents amended.

**END OF SECTION**

**1. TYPE AND AMOUNT OF SECURITY**

- .1 Contractor shall provide security for performance of the Contract in the form of one of the following:
  - .1 Bank Draft or equivalent in the amount of 10% of the Contract Price.
  - .2 Performance Bond for 50% of the Contract Price.
- .2 Security in the form of a bank letter of credit is not acceptable.
- .3 Submit security to the Owner within 21 days after date of issuance of Letter of Acceptance.

**2. BANK DRAFT**

- .1 Bank Drafts shall be drawn on a financial institution authorized to conduct business in the Province of Alberta and shall be made payable to the Owner.
- .2 After receipt Owner will present Bank Drafts to the bank for payment. Contractor shall not be entitled to accrued interest on a Bank Draft provided as security.

**3. SURETY BOND**

- .1 Performance bond shall be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Performance Bond, CCDC Document No. 221. Consign performance bond to the Owner.

**4. RELEASE OF SECURITY**

- .1 When security is in the form of a Bank Draft, such security shall be released progressively as follows:
  - .1 Four months after Substantial Performance of the Work, not more than one third of the amount of the security shall be released to the Contractor.
  - .2 Eight months after Substantial Performance of the Work, a further amount not exceeding one third of the amount of the security shall be released.
  - .3 After the warranty period has expired, the balance of the security shall be released, subject to deficiencies in materials and workmanship arising during the warranty period having been corrected to the Owner's satisfaction.
- .2 Progressive releases of security shall be made upon written request by Contractor.

**END OF SECTION**

**1. TYPE AND AMOUNT OF SECURITY**

- .1 Contractor shall provide security for payment to claimants for labour and material used or reasonably required for use in the performance of the Contract. Such security shall be in the form of one of the following:
  - .1 Bank Draft or equivalent in the amount of 10% of the Contract Price.
  - .2 Labour and Material Payment Bond for 50% of the Contract Price.
- .2 Security in the form of a bank letter of credit is not acceptable.
- .3 Submit security to Owner within 21 days after date of issuance of Letter of Acceptance.

**2. BANK DRAFT**

- .1 Bank Drafts shall be drawn on a financial institution authorized to conduct business in the Province of Alberta and shall be made payable to the Owner.
- .2 After receipt Owner will present Bank Drafts to the bank for payment. Contractor shall not be entitled to accrued interest on a Bank Draft provided as security.

**3. SURETY BOND**

- .1 Labour and Material bond shall be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Labour and Material, CCDC Document No. 222. Consign Labour and Material Bond to the Owner.

**4. RELEASE OF SECURITY**

- .1 When security is provided in the form of a Bank Draft, such security shall be released to Contractor provided:
  - .1 Owner has issued a Certificate of Substantial Performance,
  - .2 Builders Lien Act claims period of 45 days from date of Substantial Performance of the Work has expired,
  - .3 Third party claims received by Owner have been resolved, or addressed and course of action agreed to between Owner and Contractor,
  - .4 Contractor has submitted to Owner, completed Statutory Declaration.

**END OF SECTION**

**1. RELATED REQUIREMENTS**

- .1 Hold Harmless Agreement: General Conditions.

**2. GENERAL REQUIREMENTS FOR INSURANCE**

- .1 Without restricting the generality of the hold harmless provisions of the General Conditions of Contract and without limiting the obligations or liabilities under the Contract, Contractor shall, provide, maintain, and pay for the insurance coverages specified in this Section.
- .2 Form: Insurance policies shall be placed with Insurers, licensed to conduct business in the Province of Alberta, who comply with the Insurance Act (Alberta) and be in forms acceptable to the Owner.
- .3 Duration: Unless otherwise specified, required insurance coverages shall be maintained continuously from date of commencement of the Work until date of Total Performance of the Work.
- .4 Waiver of Recourse and Subrogation: Contractor waives all rights of recourse and subrogation against Owner for damages to Contractor's property.
- .5 Notice of Change to Policy: Each required policy shall be endorsed to provide the Owner with not less than 30 days' advance written notice of cancellation or material change restricting coverage.
- .6 Proof of Insurance: Prior to commencement of any activities on site, Contractor shall provide Owner with proof that insurance coverages are in effect and meet specified conditions. In addition, Contractor shall at any time upon request, promptly file certified true copy of any insurance policy and shall otherwise provide proof of any required insurance, in a form acceptable to the Owner.
- .7 Subcontractors' Insurance: Contractor shall ensure that Subcontractors provide their own General Liability Insurance, Automobile Liability Insurance, where such risks exist, Aircraft and Watercraft Liability Insurance, and Other Insurance equivalent to that specified herein. With respect to General Liability Insurance, Contractor may alternatively provide such insurance on a wrap-up basis insuring himself, his Subcontractors, and anyone employed directly or indirectly by himself or his Subcontractors to perform a part of the Work.

**3. GENERAL LIABILITY INSURANCE**

- .1 General Liability Insurance shall be in the name of the Contractor. The policy shall include the Owner and the Owner's Representative as Additional Insured with respect to liability arising from the Contractor's operations with regard to the work. The limits shall not be less than five million dollars inclusive per occurrence. The insurance coverage shall include at least the following extensions: Premises, Property and Operations; Occurrence basis, Owners/Contractors' protective, Products and Completed Operations; Blanket Contractual; Employees as Additional Insureds; Broad Form Property Damage; Broad Form Loss of Use; Personal Injury; Incidental Malpractice; Contingent Employers' Liability; Cross Liability/Severability of Interests; Non-Owned Automobile Liability

including Endorsement Form 96; Intentional Injury to protect persons or property, X-plate/unlicensed/specially licensed vehicles; Attached Machinery; Voluntary Medical Payments. To achieve the desired limit, umbrella or excess liability insurance may be used. The Policy shall be endorsed to provide the Owner with not less than 30 days' notice in writing in advance of any cancellation or change or amendment restricting coverage.

**4. AUTOMOBILE LIABILITY INSURANCE**

- .1 Automobile Liability Insurance in respect of licensed vehicles shall have limits of not less than five million dollars inclusive per occurrence for bodily injury, death, and damage to property, in the following forms endorsed to provide the Owner with not less than fifteen (15) days' written notice in advance of any cancellation or change or amendment restricting coverage:
  - .1 Standard Owner's Form SPF #1 Automobile Policy providing Third Party Liability and Accident Benefits Insurance and covering licensed vehicles owned or operated by or on behalf of the Contractor.

**5. AIRCRAFT AND WATERCRAFT LIABILITY INSURANCE**

- .1 Aircraft and Watercraft Liability Insurance with respect to owned or non-owned aircraft or watercraft if used directly or indirectly in the performance of the Work, including use of additional premises, shall be subject to limits of not less than two million dollars inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof and limits of not less than one million dollars for Aircraft Passenger Hazard. Such insurance shall be in the form acceptable to the Owner. The policies shall be endorsed to provide the Owner with not less than thirty (30) days' written notice in advance of cancellation, change or amendment restricting coverage.

**6. COURSE OF CONSTRUCTION INSURANCE**

- .1 All Risk Property Insurance shall be in the joint names of the Contractor and the Owner, insuring not less than the sum of the Contract Price and the full value, as stated in the General Requirements, of products that are specified to be provided by the Owner for incorporation into the Work. The insurance coverage shall be maintained continuously until ten (10) days after the date of the Certificate of Total Performance.
- .2 Should the Owner wish to use or occupy part or all of the Work, he shall give thirty (30) days' written notice to the Contractor of the intended purpose and extent for such use or occupancy. Prior to such use or occupancy the Contractor shall notify the Owner in writing of the additional premium cost, if any, to maintain such insurance which shall be at the Owner's expense. If because of such use or occupancy the Contractor is unable to provide coverage, the Owner, upon written notice from the Contractor and prior to such use or occupancy, shall assume the responsibility to provide, maintain and pay for Property Insurance insuring the full value of the Work, as in (a) and (b) above, including coverage for such use or occupancy and the Contractor shall refund to the Owner the unearned premiums applicable to the Contractor's Policies upon termination of coverage.

- .3 The Policies shall provide that, in the event of a loss or damage, payment 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 or damage payment with the Insurers. When the extent of the loss or damage is determined, the Contractor shall proceed to restore the Work. Loss or damage shall not affect the rights and obligations of either party under the Contract except that the Contractor will be entitled to such reasonable extension of time for completion of the Work as the Owner's Representative may decide.
- .4 Payment for Loss or Damage:
- .1 When the property insurance has been obtained by the Contractor in accordance with the requirements of this Section: The Contractor shall be entitled to receive from the payments made by the Insurer the amount of his interest in the restoration of the work. In addition, the Contractor shall be entitled to receive from the Owner (in addition to the amount due under the Contract) the amount in which the Owner's interest in the restoration of the Work has been appraised, such amount to be paid upon receipt of payment or payments from the Insurer in accordance with the Owner's Representative's certificates for payment.
- .2 When the property insurance has been obtained by the Owner pursuant to the terms of the Contract Documents: The Contractor shall be entitled to receive from the payments made by the Insurer the amount of the Contractor's interest in the restoration of the Work. In addition, the Contractor shall be entitled to receive from the Owner (in addition to the amount due under the Contract) the amount in which the owner's interests in the restoration of the Work has been appraised, such amount to be paid as the restoration of the Work proceeds and in accordance with the requirements of Contract Documents.
- .5 The Contractor shall be responsible for deductible amounts under the policies.

**7. CONTRACTORS' EQUIPMENT INSURANCE**

- .1 All Risks Contractors' Equipment Insurance covering construction machinery and equipment owned or rented and used by the Contractor and/or Subcontractors for the performance of the Work, including Boiler Insurance on temporary boilers and pressure vessels, shall be in the form acceptable to the Owner.

**8. OTHER INSURANCE**

- .1 Contractor shall provide, maintain and pay for any additional insurance required to be provided by law, or which he considers necessary to cover risks not otherwise covered by insurance specified in the Contract Documents.

**END OF SECTION**

**1. FEDERAL GOODS AND SERVICES TAX**

- .1 Monies payable by the Owner to the Contractor shall be inclusive of the Federal Goods and Services Tax (GST).

**2. BASIS OF PAYMENT**

- .1 Payment for Lump Sum Work shall be based on the prices in the Contract and, when required by the Contract, the approved schedule of values for such work.
- .2 Payment for Unit Price Work shall be based on the Unit Prices in the Contract.
- .3 Payment for Cost Plus Work shall be based on the cost of such work, as specified herein, plus a fee in the amount of 10% of the cost of such work for the Contractor's overhead and profit except that no fee shall be applied to the cost of Construction Equipment when such cost is based on rates which already include the Contractor's overhead and profit.
- .4 The cost of Cost Plus Work shall be computed as the sum of the following cost elements as applicable to such work:
  - .1 Cost of labour (other than labour costs included in other cost elements) comprised of payroll costs for employees in the direct employ of the Contractor. Such employees shall include the superintendent and foremen at the Site. Payroll costs shall include salary, fringe benefits and statutory charges paid by Contractor. Fringe benefits shall include health care, vacations with pay, sick time allowance, and pension plan, life and disability insurance, dental and medication plan contributions. Statutory charges shall include contributions for Canada Pension Plan, Workers' Compensation, statutory holidays and Unemployment Insurance. Labour rates shall be consistent with rates actually paid for equivalent job classifications in the normal performance of Lump Sum Work or Unit Price Work or, if there are no such equivalencies, under a schedule of job classifications and labour rates agreed upon by the Owner and the Contractor, if possible before labour costs are incurred.
  - .2 Cost of Products supplied and incorporated into Permanent Work, including cost of transportation and storage thereof and Supplier's site services required in connection therewith. Cash discounts shall accrue to the Contractor. Trade discounts, rebates and refunds and returns from sale of surplus Products shall accrue to the Owner.
  - .3 Cost of Construction Equipment:

Cost of Construction Equipment shall be paid at the rates specified in the current edition of the Equipment Rental Rates Guide published by the Alberta Roadbuilders and Heavy Construction Association, hereinafter called the "Rates Guide", subject to the following:

    - .1 Rates specified in the Rates Guide shall be deemed to include all overhead and profit, regardless of whether Construction Equipment is provided by the Contractor, Subcontractors or Sub-subcontractors.

- .2 Rates specified in the Rates Guide shall be deemed to include cost of owning, operating, loading, unloading, assembling, erecting, and dismantling.
  - .3 When applicable rates are not included in the Rates Guide, costs shall be paid at the rates agreed upon by the Owner and the Contractor, if possible before such costs are incurred.
  - .4 Cost of moving Construction Equipment to and from the Site shall not be payable, unless such cost is solely attributable to the Work and is approved as such by the Owner.
  - .5 Except for Construction Equipment traveling under its own power, travel time for Construction Equipment shall not be payable. Unless otherwise approved by the Owner, Construction Equipment shall be moved by the most economical method.
- .5 Cost of Temporary Work, including cost of transportation and maintenance thereof, used and consumed in the performance of the Work and the cost less fair market value of such work used but not consumed which shall remain the property of the Contractor.
- .6 Cost of special services, including the cost of architects, engineers, specifiers, surveyors, testing laboratories and inspection agencies.
- .7 Supplemental costs, including:
- .1 Travel and subsistence costs of Contractor's employees;
  - .2 Statutory charges, including fees, cost of permits and licenses and custom duties;
  - .3 Cost of rights-of-way and other land related costs;
  - .4 Royalty payments and patent license fees;
  - .5 Deposits lost for causes other than the Contractor's fault or negligence.
- .8 Subcontract and Sub-subcontract costs, including payments made by the Contractor to Subcontractors and by Subcontractors to Sub-subcontractors in accordance with the requirements of such contracts. Subcontractors' and Sub-subcontractors' costs and fee for overhead and profit for Cost Plus Work to be performed under such contracts shall be determined in the same manner as the Contractor's cost and fee.
- .9 With respect to Cost Plus Work:
- .1 Costs payable by Owner shall be directly related to or shall have been necessarily and properly incurred in the performance of such work.
  - .2 Overhead shall include the Contractor's costs related to the operation and maintenance of his head office and branch offices, administration at head office and branch offices, general management, legal, audit and accounting services, buying organization, corporate tax, financing and other bank charges, company directors, salaries and other compensation of personnel stationed off-site, design of Construction Equipment and Temporary Work, supervision, planning and scheduling of work, expendable and unexpendable small tools, including maintenance thereof, clean up and recruitment and training of site staff.

- .3 Contractor shall obtain the Owner's prior approval to subcontract or enter into other agreements for Cost Plus Work.
- .4 Costs claimed for delay or extension of the contract will be considered only if the Contractor has clearly demonstrated the work delayed or extended the critical path of the project.
- .5 The Owner may refuse to pay all or part of the cost of any Work item under any cost element, where the item in question was, in the Owner's opinion, unsuitable for the Work performed.

**3. MEASUREMENT FOR PAYMENT**

- .1 Unless otherwise specified in the Contract, the Owner shall measure the Work for the purpose of determining payment to the Contractor in accordance with the measurement provisions of the Contract.

**4. PROGRESS PAYMENTS**

- .1 Prior to Substantial Performance of the Work, the Owner shall make monthly payments to the Contractor.
- .2 Within 7 days after the end of each monthly payment period, the Contractor shall submit to the Owner:
  - .1 Completed Statutory Declaration Form, at and after the second monthly payment period,
  - .2 Workers' Compensation Board verification that the Contractor's account is in good standing,
  - .3 Any data requested by the Owner to assist the Owner to determine the amount due and payable to the Contractor, and
  - .4 For Products stored by the Contractor on the Site for incorporation in Permanent Work but not incorporated in such Work, proof of purchase price and delivery to the Site, along with a statement of the quantity of such Products and the Schedule of Prices item to which the Products relate.
- .3 The Owner shall, within 45 days after the end of each monthly payment period and subject to having received within the time specified any required information referred to in clause 4.2, pay to the Contractor the amount which the Owner determines to be due and payable to the Contractor, up to the end of the monthly payment period in respect of:
  - .1 The value of Work executed;
  - .2 The value of Work executed pursuant to authorized Changes in the Work;
  - .3 The value of Products stored by the Contractor on the Site for incorporation in Permanent Work but not incorporated in such Work;

- .4 Adjustments due to changes in Regulatory Requirements or price fluctuation provisions of the Contract, if applicable;
- .5 Any other amount determined by the Owner; and
- .6 Subject to:
  - .1 any deductions under clause 10;
  - .2 any withholdings under clause 11; and
  - .3 retention of the holdback amount calculated by applying the holdback percentage referred to in clause 5 to the amount payable to the Contractor under clause 4.3 after any deductions and withholdings.
- .4 For Unit Price Work, Owner may, at his discretion, make partial payment based on partial completion of the scope of a single unit of an item of Work.
- .5 If, after receipt of a progress payment from the Owner, the Contractor disagrees with the amount of such payment, such amount shall nevertheless be considered to be correct unless the Contractor, within 7 days after such receipt, notifies the Owner of the respects in which such payment is claimed by him to be incorrect. On receipt of such notice, the Owner shall review the amount of the payment and either confirm or vary it. If the Owner varies the payment, such variance shall be added to the next progress payment.
- .6 Notwithstanding the terms of this clause or any other clause of the Contract, no amount shall be paid by the Owner until the contract security and proof of insurance, if required under the Contract, have been provided by the Contractor.

**5. HOLDBACK**

- .1 The Owner shall hold back the percentage specified in the Agreement Form from each progress payment referred to in clause 4.
- .2 Forty-five (45) days after the date of a Certificate of Substantial Performance, if issued, the Owner will pay to the Contractor, the unpaid balance of holdback moneys then due, provided:
  - .1 Third party claims, received by the Owner pursuant to the Builders' Lien Act or applicable requirements of the Contract have been resolved, or addressed and a course of action agreed to by the Owner and the Contractor,
  - .2 The Contractor has submitted to the Owner, within 7 days after the date of Substantial Performance, a letter of clearance from the Workers' Compensation Board and a completed Statutory Declaration Form,
  - .3 The Contractor has submitted to the Owner, a letter from the Contractor's Surety (if any) approving the release of the holdback,
  - .4 The Contractor has submitted to the Owner, all Record Documents, showing changes as constructed, Operating and Maintenance Manuals, guarantees, warranties, certificates, reports, spare parts and spare material required by the Contract Documents,

- .5 The Contractor has submitted to the Owner, a statement verifying that "all payment quantities on the completed portion of the Contract have been accepted; and all claims, all demands for Extra Work, or otherwise, under or in connection with the completed portion of the Contract have been presented to the Owner's Representative".
- .3 Forty-five (45) days after the date of Total Performance, the Owner will pay to the Contractor, the unpaid balance of holdback moneys then due, provided:
  - .1 Third party claims, received by the Owner pursuant to the Builders' Lien Act or applicable requirements of the Contract have been resolved, or addressed and a course of action agreed to by the Owner and the Contractor,
  - .2 The Contractor has submitted to the Owner, within 7 days after the date of Substantial Performance, a letter of clearance from the Workers' Compensation Board and a completed Statutory Declaration Form,
  - .3 The Contractor has submitted to the Owner, a letter from the Contractor's Surety (if any) approving the release of the holdback,
  - .4 The Contractor has submitted to the Owner, all Record Documents, showing changes as constructed, Operating and Maintenance Manuals, guarantees, warranties, certificates, reports, spare parts and spare material required by the Contract Documents,
  - .5 The Contractor has submitted to the Owner, a statement verifying that "all payment quantities on the completed portion of the Contract have been accepted; and all claims, all demands for Extra Work, or otherwise, under or in connection with the completed portion of the Contract have been presented to the Owner's Representative".

**6. FINAL PAYMENT**

- .1 Upon the accepted date of Total Performance, the Owner will pay to the Contractor the unpaid balance of any monies then due under the Contract, PROVIDED THAT the Owner's Representative may withhold, or on account of subsequently discovered evidence, nullify the whole or any part of any certificate to such an extent as may be necessary to protect the Owner from loss on account of:
  - .1 The Contractor's unsatisfactory prosecution of the Work.
  - .2 Defective or damaged Work requiring correction or replacement.
  - .3 Claims or liens filed or reasonable evidence indicating the probable filing of claims or liens.
  - .4 Failure of the Contractor to make payments promptly to subcontractors or for materials or labour.
  - .5 A reasonable doubt that the Contract can be completed for balance unpaid.

- .6 Damage to an Other Contractor's Work which has not been settled which may result in the Other Contractor whose Work has been damaged bringing action against the Owner. In case of action, the Contractor will bear the expense of same.
- .7 When the above conditions are resolved to the satisfaction of the Owner, payment shall be made for the amounts withheld because of them.
- .2 If the final statement is considered by the Contractor to be incorrect, the Contractor shall submit to the Owner a notice of claim, including substantiation, notwithstanding the time provisions of clause 10 of the General Conditions.
- .3 If the Owner does not receive a notice of claim pursuant to clause 6.2 within the time specified, the final statement shall be considered correct.
- .4 The final payment shall represent full and final settlement of all monies due to the Contractor pursuant to the Contract except with respect to unresolved claims, if any.

**7. OWNER'S LIABILITY**

- .1 After the final payment issued has been made, the Owner shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract, except as may be provided elsewhere in the Contract, unless the Contractor shall have made a claim in respect therefore prior to or within the time specified in the Builders' Lien Act.

**8. DELAY IN MAKING PAYMENT**

- .1 In respect of progress payments, payment after Substantial Performance of the Work, payment of holdback, and final payment, the Owner shall pay the Contractor an amount that the Owner considers to be due to the Contractor, pursuant to the Contract, within the time specified.

**9. RIGHT OF SET-OFF**

- .1 Without limiting any right of set-off, deduction or recovery given or implied by law or elsewhere in the Contract, the Owner may set off any amount payable to the Owner by the Contractor, or recoverable from the Contractor by the Owner, under the Contract or under any other current contract against any amount payable to the Contractor under this Contract.
- .2 For the purposes of these Payment Conditions, "other current contract" means a contract between the Owner and the Contractor under which the Contractor has an undischarged obligation to perform or supply work, labour, or material, or in respect of which the Owner has, since the date of execution of the contract agreement, exercised any right to take the work that is the subject of the contract out of the Contractor's hands.

**10. DEDUCTIONS FROM PAYMENTS**

- .1 Owner may deduct from any amount claimed by or payable to Contractor:
  - .1 An amount at least equal to the value, as determined by Owner, of Work not in accordance with Contract Documents,
  - .2 The amount of any unresolved third party claim submitted pursuant to the Builders' Lien Act or applicable requirements of the Contract,
  - .3 The amount of any unpaid and overdue statutory account related to the Contract and of which the Owner has received notice and which is enforceable against the Owner,
  - .4 The amount of any overpayment made by the Owner to the Contractor, and
  - .5 Any other amount recoverable by the Owner from the Contractor under the Contract.

**11. WITHHOLDING OF PAYMENT**

- .1 Owner may withhold all or part of any amount payable to Contractor in order to protect the Owner or third parties from loss due to Contractor's:
  - .1 Failure to make payments properly to Subcontractors or for labour, materials or equipment,
  - .2 Failure to ensure that Subcontractors make payments properly to Sub-subcontractors or for labour, materials or equipment,
  - .3 Inability to complete the Work within the Contract Time,
  - .4 Inability to complete the Work for the unpaid balance of the Contract Price,
  - .5 Persistent failure to perform the Work in accordance with the Contract Documents.
- .2 When the causes for withholding payment pursuant to 11.1 are removed to the Owner's satisfaction, the Owner shall pay the Contractor the amount previously due and payable with the next progress payment.

**12. TITLE TO AND ACCEPTANCE OF WORK**

- .1 Contractor warrants that title to work and Products covered by any payment made by the Owner to the Contractor will pass to the Owner, at the time of payment, free and clear of all claims, interests and encumbrances.
- .2 Contractor further warrants that Products stored at the Site and for which payment has been received, shall not be removed from the Site and shall be kept secure and protected.

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- .3      Payments made by Owner shall not be construed as an acceptance that the Work, Products, or any part thereof is complete, is satisfactory or is in accordance with the Contract Documents.

**END OF SECTION**

# Statutory Declaration of Payment Distribution

## Identification of Contract

Contract Name (location and description of the Work as it appears in the Contract Documents)

Date of This Application for Payment
Month Day Year
Date of Last (Immediate Preceding) Application for Payment
Month Day Year

## Identification of Declarant (person making the declaration)

Full Name of Declarant	Position or Title (of office held with Contractor)		
Business Name (Name of Contractor)			
Business Address			
City or Town	Province	Postal Code	

## Declaration

I, the undersigned, solemnly declare that as of the date of this application for payment:

- .1 all the Contractor's lawful obligations to subcontractors and suppliers, in respect of work contracted for and performed before the date of the last (immediate preceding) application for payment, are fully discharged, except for (i) hold back monies properly retained, and (ii) payments deferred by agreement;
- .2 all the Contractor's lawful obligations to workers, in respect to work contracted for, are fully discharged;
- .3 all assessments and payments required to be made by the Contractor under law have been made in full; and that
- .4 I am an authorized signing officer of the Contractor and have personal knowledge of the contract identified and the facts stated in this statutory declaration.

I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

**Making a false or fraudulent declaration is a contravention of the Criminal Code of Canada, and could carry, upon conviction, penalties including fines, imprisonment, or both.**

\_\_\_\_\_

Signature of declarant

## Attestation (to be completed by a person empowered to receive declarations, e.g. Commissioner of Oaths, Notary Public, etc.)

DECLARED before me at _____ this _____ day of _____ 20 _____		
City/Town and Province		
_____	_____	_____
Signature of person before whom declaration is made	Authority to receive solemn declarations	Expiry date
_____	<b>Any changes or corrections on this Statutory Declaration must be initialed by the person before whom the declaration is made.</b>	
Name (please print)		

<b>1.</b>	<b>OWNER AND OWNER'S REPRESENTATIVE</b>	<b>4.10</b>	Owner's Responsibilities for Safety
		<b>4.11</b>	Care of Work
		<b>4.12</b>	Responsibility to Rectify Loss or Damage
<b>1.1</b>	Owner's Duties and Authority	<b>4.13</b>	Hold Harmless Agreement
<b>1.2</b>	Owner's Representative	<b>4.14</b>	Regulatory Requirements
<b>1.3</b>	Appointment of Assistants	<b>4.15</b>	Artifacts and Fossils
<b>1.4</b>	Instructions in Writing	<b>4.16</b>	Patent Rights
<b>1.5</b>	Owner Interpreter of Contract	<b>4.17</b>	Royalties
<b>1.6</b>	Owner's Determinations	<b>4.18</b>	Other Contractors
<b>1.7</b>	Owner's Review	<b>4.19</b>	Permanent Work Designed by Contractor
<b>2.</b>	<b>ASSIGNMENT, SUBCONTRACTING AND NOMINATION</b>	<b>4.20</b>	Records and Audit
		<b>4.21</b>	Record of Labour and Construction Equipment
<b>2.1</b>	Assignment	<b>4.22</b>	Customs
<b>2.2</b>	Subcontracting	<b>4.23</b>	Urgent Remedial Work
<b>2.3</b>	Nominated Subcontractors and Suppliers		
<b>3.</b>	<b>DOCUMENTS</b>	<b>5.</b>	<b>QUALITY OF PRODUCTS AND WORK</b>
		<b>5.1</b>	Products and Workmanship
<b>3.1</b>	Property and Use of Contract Documents	<b>5.2</b>	Cost of Samples
<b>3.2</b>	Reporting of Conflicts, Errors and Discrepancies	<b>5.3</b>	Cost of Tests Provided For
<b>3.3</b>	Disruption of Progress	<b>5.4</b>	Cost of Tests Not Provided For
<b>3.4</b>	Additional Instructions	<b>5.5</b>	Inspection and Testing
<b>3.5</b>	Forms	<b>5.6</b>	Dates for Inspection and Testing
<b>4.</b>	<b>GENERAL OBLIGATIONS</b>	<b>5.7</b>	Rejection
		<b>5.8</b>	Cost for Inspection and Testing
<b>4.1</b>	Contractor's Responsibilities	<b>5.9</b>	Independent Inspection
<b>4.2</b>	Contract Security	<b>5.10</b>	Examination of Work Before Covering Up
<b>4.3</b>	Site Operations and Methods of Construction	<b>5.11</b>	Uncovering and Making Openings
<b>4.4</b>	Differing Physical Conditions or Obstructions	<b>5.12</b>	Removal of Improper Work or Products
<b>4.5</b>	Climatic and Weather Conditions		
<b>4.6</b>	Contractor's Superintendence		
<b>4.7</b>	Contractor's Employees		
<b>4.8</b>	Owner May Object		
<b>4.9</b>	Safety, Security and Protection of the Environment		

**6. COMMENCEMENT, COMPLETION, CONTRACT TIME AND DELAYS**

- 6.1 Commencement of Work
- 6.2 Possession of Site and Access to Site
- 6.3 Contract Time
- 6.4 Extension of Contract Time
- 6.5 Contractor to Provide Notification and Details
- 6.6 Interim Determination of Extension of Time
- 6.7 Rate of Progress
- 6.8 Substantial Performance of the Work
- 6.9 Substantial Performance of Part or Parts of Work
- 6.10 Total Performance of the Work
- 6.11 Warranty Performance of the Work
- 6.12 Acceleration
- 6.13 Damages for Delay
- 6.14 COVID-19 Pandemic Response and Mitigation

**7. WARRANTY**

- 7.1 Warranty Period
- 7.2 Completion of Outstanding Work
- 7.3 Remedying Defects
- 7.4 Contractor's Failure to Carry Out Instructions
- 7.5 Contractor to Search

**8. CHANGES AND VARIATIONS**

- 8.1 Changes in the Work
- 8.2 Instructions for Changes in the Work
- 8.3 Valuation of Changes in the Work
- 8.4 Impact of Changes in the Work
- 8.5 Quantity Variations

**9. CHANGES IN COST AND REGULATORY REQUIREMENTS**

- 9.1 Increase or Decrease in Cost
- 9.2 Changes in Regulatory Requirements

**10. CLAIMS**

- 10.1 Notice of Claims
- 10.2 Contemporary Records
- 10.3 Substantiation of Claims
- 10.4 Payment of Claims
- 10.5 Obligations to and Claims of Third Parties
- 10.6 Claims Against Owner Only

**11. RELEASE FROM PERFORMANCE**

- 11.1 Frustration
- 11.2 Removal of Construction Equipment on Termination
- 11.3 Payment if Contract Terminated

**12. SUSPENSION AND TERMINATION BY OWNER**

- 12.1 Suspension of Work
- 12.2 Owner's Determination Following Suspension
- 12.3 Suspension Lasting More Than 91 Days
- 12.4 Termination of Contract

**13. DEFAULT OF CONTRACTOR**

- 13.1 Default
- 13.2 Valuation at Date of Termination
- 13.3 Payment After Termination
- 13.4 Assignment of Benefit of Agreement

**14. DEFAULT OF OWNER**

- 14.1 Failure of Owner to Pay
- 14.2 Removal of Construction Equipment
- 14.3 Payment on Termination
- 14.4 Contractor May Suspend Work
- 14.5 Resumption of Work

**15. SETTLEMENT OF DISPUTES**

- 15.1** Disputes
- 15.2** Notice of Dispute
- 15.3** Negotiated Settlement
- 15.4** Mediation
- 15.5** Arbitration

**1. OWNER AND OWNER'S REPRESENTATIVE**

**1.1 OWNER'S DUTIES AND AUTHORITY**

- .1 The Owner shall carry out the duties and exercise the authority specified in the Contract.

**1.2 OWNER'S REPRESENTATIVE**

- .1 The Owner shall appoint a representative, who shall, unless the Contractor is expressly advised otherwise by the Owner, have full authority to act on behalf of and bind the Owner under the Contract.

**1.3 APPOINTMENT OF ASSISTANTS**

- .1 The Owner's Representative may appoint any number of persons to assist him in carrying out his duties. He shall notify the Contractor of the names, duties and scope of authority of such persons.
- .2 The failure of any assistants appointed pursuant to clause 1.3.1 to disapprove any work shall not prejudice the authority of the Owner to disapprove such work and to give instructions for the rectification thereof.

**1.4 INSTRUCTIONS IN WRITING**

- .1 The Contractor shall take instructions only from the Owner or any assistants appointed pursuant to clause 1.3. Instructions given by the Owner shall be in writing, provided that if the Owner considers it necessary to give any instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Owner, whether before or after the carrying out of the instruction, shall be deemed to be an instruction within the meaning of this clause. Provided that if the Contractor, within 7 days, confirms in writing to the Owner any oral instruction of the Owner and such confirmation is not contradicted in writing within 7 days by the Owner, it shall be deemed to be an instruction of the Owner.

**1.5 OWNER INTERPRETER OF CONTRACT**

- .1 The Owner in the first instance shall be the interpreter of the Contract and the judge of the Contractor's performance.

**1.6 OWNER'S DETERMINATIONS**

- .1 When the Owner is required to exercise his discretion by giving his decision, opinion or consent, or expressing his satisfaction or approval, or determining value, or otherwise taking action which may affect the rights and obligations of the Contractor he shall exercise such discretion within the terms of the Contract after due consultation with the Contractor and shall promptly notify the Contractor of such decision, opinion, consent, approval or determination.

**1.7 OWNER'S REVIEW**

- .1 Any review, comment, consent, acceptance or approval, or lack thereof, by the Owner, shall not relieve the Contractor of any of its responsibilities or liabilities under the Contract.

**2. ASSIGNMENT, SUBCONTRACTING AND NOMINATION**

**2.1 ASSIGNMENT**

- .1 The Contractor shall not assign the Contract, either in whole or in part, without the previous written consent of the Owner, which consent, notwithstanding other provisions of the Contract, shall be at the Owner's sole discretion.
- .2 The Owner shall not be bound by any assignment by the Contractor of any monies payable or to become payable to the Contractor under the Contract, without the written consent of the Owner, which consent:
  - .1 Will not be given for a general assignment of book debts, but
  - .2 May, at the Owner's sole discretion, be given for a specific assignment of all or part of monies payable to the Contractor under the Contract, subject however, in all cases, to the provisions of the Financial Administration Act (Alberta).

**2.2 SUBCONTRACTING**

- .1 The Contractor:
  - .1 Shall not sublet the Contract as a whole,
  - .2 Shall not subcontract any part of the Work without the Owner's prior consent, which shall not be unreasonably withheld,
  - .3 Shall provide such details of any Subcontractor he wishes to engage as the Owner may require,
  - .4 Shall contract with those Subcontractors proposed by him and accepted by the Owner and such Subcontractors shall not be changed without the Owner's prior consent.
- .2 The Owner may, for reasonable cause, object to the use of a proposed Subcontractor and require the Contractor to contract with another Subcontractor.
- .3 If the Owner requires a change from a proposed Subcontractor, the Contract Price shall be adjusted by any difference in cost and markup occasioned by such required change, except where such change is required due to the Contractor's default or negligence, in which case there shall be no change in the Contract Price.
- .4 The Owner may, upon reasonable request and at his discretion, provide to a Subcontractor information as to the percentage or quantity of the Subcontractor's work for which payment has been approved.
- .5 Nothing contained in the Contract shall create a contractual relationship between a Subcontractor and the Owner and subcontracting part of the Work shall not relieve the

Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any Subcontractor, his agents, servants or workers as fully as if they were his own.

- .6 The Contractor shall enter into contracts or written agreements with his Subcontractors to require them to perform their work in accordance with the Contract, and the Contractor shall incorporate the terms and conditions of the Contract Documents, to the extent that they apply, into all subcontracts.

### **2.3 NOMINATED SUBCONTRACTORS AND SUPPLIERS**

- .1 A nominated Subcontractor or nominated Supplier means a person, firm or corporation with whom the Contract requires the Contractor to enter into a contract for the performance of a subcontract or the supply of things related to the Work.
- .2 Nothing contained in the Contract shall create a contractual relationship between the Owner and a nominated Subcontractor or nominated Supplier and such nomination shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any nominated Subcontractor or nominated Supplier, his agents, servants or workers as fully as if they were his own.

## **3. DOCUMENTS**

### **3.1 PROPERTY AND USE OF CONTRACT DOCUMENTS**

- .1 The Contract Documents are the sole property of the Owner and unless it is necessary for the purposes of the Contract, the Contract Documents shall not, without the consent of the Owner, be used by or communicated to a third party by the Contractor.

### **3.2 REPORTING OF CONFLICTS, ERRORS AND DISCREPANCIES**

- .1 If the Contractor finds a conflict, error or discrepancy in the Contract Documents, the Contractor shall so report to the Owner in writing at once and, before proceeding or continuing with the Work affected thereby, shall obtain a written interpretation or clarification from the Owner; however, the Contractor shall not be liable to the Owner for failure to report any conflict, error or discrepancy in the Contract Documents unless the Contractor had actual knowledge thereof or should reasonably have known thereof.
- .2 The Contractor shall obtain from the Owner any dimensions required but not indicated in figures in the Contract Documents nor calculable from figures in the Contract Documents. Scaling of Drawings, for any purpose, shall be at the Contractor's risk.

### **3.3 DISRUPTION OF PROGRESS**

- .1 The Contractor shall notify the Owner when planning or execution of the Work is likely to be delayed or disrupted unless any further document or instruction required of the Owner under the Contract is issued by the Owner within a reasonable time. The notice shall include details of the document or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.
- .2 If, by reason of any failure or inability of the Owner to issue, within a reasonable time, any document or instruction for which notice has been given by the Contractor in accordance

with clause 3.3.1, the Contractor suffers delay or incurs costs then the Owner shall determine:

- .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
- .2 The amount of such costs, which shall be added to the Contract Price.
- .3 If the failure or inability of the Owner to issue any documents or instruction is caused in whole or in part by the failure of the Contractor to submit documents, which he is required to submit under the Contract, the Owner shall take such failure by the Contractor into account when making his determination pursuant to clause 3.3.2.

### **3.4 ADDITIONAL INSTRUCTIONS**

- .1 The Owner shall have authority to issue to the Contractor, from time to time, such Additional Instructions as may be necessary for the proper performance of the Work. The Contractor shall carry out and be bound by such Additional Instructions.

### **3.5 FORMS**

- .1 Forms to be used pursuant to the Contract or as otherwise may be required for the administration of the Contract shall be as prescribed or approved by the Owner.

## **4. GENERAL OBLIGATIONS**

### **4.1 CONTRACTOR'S RESPONSIBILITIES**

- .1 The Contractor shall, with due care and diligence, design, to the extent provided for by the Contract, execute and complete the Work and remedy any defects therein in accordance with the provisions of the Contract. This shall include the provision of superintendence, labour, Products, Construction Equipment, Temporary Work and all other things, whether of a temporary or permanent nature, required in and for such design, execution, completion and remedying of any defects. The Contractor shall comply with and adhere strictly to the Owner's instructions on any matter, whether mentioned in the Contract or not, concerning the Work.

### **4.2 CONTRACT SECURITY**

- .1 The Contractor shall, if required by the Bid Documents, provide either or both contract performance security or security for payment of claims for labour and material.
- .2 Surety bonds shall be issued by a duly incorporated surety company authorized to transact business of suretyship in the Province of Alberta.
- .3 The Owner may, for reasonable cause, object to use of the surety company proposed by the Contractor, and may require the Contractor to provide a surety bond issued by another surety company acceptable to the Owner, with no change in Contract Price.

**4.3 SITE OPERATIONS AND METHODS OF CONSTRUCTION**

- .1 The Contractor shall be fully responsible for the adequacy, stability and safety of all Site operations and methods of construction.
- .2 The Contractor shall submit at such times and in such detail as the Owner may require such information pertaining to the methods of construction (including Temporary Work and the use of Construction Equipment) which the Contractor proposes to use and such calculations of stresses, strains and deflections that will arise, in the Permanent Work or any part thereof, from the use of such methods during execution of the Work.
- .3 The Owner shall, on request from the Contractor, provide to the Contractor such design criteria relevant to the Permanent Work or any Temporary Work designed by the Owner as may be necessary to enable the Contractor to comply with clause 4.3.2.
- .4 For the purposes of this clause, "method of construction" means a method, means, technique, sequence or procedure of construction.

**4.4 DIFFERING PHYSICAL CONDITIONS OR OBSTRUCTIONS**

- .1 If, during the execution of the Work, the Contractor encounters physical obstructions or physical conditions, including sub-surface obstructions or conditions, other than weather conditions or conditions due to weather conditions, on the Site, which, in his opinion, differ substantially from those indicated in the Contract and which were not reasonably foreseeable, the Contractor shall as soon as possible give notice thereof to the Owner. On receipt of such notice, the Owner shall, if in his opinion such obstructions or conditions differ substantially from those indicated in the Contract Documents and could not have been reasonably foreseen, determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount of any costs, valued in accordance with clause 8.3, which may have been incurred by the Contractor by reason of such obstructions or conditions having been encountered, which shall be added to the Contract Price.
- .2 A determination by the Owner pursuant to clause 4.4.1 shall take account of:
  - .1 The time of the Contractor's notice to the Owner of a differing physical condition or obstruction,
  - .2 Any instruction which the Owner may have issued to the Contractor in connection therewith, and
  - .3 Any proper and reasonable measures acceptable to the Owner, which the Contractor may have taken in the absence of specific instructions from the Owner.

**4.5 CLIMATIC AND WEATHER CONDITIONS**

- .1 The relevant climatological records and related information published by the Canadian Climate Centre of Environment Canada, for one or more locations in the vicinity of the Site, shall be used as a basis for any evaluations and determinations concerning climate and weather.

**4.6 CONTRACTOR'S SUPERINTENDENCE**

- .1 The Contractor shall provide all necessary superintendence during the execution of the Work and as long thereafter as the Owner may consider necessary for the proper fulfilling of the Contractor's obligations. The Contractor, or a competent and authorized representative approved of by the Owner, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the Work. Such authorized representative shall receive, on behalf of the Contractor, instructions from the Owner.
- .2 If approval of the Contractor's representative is withdrawn by the Owner, the Contractor shall, as soon as is practicable, after receiving notice of such withdrawal, remove the representative from the Work and shall not employ him again on the Work in any capacity and shall replace him by another representative approved by the Owner.

**4.7 CONTRACTOR'S EMPLOYEES**

- .1 The Contractor shall provide on the Site in connection with the execution and completion of the Work and the remedying of any defects therein:
  - .1 Technical assistants who are skilled and experienced in their respective trades and such foremen and others as are competent to give proper superintendence of the Work, and
  - .2 Labour as is necessary for the proper and timely fulfilling of the Contractor's obligations.

**4.8 OWNER MAY OBJECT**

- .1 The Owner may object to and require the Contractor to remove forthwith from the Site any person who, in the opinion of the Owner, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence is otherwise considered by the Owner to be undesirable, and such person shall not be allowed on the Site without the consent of the Owner.

**4.9 SAFETY, SECURITY AND PROTECTION OF THE ENVIRONMENT**

- .1 The Contractor shall, throughout the execution of the Work and the remedying of any defects therein:
  - .1 Have full regard for the health and safety of all persons upon the Site and keep the Site and the Work, to the extent that they are under his control, in an orderly state appropriate to the avoidance of danger to such persons, and
  - .2 Provide and maintain at his own cost all temporary facilities and controls when and where necessary or required by the Owner or by any duly constituted authority, for the protection of the Work or for the safety and convenience of the public or others, and
  - .3 Take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or any other causes arising as a consequence of his methods of operation.

- .2 The Contractor shall appoint a person at the Site who shall manage an accident prevention program. This person shall be Contractor's superintendent unless another person is appointed and approved by the Owner.

**4.10 OWNER'S RESPONSIBILITIES FOR SAFETY**

- .1 If under clause 4.18 the Owner carries out work on the Site with his own workers he shall, in respect of such work and subject to clause 4.9:
  - .1 Have full regard to the safety of all persons upon the Site, and
  - .2 Keep the Site in an orderly state appropriate to the avoidance of danger to such persons.
- .2 If under clause 4.18 the Owner contracts with Other Contractors on the Site he shall require them to have the same regard for safety and avoidance of danger.

**4.11 CARE OF WORK**

- .1 The Contractor shall take full responsibility for the care of the Work from the date of commencement of Work at the Site until the date of issue of the Certificate of Substantial Performance of the Work, when the responsibility for such care shall pass to the Owner, provided that:
  - .1 Except where otherwise specified in the Contract, if the Owner accepts a Certificate of Substantial Performance for part of the Permanent Work the Contractor shall cease to be liable for the care of that part from the date of issue of such certificate, then the responsibility for the care of that part shall pass to the Owner, and
  - .2 The Contractor shall take full responsibility for the care of any outstanding Work which he undertakes to finish during the warranty period until such outstanding Work has been completed.

**4.12 RESPONSIBILITY TO RECTIFY LOSS OR DAMAGE**

- .1 If there is any loss or damage to the Work, or any part thereof, or to Products for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, the Contractor shall, at his own cost, rectify such loss or damage so that the Work conforms with the provisions of the Contract to the satisfaction of the Owner. The Contractor shall also be liable for any loss or damage to the Work occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under the warranty provisions of the Contract.

**4.13 HOLD HARMLESS AGREEMENT**

- .1 The Contractor shall hold harmless the Owner from any and all third party claims, demands, or actions for which the Contractor is legally responsible, including those arising out of negligence, willful harm, or crimes by the Contractor or the Contractor's employees or agents. This hold harmless shall survive the Contract.

**4.14 REGULATORY REQUIREMENTS**

- .1 The Contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provisions of:
  - .1 Any Regulatory Requirements, and
  - .2 The rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Work, and the Contractor shall keep the Owner indemnified against all penalties and liability of every kind for breach of any such provisions.
- .2 The Owner shall be responsible for obtaining any planning, zoning or other similar permission required for the Project to proceed.
- .3 Without limiting the Contractor's obligations under clause 4.14.1, the Contractor shall:
  - .1 Comply with all requirements of and pay all fees in connection with the Workers' Compensation Act (Alberta),
  - .2 Comply with the Occupational Health and Safety Act (Alberta) and all safety requirements as contained in the regulations thereto,
  - .3 Ensure that wages, hours of work and other conditions of employment of all persons employed by the Contractor in the performance of any work required by the Contract are in compliance with the requirements of the Employment Standards Code (Alberta), the Labour Relations Code (Alberta) and any other applicable law, rule, regulation or order, and
  - .4 Pay all fees and charges levied by a municipal authority in respect of applicable permits and licences.

**4.15 ARTIFACTS AND FOSSILS**

- .1 Coins, fossils, artifacts, structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Owner and the Contractor, be deemed to be the property of the Owner. The Contractor shall take reasonable precautions to prevent his workers or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, inform the Owner of such discovery and carry out the Owner's instructions for dealing with same. If, by reason of such instructions, the Contractor suffers delay or incurs costs then the Owner shall determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount of such costs, which shall be added to the Contract Price.

**4.16 PATENT RIGHTS**

- .1 The Contractor shall indemnify the Owner from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of any Product, Construction Equipment, Temporary Work or other thing used for or in connection with or for incorporation in the Work and from and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, except where such infringement results from compliance with the design or specification provided by the Owner.

**4.17 ROYALTIES**

- .1 Except as otherwise provided in the Contract, the Contractor shall be liable for all tonnage and other royalties, rent and other payments or compensation, if any, for obtaining stone, sand, gravel, clay or other materials required for the Work.
- .2 The Contractor shall be liable for all payments or other compensation, if any, levied in relation to the dumping of all or part of any waste materials.

**4.18 OTHER CONTRACTORS**

- .1 The Contractor shall, in accordance with the requirements of the Owner, afford all reasonable opportunities for carrying out their work to:
  - .1 Any Other Contractors of the Owner and their workers,
  - .2 The workers of the Owner, and
  - .3 The workers of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the Owner may enter into in connection with or ancillary to the Work.
- .2 Pursuant to clause 4.18.1 and except as may be provided in the Contract, the Contractor shall, on the request of the Owner:
  - .1 Make available to any person referred to in clause 4.18.1, any roads or ways for the maintenance of which the Contractor is responsible, or
  - .2 Permit the use, by any such persons, of Temporary Work or Construction Equipment on the Site, or
  - .3 Provide any other service for any such person, the Owner shall determine an addition to the Contract Price in accordance with clause 8.3.

**4.19 PERMANENT WORK DESIGNED BY CONTRACTOR**

- .1 Where the Contract provides that part of the Permanent Work shall be designed by the Contractor, he shall submit to the Owner, for review:
  - .1 Such drawings, specifications, calculations and other information as is necessary for the Owner's review, and

- .2 Operation and maintenance manuals, as applicable, together with drawings of the Permanent Work as completed, in sufficient detail to enable the Owner to operate, maintain, dismantle, reassemble and adjust the Permanent Work incorporating that design, and such design and any alterations thereto shall be performed by a qualified design professional licensed to practice in Alberta.
- .2 The Contractor shall not commence any work to which the information referred to in clause 4.19.1 relates unless such information has been reviewed by the Owner, and the Contractor shall not thereafter alter such design without the Owner's review.

**4.20 RECORDS AND AUDIT**

- .1 With respect to Cost Plus Work, the Contractor shall:
  - .1 Keep accurate records of estimated and actual costs, payments made and time spent;
  - .2 Keep record copies of bids, quotations, contracts, correspondence, invoices, receipts and vouchers related thereto;
  - .3 Make such records available for inspection and audit by the Owner for a period of at least 2 years after the date of Total Performance of the Work;
  - .4 Provide the Owner with copies and extracts therefrom when requested by the Owner; and
  - .5 Afford facilities for audit and inspection by the Owner at mutually agreeable times and places.
- .2 The Contractor shall cause Subcontractors and other persons directly or indirectly controlled by or affiliated with the Contractor and persons directly or indirectly having control of the Contractor to comply with clause 4.20.1 as if they were the Contractor.

**4.21 RECORD OF LABOUR AND CONSTRUCTION EQUIPMENT**

- .1 The Contractor shall, if required by the Owner, deliver to the Owner a record in detail, in such form and at such intervals as the Owner may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such information respecting Construction Equipment as the Owner may require.

**4.22 CUSTOMS**

- .1 With respect to the importation and re-export of Construction Equipment, Temporary Work, Products and other things required for the Work, the Contractor shall:
  - .1 Be liable for all applicable customs, import duties, taxes and brokerage fees, and
  - .2 Be responsible for obtaining clearance through Customs. If requested by the Contractor, the Owner may assist in obtaining such clearance.

**4.23 URGENT REMEDIAL WORK**

- .1 If, due to any accident, or failure, or other event occurring to, in, or in connection with the Work, or any part thereof, either during the execution of the Work, or during the warranty period, any remedial or other work is, in the opinion of the Owner, urgently necessary for the safety of the Work, persons or property and the Contractor is unable or unwilling at once to do such work, the Owner may employ other persons or contract with other firms or corporations to carry out such work as the Owner may consider necessary.
- .2 If the work or repair done by the Owner pursuant to clause 4.23.1 is work which, in the opinion of the Owner, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon or incidental thereto shall be determined by the Owner and shall be recoverable from the Contractor by the Owner.

**5. QUALITY OF PRODUCTS AND WORK**

**5.1 PRODUCTS AND WORKMANSHIP**

- .1 Products and workmanship shall be:
  - .1 Of the respective kinds described in the Contract, and
  - .2 Subjected from time to time to such tests as the Owner may require at the place of manufacture, fabrication or preparation, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places.
- .2 The Contractor shall:
  - .1 At his cost provide all things necessary for examining, measuring, and testing Products including labour, electricity, fuels, stores, apparatus and instruments, and
  - .2 Supply samples of materials, before incorporation in the Work, for testing as may be selected and required by the Owner.

**5.2 COST OF SAMPLES**

- .1 All samples shall be supplied by the Contractor at his own cost if the supply thereof is provided for in the Contract.

**5.3 COST OF TESTS PROVIDED FOR**

- .1 The cost of making any test shall be borne by the Contractor if such test is:
  - .1 Specified in the Contract to be performed by the Contractor, or
  - .2 In cases of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfill, specified in the Contract in sufficient detail to enable the Contractor to price or allow for the same in his Bid.

**5.4 COST OF TESTS NOT PROVIDED FOR**

- .1 If the Owner requires any test which is not provided for in the Contract and such test shows the Products or workmanship not to be in accordance with the Contract, then the cost of such test shall be borne by the Contractor, but in any other case clause 5.4.2 shall apply.
- .2 Where, pursuant to clause 5.4.1, this clause applies, the Owner shall determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount of any costs incurred by the Contractor, which shall be added to the Contract Price.

**5.5 INSPECTION AND TESTING**

- .1 The Owner shall at reasonable times have access to the Site and to all workshops and places where Products are being manufactured, fabricated or prepared for the Work and the Contractor shall afford every facility for, and every assistance in, obtaining the right to such access.
- .2 The Owner shall be entitled, during manufacture, fabrication or preparation to inspect and test the Products to be supplied under the Contract. If Products are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission for the Owner to carry out such inspection and testing in those workshops or places. Such inspection or testing shall not release the Contractor from any obligation under the Contract.

**5.6 DATES FOR INSPECTION AND TESTING**

- .1 The Contractor shall agree with the Owner on the time and place for the inspection or testing of any Products as provided in the Contract. The Owner shall give the Contractor not less than 48 hours notice of his intention to carry out the inspection or to attend the tests. If the Owner does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Owner, proceed with the tests. The Contractor shall forthwith forward to the Owner certified copies of the test results.

**5.7 REJECTION**

- .1 If, at the time and place agreed in accordance with clause 5.6, Products are not ready for inspection or testing or if, as a result of the inspection or testing referred to in clause 5.5, the Owner determines that the Products are defective or otherwise not in accordance with the Contract, he may reject the Products and shall notify the Contractor thereof immediately. The notice shall state the Owner's objections with reasons. The Contractor shall then promptly make good the defect or ensure that rejected Products comply with the Contract. If the Owner so requests, inspection and testing of rejected Products shall be made or repeated under the same terms and conditions.

**5.8 COST FOR INSPECTION AND TESTING**

- .1 All costs incurred by the Owner because of rescheduling, or undue delay of inspection and testing, and for which the Contractor is responsible, shall be determined by the Owner and shall be recoverable from the Contractor by the Owner.

**5.9 INDEPENDENT INSPECTION**

- .1 Inspection and testing of Products to be carried out by the Owner may be delegated to an independent agency. Any such delegation shall be effected in accordance with clause 1.3 and for this purpose such independent agency shall be considered as an assistant of the Owner.

**5.10 EXAMINATION OF WORK BEFORE COVERING UP**

- .1 The Contractor shall afford full opportunity for the Owner to examine and measure any part of the Work which is about to be covered up or put out of view and to examine exposed or excavated surfaces before any part of the Work is placed thereon. The Contractor shall give notice to the Owner whenever any such part of the Work or exposed or excavated surface is or are ready or about to be ready for examination and the Owner shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the Work or of examining such surfaces.

**5.11 UNCOVERING AND MAKING OPENINGS**

- .1 The Contractor shall uncover any part of the Work or make openings in or through the same as the Owner may from time to time instruct and shall reinstate and make good such part. If any such part has been covered up or put out of view after compliance with the requirement of clause 5.9 and is found to be executed in accordance with the Contract, the Owner shall determine the amount of the Contractor's costs in respect of such uncovering, making openings in or through, reinstating and making good, which shall be added to the Contract Price. In any other case all costs shall be borne by the Contractor.

**5.12 REMOVAL OF IMPROPER WORK OR PRODUCTS**

- .1 The Owner shall have authority to issue instructions for:
  - .1 The removal from the Site, within such time or times as may be specified in the instruction, of any Products which, in the opinion of the Owner, are not in accordance with the Contract,
  - .2 The substitution of proper and suitable Products, and
  - .3 The removal and proper re-execution, notwithstanding any previous test thereof or progress payment therefore, of any work which is not in accordance with the Contract.
- .2 In case of default by the Contractor in carrying out instructions pursuant to clause 5.12.1 within the time specified therein or, if none, within a reasonable time, the Owner may employ other persons or contract with other firms or corporations to carry out the same, and all costs consequent thereon or incidental thereto shall be determined by the Owner and shall be recoverable from the Contractor by the Owner.

**6. COMMENCEMENT, COMPLETION, CONTRACT TIME AND DELAYS**

**6.1 COMMENCEMENT OF WORK**

- .1 The Contractor shall commence the Work as soon as is reasonably possible in accordance with the instructions contained in the Letter of Acceptance and other provisions of the Contract. Thereafter, the Contractor shall proceed with the Work without delay.

**6.2 POSSESSION OF SITE AND ACCESS TO SITE**

- .1 If the Contractor suffers delay or incurs costs from failure of the Owner to give possession of the Site or part thereof in accordance with the provisions of the Contract, the Owner shall determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount of such costs, which shall be added to the Contract Price.
- .2 The Contractor shall bear all costs and charges for special or temporary rights-of-way required by him in connection with the Work. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Work.

**6.3 CONTRACT TIME**

- .1 The Contractor shall achieve Substantial Performance of the Work as a whole within the Contract Time.
- .2 When the Contractor is required to achieve Substantial Performance of part or parts of the Work prior to achieving Substantial Performance of the Work as a whole, the Contractor shall achieve Substantial Performance of such part or parts of the Work within the time or times specified and such time or times shall be considered to be the Contract Time or Times for such part or parts.

**6.4 EXTENSION OF CONTRACT TIME**

- .1 In the event of:
  - .1 A change in the Work made under clause 8.1, or
  - .2 Any cause of delay referred to in the Contract, or
  - .3 Abnormally adverse weather conditions, abnormal weather being defined as temperature, precipitation, humidity or wind that is outside of plus or minus one standard deviation from the mean, for the time period in question, determined pursuant to clause 4.5, or
  - .4 Any delay, impediment or prevention by the Owner, or
  - .5 Other special circumstances which may occur, other than through a default of or breach of Contract by the Contractor or for which he is responsible, being such as to affect an activity on the critical path of the Contractor's schedule, the Owner shall determine the extension of the Contract Time for the whole or part of the Work, to which the Contractor may be entitled.

**6.5 CONTRACTOR TO PROVIDE NOTIFICATION AND DETAILS**

- .1 The Owner shall not be bound to make any determination pursuant to clause 6.4 unless the Contractor has:
  - .1 Within 7 days after such event has first arisen notified the Owner, and
  - .2 Within 14 days, or such other reasonable time as may be agreed by the Owner after such notification, submitted to the Owner details of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

**6.6 INTERIM DETERMINATION OF EXTENSION OF TIME**

- .1 Where an event has a continuing effect such that it is not practicable for the Contractor to submit details within the period of 14 days referred to in clause 6.5.1.2, he may claim for an extension of time provided that he has submitted to the Owner interim details at intervals of not more than 14 days and final details within 14 days of the end of the effects resulting from the event. On receipt of such interim details, the Owner may make an interim determination of extension of time and, on receipt of the final details, the Owner shall review all the circumstances and may determine an overall extension of time in regard to the event. No final review shall result in a decrease of any extension of time already determined by the Owner. The Owner may determine an extension of the Contract Time notwithstanding that the Contract Time may have passed without being extended.

**6.7 RATE OF PROGRESS**

- .1 If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Work or any part is at any time, in the opinion of the Owner, too slow to comply with the Contract Time, the Owner may notify the Contractor who shall immediately take such steps as are necessary, subject to the consent of the Owner, to expedite progress so as to comply with the Contract Time. The Contractor shall not be entitled to any additional payment for taking such steps. If any steps, taken by the Contractor in meeting his obligations under this clause, involve the Owner in additional costs, such costs shall be determined by the Owner and shall be recoverable from the Contractor by the Owner.

**6.8 SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 When the whole of the Work has been substantially performed and any pre-requisites to Substantial Performance of the Work prescribed by the Contract have been met, the Contractor may so submit to the Owner a Certificate of Substantial Performance, accompanied by a written undertaking to finish without delay any outstanding work during the warranty period. Such notice and undertaking shall be deemed to be a request by the Contractor for the Owner to accept or reject the Certificate of Substantial Performance.
- .2 The Owner shall, within 21 days after the date of receipt of the certificate referred to in clause 6.8.1, either issue to the Contractor, a letter, stating the date on which, in his opinion, the Work was substantially performed in accordance with the Contract, or give instructions in writing to the Contractor specifying all the work which, in the Owner's opinion, is required to be done by the Contractor before the acceptance of such certificate. The Owner shall also notify the Contractor of any defects in the Work affecting substantial performance that may appear after such instructions and before completion of the Work

specified therein. The Contractor shall be entitled to receive such notification within 21 days after completion, to the satisfaction of the Owner, of the Work so specified and remedying all defects so notified. The Owner may specify the date for Total Performance of the Work in such notice.

**6.9 SUBSTANTIAL PERFORMANCE OF PART OR PARTS OF WORK**

- .1 In accordance with the procedure set out in clause 6.8, the Contractor may submit a Certificate of Substantial Performance to the Owner in respect of any substantial part of the Permanent Work which has been substantially completed and which has been or will be occupied or used by the Owner or an Other Contractor prior to Substantial Performance of the Work as a whole, whether or not such prior occupation or use is provided for in the Contract.

**6.10 TOTAL PERFORMANCE OF THE WORK**

- .1 When the whole of the Work has been totally performed and any pre-requisites to Total Performance of the Work prescribed by the Contract have been met, the Contractor may so submit written notice to the Owner. Such notice shall be deemed to be a request by the Contractor for the Owner to issue a Certificate of Total Performance of the Work.
- .2 The Owner shall, in accordance with the procedure set out in clause 6.8.2, either issue a Certificate of Total Performance of the Work or give instructions.

**6.11 WARRANTY PERFORMANCE OF THE WORK**

- .1 The Work of the Contract shall only be considered as completed when a Certificate of Warranty Performance of the Work has been signed by the Owner and delivered to the Contractor, stating the date on which the Contractor has completed his obligations to execute and complete the Work and remedy any defects therein to the Owner's satisfaction. The Certificate of Warranty Performance of the Work shall be given by the Owner within 28 days after the expiration of the warranty period, or, if different warranty periods are applicable to different parts of the Permanent Work, the expiration of the latest such period, or as soon thereafter as any Work instructed, pursuant to clause 7, has been completed to the satisfaction of the Owner.

**6.12 ACCELERATION**

- .1 If the Owner wishes to reduce the Contract Time for the Work or any part thereof, he shall issue to the Contractor a notice thereof and an instruction requiring the Contractor to submit to him within the period specified in the instruction:
  - .1 The Contractor's priced proposals for reducing the Contract Time, together with any consequential modifications to the construction schedule, or
  - .2 The Contractor's explanation why he is unable to reduce the Contract Time.
- .2 If the Owner accepts the Contractor's proposals submitted pursuant to clause 6.12.1.1, including amendments thereto agreed by both parties, the Owner shall issue instructions to the Contractor modifying the Contract accordingly. Such instructions shall include:
  - .1 The revised Contract Time or Times,

- .2 The modifications to the construction schedule,
  - .3 The revised Contract Price, and
  - .4 Any other relevant modifications to the Contract.
- .3 The Contractor may at any time submit to the Owner proposals to reduce the Contract Time for the Work or part thereof. The Owner shall consider such proposals and if he accepts them he shall take action as in clause 6.12.2.

### 6.13 DAMAGES FOR DELAY

- .1 Without prejudice to any other right the Owner may have with respect to damages, if the Contractor fails to achieve Substantial Performance of the Work or, if applicable, of part of the Work, within the Contract Time or Times, the Contractor shall pay to the Owner an amount equal to the sum of:
- .1 **One Thousand Dollars (\$1,000)** as liquidated damages and not as a penalty for each calendar day the Work is not substantially complete after the Date of Substantial Performance. The said sum being a fair estimate of the actual damages the Owner will incur if the Work is not completed by the said Substantial Performance Date.
  - .2 **One Thousand Dollars (\$1,000)** as liquidated damages and not as a penalty for each calendar day the Work remains uncompleted after the date of Total Performance. The said sum being a fair estimate of the actual damages the Owner will incur if the Work is not completed by the said Total Performance Date.
  - .3 All other costs and damages incurred or sustained by the Owner as a result of the Contractor's failure to achieve Substantial Performance of the Work or part thereof within the Contract Time or Times.
- .2 The Owner may, without prejudice to any other method of recovery, deduct the amount referred to in clause 6.13.1 from any monies due or to become due to the Contractor under the Contract. The payment or deduction of such amount shall not relieve the Contractor from his obligation to complete the Work or from any other of his contractual obligations.
- .3 For the purposes of this clause, "period of delay" means the period commencing on the date specified in the Contract for Substantial Performance of the Work or part thereof and ending on the day immediately preceding the date on which Substantial Performance of the Work or part thereof is actually achieved.

### 6.14 COVID-19 PANDEMIC RESPONSE AND MITIGATION

- .1 The Contractor and the Owner acknowledge the presence of the COVID-19 virus in Canada and other jurisdictions forming part of the supply chain for materials and labour required for the Project (the "COVID-19 Pandemic").
- .2 Known Impacts – The consequences and impacts of the COVID-19 Pandemic existing as of the date of this Contract include, without restriction:
- .1 Orders, directives and recommendations of any government authority issued up to and including the date of this Contract, and respecting public health or other

requirements related to response to and prevention of infection by the COVID-19 virus;

- .2 impacts to availability of labour or materials required in order to carry out the Work, arising from the COVID-19 Pandemic;
- .3 the impacts of the Province of Alberta withdrawing or deferring the advancement of any or all portions of their committed funding to the Project;
- .4 the impacts of self-isolation/quarantine or regulated quarantine as ordered by the Province of Alberta;

(the “**Known Impacts**”), and are known to the Contractor and to the Owner, and have been accounted for by the Contractor within the construction schedule, as well as the Contract Price.

- .3 Notwithstanding anything contained within the Contract, the Contractor and the Owner covenant and agree as follows:

- .1 no extension of the Contract Time or schedule shall be made and no adjustment to the Contract Price shall be made due to any Known Impacts.
- .2 for greater clarity and without limiting the generality of clause 6.14.3.1,
  - .1 the Contractor shall not be entitled to any reimbursement of any costs and expenses incurred by the Contractor necessitated by a suspension or delay under clause 12 where the suspension is due to any Known Impacts;
  - .2 notwithstanding anything contained within clause 12, a suspension of the Work because of any Known Impacts whether ordered by the Owner or the Owner’s Representative or not, shall not be deemed to be a suspension of the Work within the meaning of clause 12;
  - .3 notwithstanding anything contained within clause 6, no extension of the Contract Time shall be made and no adjustment in the Contract Price shall be made for any delay caused by a compliance with any order, directive or recommendation of any government authority related to the COVID-19 Pandemic, and/or caused by any other Known Impacts, whether ordered by the Owner or the Owner’s Representative or not;
  - .4 notwithstanding anything contained within clause 6, no extension of Contract Time shall be made and no adjustment in the Contract Price shall be made for any delay Claim that is based on the concept of the cumulative impact of any Known Impacts;
  - .5 no extension of the Contract Time shall be made and no adjustment to the Contract Price shall be made due to any requirement that an employee of the Contractor or any Subcontractor self-isolate or quarantine as a result of a diagnosis or potential diagnosis as being COVID-19 positive;
- .3 Any Claims for adjustment in the Contract Price arising from or related to the COVID-19 Pandemic shall be net of any and all compensation schemes, support programs or other financial aids made available to the Contractor by any government authority.

**7. WARRANTY**

**7.1 WARRANTY PERIOD**

- .1 In the Contract the term "warranty period" shall mean a period of one (1) year, or such longer period as may be provided elsewhere in the Contract, calculated from:
  - .1 The date of Substantial Performance of the Work, certified by the Owner in accordance with clause 6.8, or
  - .2 In the event of more than one certificate having been issued by the Owner under clause 6.9, the respective dates so certified, or
  - .3 In the case of outstanding work to be completed after the date or dates of Substantial Performance referred to in clauses 7.1.1.1 and 7.1.1.2, the date upon which such work is certified as complete by the Owner, and in relation to the warranty period the term "the Work" shall be construed accordingly.

**7.2 COMPLETION OF OUTSTANDING WORK**

- .1 The Contractor shall complete work outstanding at the date of Substantial Performance of the Work within the time specified by the Owner in the Certificate of Substantial Performance of the Work.

**7.3 REMEDYING DEFECTS**

- .1 The Contractor shall, during or as soon as practicable after the expiration of the warranty period, remedy any defects in the Work and execute any work of modification or reconstruction related thereto, as the Owner may, during the warranty period or within 14 days after its expiration instruct the Contractor to do.
- .2 Work referred to in clause 7.3.1 shall be executed by the Contractor at his own cost if the necessity thereof is, in the opinion of the Owner, due to:
  - .1 Defects in Products or workmanship, or defects in design for which the Contractor is responsible,
  - .2 The neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract. If, in the opinion of the Owner, such necessity is due to any other cause, he may determine an addition to the Contract Price in accordance with clause 8.

**7.4 CONTRACTOR'S FAILURE TO CARRY OUT INSTRUCTIONS**

- .1 If the Contractor defaults in carrying out instructions issued pursuant to clause 7.2 or 7.3, the Owner may employ other persons or contract with other firms or corporations to carry out the same. If such work is work, which, in the opinion of the Owner, the Contractor was liable to do at his own cost, then all costs consequent thereon or incidental thereto shall be determined by the Owner and shall be recoverable from the Contractor by the Owner.

**7.5 CONTRACTOR TO SEARCH**

- .1 If any defect in the Work appears at any time prior to the end of the warranty period, the Owner may instruct the Contractor to search for the cause thereof. If such defect is one for which the Contractor is liable, the cost of the work carried out in searching shall be borne by the Contractor and he shall in such case remedy such defect at his own cost in accordance with the provisions of clauses 7.3 and 7.4. If such defect is one for which the Contractor is not liable under the Contract, the Owner shall determine the amount of the costs of such search incurred by the Contractor, which shall be added to the Contract Price.

**8. CHANGES AND VARIATIONS**

**8.1 CHANGES IN THE WORK**

- .1 Consistent with the Work, the Owner may make changes in the Work or any part thereof, and he shall have the right to instruct the Contractor to make such changes and the Contractor shall make such changes, which may include:
  - .1 Increasing or decreasing the quantity of any work included in the Contract,
  - .2 Omitting any work, but not if the omitted work is to be carried out by the Owner or by an Other Contractor except by reason of the Contractor's default or negligence,
  - .3 Changing the character or quality or kind of any work,
  - .4 Changing the levels, lines, position and dimensions of any part of the Work,
  - .5 Executing additional work of any kind necessary for the completion of the Work,
  - .6 Changing any specified sequence or timing of construction of any part of the Work.
- .2 No such change shall invalidate the Contract, but the effect, if any, of such changes on the Contract Price shall be valued in accordance with clause 8.3 and any extension of the Contract Time shall be determined in accordance with clause 6.4. Where an instruction to change the Work is necessitated by default or negligence of the Contractor or for which he is responsible, any cost and time attributable to such default or negligence shall be borne by the Contractor.

**8.2 INSTRUCTIONS FOR CHANGES IN THE WORK**

- .1 The Contractor shall not make any changes in the Work without a written instruction from the Owner.
- .2 No instruction shall be required for:
  - .1 An increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this clause, but is the result of quantities exceeding or being less than those stated in the Schedule of Prices, and
  - .2 A change or adjustment in lines, levels, grades or elevations when such change or adjustment is already provided for in the Contract.

**8.3 VALUATION OF CHANGES IN THE WORK**

- .1 Changes referred to in clause 8.1 and any changes to the Contract Price which are required to be determined in accordance with this clause (for the purposes of this clause referred to as "changed work"), shall be valued, at the Owner's option:
  - .1 At the rates and prices set out in the Contract if, in the opinion of the Owner, these are applicable, or
  - .2 If the rates and prices set out in the Contract are not applicable to the changed work, at rates and prices deduced or extrapolated from such rates and prices, or
  - .3 By acceptance by the Owner of rates and prices submitted by the Contractor or other rates and prices as may be agreed by negotiation, or
  - .4 By acceptance by the Owner of a lump sum quotation submitted by the Contractor or other lump sum as may be agreed by negotiation, or
  - .5 As Cost Plus Work in accordance with the provisions of Section 00630 – Payment Conditions.
- .2 If there is disagreement on the value of changed work, the Owner shall fix such rates or prices as are, in his opinion, appropriate and shall notify the Contractor accordingly. Until such time as rates or prices are agreed or fixed, the Owner shall determine provisional rates or prices to enable on-account payments to be made in accordance with the payment conditions of the Contract.

**8.4 IMPACT OF CHANGES IN THE WORK**

- .1 If in the opinion of the Owner or the Contractor the nature or amount of any changed work relative to the nature or amount of the whole of the Work or to any part thereof, is such that the rate or price contained in the Contract for any item of the Work is, by reason of such changed work, rendered inappropriate or inapplicable, then, after due consultation by the Owner with the Contractor, a suitable rate or price may be agreed upon between the Owner and the Contractor.
- .2 If there is disagreement on the rates or prices referred to in clause 8.4.1, the Owner shall fix such rate or price as is, in his opinion, appropriate and shall notify the Contractor. Until such time as rates or prices are agreed or fixed, the Owner shall determine provisional rates or prices to enable on-account payments to be made in accordance with the payment conditions of the Contract.

**8.5 QUANTITY VARIATIONS**

- .1 The quantities set out in the Schedule of Prices are approximate only and no claim shall be made by the Contractor against the Owner on account of any excess or deficiencies absolute or relative, in the same.
- .2 The price or prices provided in the Contract whether stipulated sum or unit price or both shall be accepted by the Contractor, as full compensation for everything furnished and done by the Contractor under the Contract, including all Work required but not included in the items herein mentioned, and also for all loss or damages arising out of the nature of the Work or the action of the weather, elements, or any unforeseen obstruction or difficulty

encountered in the prosecution of the work, and for all risks of every description connected with the Work, and for all expenses incurred by or in the consequence of any delay or suspension or discontinuance of the work as herein specified, and for well and faithfully completing the Work as provided in the Contract.

**9. CHANGES IN COST AND REGULATORY REQUIREMENTS**

**9.1 INCREASE OR DECREASE IN COST**

- .1 Subject to clause 9.2, the Contract Price shall not be subject to any adjustment in respect of rise or fall in the cost of labour, Products or any other matters affecting the cost of execution of the Contract.

**9.2 CHANGES IN REGULATORY REQUIREMENTS**

- .1 If, after the latest date for submission of Bids for the Contract, there is a change to any Regulatory Requirement, or a new Regulatory Requirement is introduced, which causes additional or reduced cost to the Contractor in the execution of the Contract, such additional or reduced cost shall be determined by the Owner and shall be added to or deducted from the Contract Price.
- .2 When a Regulatory Requirement is changed or introduced during the period of time referred to in clause 9.2.1 but public notice thereof has been given by the applicable authority before the commencement of such period of time, the change or introduction shall be deemed to have occurred before the commencement of such period of time.

**10. CLAIMS**

**10.1 NOTICE OF CLAIMS**

- .1 If the Contractor intends to claim any additional payment, he shall give notice of his intention to the Owner within 7 days after the event giving rise to the claim has first arisen.
- .2 Upon the occurrence of the event referred to in clause 10.1.1, the Contractor shall take all reasonable measures required to mitigate any loss or damage, which may be incurred as a result of such event.

**10.2 CONTEMPORARY RECORDS**

- .1 Upon the occurrence of the event referred to in clause 10.1, the Contractor shall keep such contemporary records as may reasonably be necessary to support any claim he may subsequently wish to make, including records of time and cost relating to labour, products, construction equipment and other resources used in the work. The Contractor shall permit the Owner to inspect all records kept pursuant to this clause and shall supply him with copies thereof as and when the Owner so instructs.

**10.3 SUBSTANTIATION OF CLAIMS**

- .1 Within 14 days, or such other reasonable time as may be agreed by the Owner, of giving notice under clause 10.1, the Contractor shall send to the Owner an account giving detailed particulars of the amount claimed and the grounds upon which the claim is based. Where

the event giving rise to the claim has a continuing effect, such account shall be considered to be an interim account and the Contractor shall, at such intervals as the Owner may reasonably require, send further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. In cases where interim accounts are sent to the Owner, the Contractor shall send a final account within 14 days after the end of the effects resulting from the event.

#### **10.4 PAYMENT OF CLAIMS**

- .1 The Contractor shall be entitled to have included in any progress payment such amount in respect of any claims as the Owner may consider due to the Contractor. If information is insufficient to substantiate the whole of the claim, the Contractor shall be entitled to payment in respect of such part of the claim as such information may substantiate to the satisfaction of the Owner.

#### **10.5 OBLIGATIONS TO AND CLAIMS OF THIRD PARTIES**

- .1 The Contractor shall, with respect to lawful obligations of and lawful claims against the Contractor or any Subcontractor arising from the Contract:
  - .1 Discharge such obligations of and satisfy such claims against the Contractor, and
  - .2 Ensure the discharge of such obligations of and the satisfaction of such claims against Subcontractors.
- .2 The Contractor shall, when requested by the Owner, make a statutory declaration deposing to the existence and condition of any obligations and claims referred to in clause 10.5.1.
- .3 If a third party sends written notice to the Owner of an undischarged obligation or unsatisfied claim referred to in clause 10.5.1, the Owner may, 30 days after giving written notice to the Contractor, and surety where applicable:
  - .1 Pay any amount that is due and payable to the Contractor pursuant to the Contract directly to the obligees of and the claimants against the Contractor or the Subcontractor, and
  - .2 Where security for payment of claims has been provided in the form of a security deposit, the Owner may deduct such amount from the security deposit, or
  - .3 Where a security deposit has not been provided or insufficient monies are available in the security deposit, the Owner may deduct such amount, or portion thereof, from the amount payable to the Contractor under the Contract.
- .4 Clause 10.5.3 shall apply only when written notice of the obligation or claim is sent to Owner as set out in the Builders' Lien Act.

#### **10.6 CLAIMS AGAINST OWNER ONLY**

- .1 Any claims, demands or actions by the Contractor, arising out of alleged errors, omissions or misrepresentations in the Contract Documents or arising out of acts or omissions of the Owner's Representative or his assistants during the execution of the Work, shall be made only to or against the Owner. The Contractor waives any right to commence or carry on such claims, demands or actions against any person or party other than the Owner.

**11. RELEASE FROM PERFORMANCE**

**11.1 FRUSTRATION**

- .1 If any circumstance outside the control of both the Owner and the Contractor arises after the award of the Contract which renders it impossible or unlawful for either party to fulfill his contractual obligations, then the Owner or the Contractor may terminate the Contract by giving notice to the other party and, upon such notice, the Contract shall, except as to the rights of the parties under this clause and to the operation of clause 15, terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof.

**11.2 REMOVAL OF CONSTRUCTION EQUIPMENT ON TERMINATION**

- .1 If the Contract is terminated pursuant to clause 11.1, the Contractor shall remove from the Site all Construction Equipment.

**11.3 PAYMENT IF CONTRACT TERMINATED**

- .1 If the Contract is terminated pursuant to clause 11.1, the Contractor shall be paid by the Owner, insofar as such amounts or items have not already been covered by payments on account made to the Contractor, for all Work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:
  - .1 The cost of Products reasonably ordered for the Work which have been delivered in acceptable condition to the Contractor or of which the Contractor is liable to accept delivery, such Products becoming the property of the Owner upon such payments being made by him,
  - .2 The amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Work insofar as such expenditure has not been covered by any other payments referred to in this clause,
  - .3 Such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, for removal of Construction Equipment under clause 11.2 provided that against any payment due from the Owner under this clause, the Owner shall be credited with any amounts which, at the date of termination, were recoverable by the Owner from the Contractor.
- .2 Any amount payable under this clause shall be determined by the Owner.

**12. SUSPENSION AND TERMINATION BY OWNER**

**12.1 SUSPENSION OF WORK**

- .1 The Contractor shall, on the instructions of the Owner, suspend the progress of the Work or any part thereof for such time and in such manner as the Owner may consider necessary and shall, during such suspension, properly protect and secure the Work or such part thereof so far as is necessary in the opinion of the Owner. Clause 12.2 shall apply unless such suspension is:
  - .1 Otherwise provided for in the Contract, or

- .2 Necessary by reason of some default of or breach of contract by the Contractor or for which he is responsible, or
- .3 Necessary by reason of normal weather conditions on the Site, or
- .4 Necessary for the proper execution of the Work or for the safety of the Work or any part thereof, except to the extent that such necessity arises from any act or default by the Owner, in which case such suspension shall be at the Contractor's expense.

**12.2 OWNER'S DETERMINATION FOLLOWING SUSPENSION**

- .1 Where, pursuant to clause 12.1, this clause applies the Owner shall determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount, which shall be added to the Contract Price, in respect of the cost incurred by the Contractor by reason of such suspension.

**12.3 SUSPENSION LASTING MORE THAN 91 DAYS**

- .1 If the progress of the Work or any part thereof is suspended on the written instructions of the Owner and if permission to resume work is not given by the Owner within a period of 91 days after the date of suspension then, unless such suspension is the Contractor's responsibility pursuant to clauses 12.1.1.1 to 12.1.1.4, the Contractor may give notice to the Owner requesting permission, within 28 days from the receipt thereof, to proceed with the Work or that part thereof in regard to which progress is suspended. If, within such time, such permission is not granted, the Contractor may elect to treat the suspension, where it affects only part of the Work, as an omission of such part under clause 8.1 by giving a further notice to the Owner to that effect, or, where it affects the whole of the Work, treat the suspension as an event of default by the Owner and terminate the Contract in accordance with the provisions of clause 14, in which case the provisions of clauses 14.2 and 14.3 shall apply.

**12.4 TERMINATION OF CONTRACT**

- .1 The Owner may terminate the Contract at any time by giving a notice of termination to the Contractor. When such a notice is received by the Contractor he shall, subject to the provisions of such notice, forthwith cease all operations in performance of the Contract.
- .2 If the Owner terminates the Contract pursuant to clause 12.4.1, the Owner shall be under the same obligations to the Contractor in regard to payment as if the Contract had been terminated under the provisions of clause 14.

**13. DEFAULT OF CONTRACTOR**

**13.1 DEFAULT**

- .1 If the Contractor:
  - .1 Is deemed by law unable to pay his debts as they fall due, or becomes insolvent, or

- .2 Enters into voluntary or involuntary bankruptcy, liquidation or dissolution (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or
  - .3 If any act is done or event occurs with respect to the Contractor or his assets which, under any applicable law, has a similar effect to any of the foregoing, or if he
  - .4 Has contravened clause 2.1, or
  - .5 Has repudiated the Contract, then the Owner may, upon written notice, enter upon the Site and the Work and immediately terminate the Contractor's right to continue with the Work.
- .2 If the Owner determines, that, in his opinion, the Contractor without reasonable excuse:
- .1 Has failed to commence and proceed with the Work or any part thereof in accordance the provisions of the Contract, or
  - .2 Has failed to comply with a notice issued pursuant to clause 6.7 or an instruction issued pursuant to clause 6.12 within 14 days after receiving it, or
  - .3 Despite previous warning from the Owner, in writing, is otherwise persistently or flagrantly neglecting to comply with any of his obligations under the Contract, or
  - .4 Has contravened clause 2.2, or
  - .5 Has failed to attain Substantial Performance of the Work or part or parts of the Work within the Contract Time or Times pursuant to clause 6.3, then the Owner may, after giving 14 days notice to the Contractor, and unless the Contractor has within such period remedied the default, enter upon the Site and the Work and terminate the Contractor's right to continue with the Work in whole or in part.
- .3 If the Owner terminates the Contractor's right to continue with the Work, in whole or in part, pursuant to clause 13.1.1 or clause 13.1.2, such termination shall not release the Contractor from any of his obligations or liabilities under the Contract, and shall not affect the rights and authorities conferred on the Owner by the Contract, and the Owner may complete the Work or part thereof, or may contract with any Other Contractor to complete the Work or part thereof. The Owner or such Other Contractor may use for such completion so much of the Construction Equipment, Temporary Work and Products as he or they may think proper.

**13.2 VALUATION AT DATE OF TERMINATION**

- .1 The Owner shall, as soon as practicable after any entry and termination by the Owner pursuant to clause 13.1, determine:
  - .1 What amount (if any) had, at the time of such entry and termination, been reasonably earned by or would reasonably accrue to the Contractor in respect of work then actually done by him under the Contract, and
  - .2 The value of any unused or partially used Products, any Construction Equipment and any Temporary Work.

**13.3 PAYMENT AFTER TERMINATION**

- .1 If the Owner terminates the Contractor's right to continue with the Work in whole or in part under clause 13.1, he shall not be liable to pay to the Contractor any further amount in respect of the Contract until the expiration of the warranty period and thereafter until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any) and all other expenses incurred by the Owner have been determined. The Contractor shall then be entitled to receive only such sum (if any) as the Owner may determine would have been payable to him upon due completion by him after deducting the said amount. If such amount exceeds the sum which would have been payable to the Contractor on due completion by him, then the Contractor shall, upon demand, pay to the Owner the amount of such excess and it shall be deemed a debt due by the Contractor to the Owner and shall be recoverable accordingly.

**13.4 ASSIGNMENT OF BENEFIT OF AGREEMENT**

- .1 The Contractor shall, if so instructed by the Owner within 14 days of the entry and termination referred to in clause 13.1, assign to the Owner the benefit of any agreement for the supply of any goods or materials or services and/or for the execution of any work for the purposes of the Contract, which the Contractor may have entered into.

**14. DEFAULT OF OWNER**

**14.1 FAILURE OF OWNER TO PAY**

- .1 If the Owner fails to pay to the Contractor any amount due under the Contract within 28 days after the expiry of the time stated in the Payment Conditions within which payment is to be made, the Contractor may terminate the Contract by giving notice to the Owner. Such termination shall take effect 14 days after the giving of such notice unless payment is received within such period.

**14.2 REMOVAL OF CONSTRUCTION EQUIPMENT**

- .1 Upon the termination of the Contract referred to in clause 14.1, the Contractor shall remove promptly from the Site all Construction Equipment.

**14.3 PAYMENT ON TERMINATION**

- .1 In the event of termination pursuant to clause 14.1 the Owner shall be under the same obligations to the Contractor in regard to payment as if the Contract had been terminated under the provisions of clause 11, but, in addition to the payments specified in clause 11.3, the Owner shall pay to the Contractor the amount of any loss or damage, including reasonable profit, to the Contractor directly arising out of or in connection with or by consequence of such termination.

**14.4 CONTRACTOR MAY SUSPEND WORK**

- .1 As an alternative to termination under clause 14.1 but without prejudice to the Contractor's entitlement to terminate under clause 14.1, the Contractor may, after giving 14 days' prior notice to the Owner, suspend work or reduce the rate of work.

- .2 If the Contractor suspends or reduces the rate of work pursuant to clause 14.4.1 and thereby suffers delay or incurs cost the Owner shall determine:
  - .1 Any extension of time to which the Contractor is entitled under clause 6.4, and
  - .2 The amount of such costs, which shall be added to the Contract Price.

**14.5 RESUMPTION OF WORK**

- .1 When the Contractor suspends work or reduces the rate of work pursuant to clause 14.4.1 and the Owner subsequently pays the amount due, the Contractor's entitlement under clause 14.1 shall, if notice of termination has not been given, lapse and the Contractor shall resume normal working as soon as is reasonably possible.

**15. SETTLEMENT OF DISPUTES**

**15.1 DISPUTES**

- .1 If a dispute of any kind arises between the Owner and the Contractor in connection with, or arising out of, the Contract or the execution of the Work, whether during the execution of the Work or after its completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Owner, the matter in dispute shall be settled in accordance with the provisions of this clause 15.
- .2 Unless the Contract has already been repudiated or terminated, the Contractor shall, during the course of any dispute settlement, and without prejudice to any claim the Contractor may have:
  - .1 Proceed with the Work without delay, and
  - .2 Comply with any instructions issued by the Owner with respect thereto, unless and until such instructions are revised, as hereinafter provided, in a negotiated settlement or an arbitral or judicial award.

**15.2 NOTICE OF DISPUTE**

- .1 A dispute shall be deemed to arise when the Owner or the Contractor serves on the other party a written notice of dispute stating the nature of the dispute. No notice of dispute shall be served by either party unless all other applicable provisions of the Contract have been invoked.

**15.3 NEGOTIATED SETTLEMENT**

- .1 The Owner and the Contractor shall make bona fide efforts to settle any dispute arising between them by negotiations, in accordance with this clause 15.3, and provide timely disclosure of all relevant facts, information and documents to such negotiations.
- .2 Within 14 days after the serving of a notice of dispute by one party on the other pursuant to clause 15.2, the parties shall commence negotiations for the purposes of settling the dispute. Such settlement process may include, if both parties agree, the use of mediation.

- .3 If, after 28 days, or such longer period as the parties and the mediator, if any, may agree, after the commencement of negotiations pursuant to clause 15.3.2, the parties have not settled the dispute, it shall be referred to arbitration, unless the parties mutually agree otherwise.

**15.4 MEDIATION**

- .1 If, in their efforts to reach a negotiated settlement, the parties agree to use mediation pursuant to clause 15.3.2, such mediation shall be conducted by a single mediator acceptable to both parties and under terms-of-reference established by both parties and the mediator. The parties shall share equally the cost of mediation.

**15.5 ARBITRATION**

- .1 A reference to arbitration pursuant to clause 15.3.3 shall be effected by either party serving on the other party a notice to refer the dispute to arbitration and such dispute shall be referred to a single arbitrator agreed for that purpose or, in default of agreement within a reasonable time, appointed at the request of the Owner or the Contractor by the Alberta Arbitration and Mediation Society.
- .2 A reference to arbitration under this clause shall be a reference to which the Arbitration Act (Alberta) applies and any award pursuant thereto shall bind the parties, except as otherwise provided by the Act.

**END OF SECTION**

**1. SUPPLEMENTARY CONDITIONS**

- .1 These Supplementary Conditions provide information relative to specific items not covered in other sections.

**2. ALBERTA ENVIRONMENT NAME CHANGE**

- .1 Any reference to “Alberta Environment” refers to the Provincial Regulatory Agency that is responsible for the ‘Water Act’, ‘Environmental Protection and Enhancement Act’, and ‘Public Lands Act’.
- .2 The Owner has made application for the proposed work under the Alberta Environmental Protection and Enhancement Act. Do not commence work on the project until approval has been obtained by the Owner.

**3. PROJECT FUNDING**

- .1 The Owner has made funding applications for the project work. Do not commence work until funding approval has been obtained by the Owner.

**4. WARRANTY PERIOD**

- .1 The Warranty Period for all Civil work is Two (2) Years and all Electrical work is One (1) Year.

**5. INCIDENTAL ITEMS**

- .1 The following items are incidental to the contract and no separate payment will be made for this work:
  - .1 All submittals.
  - .2 All Road Restoration beyond the Limits of Work, which have been damaged or disturbed by the Work.
  - .3 All Site Restoration beyond the Limits of Work, which have been damaged or disturbed by the Work.
  - .4 Locating, protecting, and reconnecting where necessary all existing utilities (underground and overhead) and service connections, existing trees, fences, buildings, etc.
  - .5 Working in proximity to and crossing of utilities including Alberta One-Call notification, third party locations and hydrovacating / hand exposure as required.
  - .6 Public notification program and coordination of Airport shutdown with the Town of Drumheller and the Airport Manager. A minimum of three business days’ notice must be provided to the Airport Manager and the Town of Drumheller prior to shut down.

- .7 Road/lane closure and traffic control, providing access to existing residences, businesses or facilities as required or to provide nearby alternate parking.
- .8 Cleaning and delivery of salvaged material removed during construction to the Owner's Public Works yard.
- .9 Working in Proximity to an Airport Runway. Keep all equipment and materials off of the runway and follow all Transport Canada Regulations. A designated laydown area has been established within the Contract Drawings.
- .10 Proof rolling.
- .11 Dust control.
- .12 Care of Water.
- .13 Removal and replacement of guardrail, fencing, signs, etc., necessary to complete the work.
- .14 Wheel cutting of asphalt.
- .15 All materials having a salvage value shall be excavated and removed in such a manner that no damage shall be done to the material. Such material shall be removed, cleaned and stored at a location within the work area. At the completion of the project all salvage items shall be transferred to the Owner's Public Works yard for storage. There will be no separate payment for salvaging or transferring to storage of these items.
- .16 Unless indicated otherwise, non-salvageable materials will be excavated, transported and disposed of at the nearest sanitary landfill site. Burying of non-salvageable materials will not be allowed under any circumstances. Removal and replacement of guardrail, fencing, signs, etc., necessary to complete the work.
- .17 There will be no separate payment for Disposal of Waste Materials. The cost of Disposal of Waste Materials including the cost of materials, labour, equipment supply, excavation, handling, hauling, and disposal shall be included in the prices bid in the Tender Form.
- .18 Minimize damage to trees, plants, and shrubs during the course of construction.
- .19 Attend to damaged trees, plants, or shrubs by qualified personnel.
- .20 Permits required throughout the course of Construction will need to be coordinated by the Contractor through Starland County. This includes but is not limited to haul route agreements.

**6. SITE EXAMINATION**

- .1 Examine the site of work and become familiar with all features and characteristics affecting this work before submitting tender.
- .2 No additional compensation will be given for extra work due to existing conditions which such examination should have disclosed.
- .3 Report any unsatisfactory conditions prior to tendering which may adversely affect the proper completion of this work.

**7. ELECTRICAL EQUIPMENT AVAILABILITY**

- .1 Provide all labour and material. Provide all labour and miscellaneous materials to provide a complete and operating installation.
- .2 Verify prior to bidding, that all specified items will be available in time for installation during orderly and timely progress of the Work.
- .3 In the event specified items will not be available, notify the electrical engineer prior to receipt of bids and identify appropriate substitute.
- .4 Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, shall be back-charged as necessary and shall not be borne by the Owner.

**END OF SECTION**

**1. GENERAL**

**1.1 WORK OF THE PROJECT**

.1 Work of the Project, of which Work of this Contract is a part, comprises the following:

.1 Drumheller Municipal Airport (CEG4) Rehabilitation

**1.2 WORK OF THIS CONTRACT**

.1 The main items of Work of this Contract include the following:

.1 Runway rehabilitation including crack repairs, full depth repairs, asphalt levelling course, 50 mm overlay and new pavement markings.

.2 Taxiway and apron rehabilitation including crack repairs, full depth repairs, 50mm overlay and new pavement markings.

.3 Minor drainage improvements and tile drain installation.

.4 Decommission and remove existing lighting equipment.

.5 New lighting upgrades and relocation of wind cone.

.6 ARCAL upgrade.

.2 The Site of the Work of this Contract is located North of Drumheller, Alberta

**1.3 CONTRACT TIME**

.1 The Contract will commence on the date on which the Letter of Acceptance is issued.

.2 Upon receipt of the Letter of Acceptance, promptly, and without undue delay, commence work at the Site.

.3 Attain Substantial Performance of the Work by June 1, 2022.

.4 Attain Total Performance of the Work by June 15, 2022.

**1.4 WORK RESTRICTION/MILESTONE DATES**

.1 Coordinate work with Airport operator to minimize downtime of airport usage. Contractor is to coordinate shut down of the Airport a minimum of three business days prior to closure to allow the Owner enough time to alert the proper authorities.

**1.5 USE OF THE SITE**

.1 The Site Limits are specified in the Contract Documents.

.2 Approximate locations of existing utility lines within the Site that are known to the Owner are specified in the Contract Documents.

.3 Site Limits to allow for construction access are specified in the Contract Documents.

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.4 Use of the areas within the Site described below are subject to the following conditions:

.1 Maintain public access as specified in Section 01552 – Existing and Temporary Roads.

.5 Assume responsibility for the care and protection of the existing work.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 MEASUREMENT SYSTEM**

- .1 This section specifies the measurement rules that will generally be used for payment purposes unless otherwise specified in the Contract Documents. In case of conflict between the method of measurement specified in this section and the requirements specified in Section 01280 – Measurement Schedule, the latter will govern.
- .2 Work will be measured in the International System of Units (SI) in accordance with CAN/CSA–Z234.1–89 Canadian Metric Practice Guide.
- .3 When used in the Contract, the following abbreviations and symbols have the meaning assigned to them.

<b>Abbreviation/Symbol</b>	<b>Meaning</b>
µm	micrometre or micron
mm	millimetre
m	metre
mm <sup>2</sup> or mm2	square millimetre
m <sup>2</sup> or m2	square metre
ha	hectare
kPa	kilopascal
MPa	megapascal
m <sup>3</sup> or m3	cubic metre
L	litre
L.S.	lump sum
g	gram
kg	kilogram
N	newton
kN	kilonewton
t	tonne
no.	number (quantity)
min	minute (time)
h	hour
d	day
wk	week
%	percent
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
\$	Canadian dollars
°	degree (angle)
°C	degree Celsius
vm	vertical metre
rpm	revolutions per minute
US gpm	US gallon per minute
gal	gallon
Btu	British thermal unit
VDC	volts of direct current
VAC	volts of alternating current
Ah	amp hour

**1.2 METHOD OF MEASUREMENT**

.1 Unless otherwise indicated in the Contract Documents:

- .1 Earthwork materials will be measured net in place after compaction, with no allowance for bulking, shrinkage, compression, foundation settlement, or waste;
- .2 Products will be measured net, with no allowance for waste;
- .3 Dimensions used in calculating quantities will be rounded to the nearest unit of dimension as follows:

<b>Quantity</b>	<b>Dimension</b>
Volume of earth	centimetre
Volume of concrete	millimetre
Length of pipe	centimetre
Area of land	decimetre

- .4 The survey station grid system adopted will be at 10 linear metres spacing on curves and 20 linear metres spacing on tangent sections for measuring earthwork quantities, respectively;
  - .5 Contours may be based on aerial photograph interpretation and are approximate only. Actual ground elevations and location co-ordinates will be determined in the field during the course of the Work for measurement purposes; and
  - .6 Measurement and payment will not be made for work carried out beyond measurement and payment lines and limits specified in the Contract Documents.
- .2 When boundaries between different items of Work are not specified in the Contract Documents, such boundaries will be established by the Owner.

.3 Mass:

- .1 Mass will be measured by weigh scale or by estimated or theoretical mass taken from reference documents, as specified.
- .2 Mass will be measured to 3 decimal places.

.4 Length:

- .1 Length will be measured at the item centreline or mean chord.
- .2 Items to be measured by linear dimension will be measured parallel to the base or foundation upon which such items are placed.
- .3 Items to be measured by station will be measured horizontal to the base or foundation upon which such items are placed.

- .4 Centre line for pipes, ducts, culverts, and similar items will be the line equidistant between inside faces of pipe walls.
- .5 Area:
  - .1 For rectangular and regular shaped objects, area will be measured using mean length and width or radius.
  - .2 For irregular objects, area will be measured by the sum of squares, triangles, and circles, etc., as selected by the Owner.
- .6 Volume:
  - .1 Unless otherwise indicated, volume will be measured using mean length, width, and height or thickness.
  - .2 Excavation and fill volumes will be computed using a digital terrain modelling computer software program.
- .7 Time:
  - .1 Construction Equipment to be paid for on a time basis will be measured in hours of actual working time, and necessary travelling time, when under its own power to the nearest tenth thereof.
  - .2 Hauling equipment to be paid for on a time basis will be measured in hours of actual working time to the nearest tenth thereof.
- .8 Number of items will be measured on a per item basis.
- .9 Lump Sum items will not be measured for payment.
- .10 When standard manufactured items are identified by their physical characteristics, such characteristics will be considered as nominal. Unless more stringently controlled by specified tolerances, manufacturing tolerances established by the industry involved will be accepted.

**1.3 MEASUREMENT COMPUTATION**

- .1 Formulae and computer programs used for measurement computation will be as specified or, when not specified, as selected by the Owner.

**1.4 MEASUREMENT OF WORK**

- .1 Unless otherwise specified, the Owner will measure the Work for the purpose of determining payment to the Contractor.
- .2 The Owner will request the Contractor to attend with the Owner in making measurements.
- .3 If the Contractor does not attend pursuant to Paragraph 1.4.2, measurements made or approved by the Owner will be considered to be the correct measurement for such part of the Work.

- .4 The Owner will prepare survey records and drawings for payment purposes as the Work progresses. The Owner will request the Contractor to attend, within 14 days, to examine and verify such records and drawings. If the Contractor does not attend to examine and verify such records and drawings, they will be considered to be correct.
- .5 If, after attending pursuant to Paragraph 1.4.2 or 1.4.4, the Contractor disagrees with such measurements or records or drawings, they will nevertheless be considered correct until the Contractor notifies the Owner of the aspects in which they are considered incorrect. On receipt of such notice, the Owner will review the measurements or records or drawings and either confirm or vary them.

**1.5 QUANTITIES**

- .1 Unless otherwise indicated, quantities specified in the Schedule of Prices for Unit Price Work are estimated quantities and will not be considered as actual quantities of Work to be performed. Subject to the Contract terms, unit prices stated in the Schedule of Prices will be applied to actual quantities of Work performed as measured in accordance with the Contract Documents.
- .2 When it is stated that the Contractor will be paid only for the quantity specified for an item of Work, such quantity will be considered as a fixed quantity and the Contractor will be paid for the quantity specified, regardless of the actual quantity performed. If a change in the Work directed by the Owner results in a change in a fixed quantity, the quantity will be adjusted in accordance with the Contract Documents and payment will be made for the adjusted quantity.

**1.6 SCALES**

- .1 Unless otherwise indicated, provide weigh scales, certified by Industry Canada, for measurement purposes.
- .2 Provide scales that are accurate to within 0.5% of correct mass throughout the range of use. Spring balances will not be permitted.
- .3 Prior to use and at any time requested by the Owner, provide the services of a qualified independent person, acceptable to the Owner, for the testing and servicing of weigh scales. Perform baseline tests and record results. Service and adjust weigh scales to meet requirements of Industry Canada and the Contract Documents. Submit a final report of weigh scale tests, services, and adjustments.
- .4 Scales indicating more than true mass will not be permitted to operate and material measured subsequent to the last previous correct accuracy test will be reduced by the percentage of error in excess of 0.5%.
- .5 Scales indicating less than true mass will be adjusted and no additional payment will be made for materials previously scaled and recorded.

**1.7 SCHEDULE OF PRICES**

- .1 The Schedule of Prices is divided into items for purposes of measurement and payment of Work. Price each item in accordance with the methods of measurement specified in the Contract.

- .2 Item names in the Schedule of Prices identify the work covered by the respective item, but do not define the size or nature of the unit.
- .3 Read item names in the Schedule of Prices as part of the item scope, measurement, and payment requirements to which they apply in the Measurement Schedule.
- .4 For each price specified in the Schedule of Prices include all costs and charges required to perform the Work including overhead charges and profit, and all costs of all related Work for which payment is not specified elsewhere.
- .5 Subject to the provisions of the Contract Documents, the total amount of the Schedule of Prices shall cover all of the Contractor's obligations under the Contract and all matters and things necessary for performance of the Work in accordance with the Contract Documents.
- .6 Payment will be made only for items specified in the Schedule of Prices. Costs and charges not directly provided for in the Schedule of Prices will be deemed to be included therein.
- .7 Work or material included in any one item will not also be measured for payment under another item. No item will be paid for more than once.
- .8 Omissions or errors in any item including quantities in the Schedule of Prices will not invalidate the Contract nor release the Contractor from any of his obligations or liabilities under the Contract.

**1.8 LUMP SUM ITEMS**

- .1 Breakdown of Lump Sum Items
  - .1 If requested, submit to the Owner a breakdown of each Lump Sum item included in the Schedule of Prices, within 21 days after the commencement date of the Contract.
  - .2 Provide sufficient details as required by the Owner to identify the principal components of the Work and to permit ready valuation of Work performed.
- .2 Lump Sum Items Paid in Accordance with a Schedule
  - .1 For Mobilization and Demobilization, Existing and Temporary Roads, and Care of Water, where payment of the respective Lump Sum amount will be made in accordance with a schedule as specified in Section 01280 – Measurement Schedule, the measurement of the completed Work by the Owner will include the amount of any work completed for Mobilization and Demobilization, Existing and Temporary Roads, and Care of Water.

**1.9 SCHEDULE OF PRICES – DIVIDED BID ITEMS**

- .1 Where Divided Bid items are included in the Schedule of Prices or the Measurement Schedule, such items shall be excluded from the provisions for variations specified in the General Conditions.
- .2 Include in the Unit Price for the first quantity of the divided item:
  - .1 Costs and profit for each unit of first quantity, and

- .2 Contractor's fixed costs for the total quantity of the divided item specified in the Schedule of Prices plus additional quantities as specified in 1.9.4 Contractor's fixed costs shall include fixed costs for labour, Products, Construction Equipment, Temporary Work and overhead.
- .3 Include in the Unit Price for the quantity of Work over the first quantity, hereinafter called the 'second quantity', cost and profit for each unit of Work, excluding fixed costs included in 1.9.2.2.
- .4 Where the actual total quantity of the Divided Bid item is less than 120% of the estimated total quantity specified in the Schedule of Prices, the Unit Prices bid for the second quantity shall apply to all quantities in excess of the first quantity.
- .5 Where the actual total quantity of the Divided Bid item is more than 120% of the estimated total quantity of the Divided Bid Item, the Contractor's fixed costs per unit of Work shall be calculated by the Owner as follows:

$$\text{Fixed costs per Unit of work} = ((\text{FQUP} - \text{SQUP}) \times \text{FQ}) / \text{TQ}$$

Where:            FQUP – First Quantity Unit Price bid  
                      SQUP – Second Quantity Unit Price bid  
                      FQ – First Quantity in the Schedule of Prices  
                      TQ – Total Quantity in the Schedule of Prices

Payment for the actual quantity which exceeds 120% of the total quantity in the Schedule of Prices shall be based on the Unit Price bid for the second quantity plus the fixed costs calculated by the Owner.

- .6 The Unit Price for the second quantity of Work shall not exceed the Unit Price for the first quantity. Where a Unit Price for the second quantity of Work is greater in amount than the Unit Price for the first quantity, the Unit price and its extension will be corrected by the Owner to the Unit Price of the first quantity. Accordingly, the Bid will be evaluated and the Work will be paid for at the Unit Price of the first quantity. Contractor shall be bound to such corrected amounts.

**2.                    PRODUCTS                    –                    NOT USED**

**3.                    EXECUTION                    –                    NOT USED**

**END OF SECTION**

**1. GENERAL**

Requirements specified in this Section apply to the scope and measurement of work for purposes of determining payment under the Contract.

**1. General Requirements**

- .1 Scope: Includes the following: Table of Contents; Advertisement for Bids; Instructions to Bidders; Bid Security; Information Documents; Unit Price Bid Form; Schedule of Prices; Unit Price Bid Modification Form; Agreement Form; Definitions and Interpretation; Contract Performance Security; Security for Payment Claims; Insurance Conditions; Payment Conditions; Statutory Declaration Form; General Conditions; Supplementary Conditions; Summary of Work; Measurement Rules; Measurement and Payment Schedule; Management and Co-ordination; Contract Meetings; Submittals; Shop Drawings, Product Data and Samples; Environmental Protection; Regulatory Requirements; Work Site Safety; Quality Control and Quality Assurance; Existing and Temporary Utilities; Existing and Temporary Roads; Products and Execution; Product Options and Substitutions; Site Surveying; Final Clean-up; Contract Acceptance Procedures; Contract Record Documents; Care of Water; Traffic Accommodation; Hydro Excavations; and all related work for which payment is not included elsewhere.
- .2 Measurement: General requirements will not be measured for payment.
- .3 Payment: Lump sum payment as follows:
  - .1 When 25% of Schedule A amount is earned, 50% of the lump sum bid for “General Requirements” will be paid.
  - .2 Upon Substantial Performance the unpaid balance of the lump sum bid in the Schedule of Prices for General requirements will be paid.

The total payments for this item shall not exceed the original amount bid for this item regardless if the Contractor may have, for any reason, shut down his work on the project or moved equipment away from the project and then back again.

**2. MEASUREMENT SCHEDULE**

**2.1 EXTRA WORK ALLOWANCES**

**.1 Unforeseen Work:**

- .1 Scope: Includes unforeseen work for which payment is not included elsewhere. Unforeseen work shall be approved by Owner.
- .2 Measurement: Shall be made by the Owner after assessment of the nature of the unforeseen work. Method of measurement, extent of work and the limit of work shall be agreed to prior to commencing the unforeseen work.
- .3 Payment: Shall be made by an approved change order describing the unforeseen work and setting out the method of payment (ie. lump sum, unit price and/or force account). Payment amount shall be taken from the Extra Work Allowance provided for in the Contract.

**2.2 SCHEDULE A – RUNWAY REHABILITATION**

**.1 Crack Repair - Rout and Seal**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to supply and install Crack Routing and Sealing, complete. Work includes routing, cleaning, and drying the cracks, cleaning the pavement surface, supplying and applying crack sealant, quality control and all other related work for which payment is not included elsewhere.

No additional payment will be made for re-routing and sealing of cracks not sealed in accordance with the specifications.

- .2 Measurement: will be on a lineal meter basis of crack routing and sealing completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices

**.2 Crack Repair - Mill and Fill**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to supply and install Crack Mill and Fill, complete. Work includes cold milling, disposal of milled material, supplying and applying prime coat, supplying, placing, and compacting the asphalt mix and all other related work for which payment is not included elsewhere.

- .2 Measurement: will be on a per square meter basis of full depth pavement repair completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefor in the Schedule of Prices.

**.3 Pavement Repair – Full Depth**

- .1 Scope: Provision of all equipment, material, and labour for full-depth repair of asphalt pavement in accordance with site instruction given by the Owner, or Owner's Representative including subgrade preparation, granular material compacted depths, densities, moisture contents and grades; complete. The work includes saw cutting; jack hammering; excavation; waste excavation; loading, hauling and disposal of asphalt materials at the designated disposal site; woven geotextile; base granular materials; proof rolling; watering of granular surfaces; prime and/or tack coats as required; hot-mix asphaltic concrete materials; utility crossings; tipping fees; clean-up; and all related work for which payment is not included elsewhere.

- .2 Measurement: will be on a per square meter basis of full depth pavement repair completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices.

**.4 Tack Coat**

- .1 Scope: Provision of all equipment, materials, and labour to supply and install tack coat, complete. The work includes preparing the asphaltic surfaces; tack coat the surface and vertical faces of asphaltic structure prior to overlay treatment; sand cover if required; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be made on a per square meter basis of tack coat applied to the finished asphalt surface.  
  
No separate measurement will be made for the supply and application of tack coat to the vertical faces of concrete and/or asphaltic structures, or the re-application of due to contamination.
- .3 Payment: Will be at the unit price bid therefore in the Schedule of Prices.

**.5 Hot Mix Asphalt – Type L1**

- .1 Scope: Provision of all equipment, materials and labour required for the supply and installation of hot mix asphaltic concrete in accordance with areas and locations and specified depths by the Owner or Owner's Representative on site, compacted depths, densities, and grades; complete. The work includes supplying, procuring, processing, loading, hauling, placing, shaping, grading, raking, ramping, and compaction of asphaltic concrete; supply and installation of prime and tack coat as required on leveling course; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: will be on a per tonne basis for the leveling course of type L1 hot mix asphalt installed and per square meter basis for overlay. Tonnage to be measured from truck scale tickets. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the square meter and per. tonne unit price bid therefore in the Schedule of Prices.

**.6 Pavement Markings**

- .1 Scope: Provision of all equipment, materials and labor required for supply and installation of paint pavement markings to asphalt surface, complete. The work includes preparation of asphalt surface to receive paint; layout of the pavement markings; paint; application of paint as specified in the Contract Documents; protection of markings; clean up; and all related work for which payment is not included elsewhere.
- .2 Measurement: will be made on a per unit basis for threshold groupings, individual numbers and centerline groupings installed.
- .3 Payment: will be at the unit price bids therefore in the Schedule of Prices.

**.7 100mm HDPE Tile Drain**

- .1 Scope: Provision of all labour material and equipment for the supply and installation of 100mm HPDE tile drain pipe and filter sock, complete. The work includes excavation; waste excavation; pipe materials; fittings; couplers; adaptors; filter sock; rodent guards; nonwoven geotextile; granular materials; clay cap and backfilling; utility crossings; landscape restoration; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be made on a per linear meter basis of 100mm HDPE tile drain pipe installed.
- .3 Payment: Will be at the unit price bid therefor in the Schedule of Prices.

**2.3 SCHEDULE B – TAXIWAY AND APRON REHABILITATION**

**.1 Crack Repair – Rout and Seal**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to supply and install Crack Routing and Sealing, complete. Work includes routing, cleaning, and drying the cracks, cleaning the pavement surface, supplying and applying crack sealant, quality control and all other related work for which payment is not included elsewhere.

No additional payment will be made for re-routing and sealing of cracks not sealed in accordance with the specifications.

- .2 Measurement: will be on a lineal meter basis of crack routing and sealing completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices

**.2 Crack Repair – Mill and Fill**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to supply and install Crack Mill and Fill, complete. Work includes cold milling, disposal of milled material, supplying and applying prime coat, supplying, placing, and compacting the asphalt mix and all other related work for which payment is not included elsewhere.

- .2 Measurement: will be on a per square meter basis of full depth pavement repair completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefor in the Schedule of Prices.

**.3 Pavement Repair – Full Depth**

- .1 Scope: Provision of all equipment, material, and labour for full-depth repair of asphalt pavement in accordance with site instruction given by the Owner, or Owner's Representative including subgrade preparation, granular material compacted depths, densities, moisture contents and grades; complete. The work includes saw cutting; jack hammering; excavation; waste excavation; loading, hauling and disposal of asphalt materials at the designated disposal site; geotextile

fabric; base granular materials; proof rolling; watering of granular surfaces; prime and/or tack coats as required; hot-mix asphaltic concrete materials; utility crossings; tipping fees; clean-up; and all related work for which payment is not included elsewhere.

- .2 Measurement: will be on a per square meter basis of full depth pavement repair completed. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices.

**.4 Tack Coat**

- .1 Scope: Provision of all equipment, materials, and labour to supply and install tack coat, complete. The work includes preparing the asphaltic surfaces; tack coat the surface and vertical faces of asphaltic structure to be overlaid; sand cover if required; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be made on a per square meter basis of tack coat applied to the finished asphalt surface.

No separate measurement will be made for the supply and application of tack coat to the vertical faces of concrete and/or asphaltic structures, or the re-application due to contamination.

- .3 Payment: Will be at the unit price bid therefore in the Schedule of Prices.

**.5 Hot Mix Asphalt – Type L1**

- .1 Scope: Provision of all equipment, materials and labour required for the supply and installation of hot mix asphaltic concrete in accordance with areas and locations and specified depths by the Owner or Owner's Representative on site, compacted depths, densities, and grades; complete. The work includes supplying, procuring, processing, loading, hauling, placing, shaping, grading, raking, ramping, and compaction of asphaltic concrete; supply and installation of prime and tack coat as required on leveling course; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: will be on a per tonne basis for the leveling course of type L1 hot mix asphalt installed and per square meter basis for overlay. Tonnage to be measured from truck scale tickets. Note this item is an allowance and may not be fully utilized.
- .3 Payment: will be at the square meter and per. tonne unit price bid therefore in the Schedule of Prices.

**.6 Pavement Markings**

- .1 Scope: Provision of all equipment, materials and labor required for supply and installation of paint pavement markings to asphalt surface, complete. The work includes preparation of asphalt surface to receive paint; layout of the pavement markings; application of paint; protection of markings; clean up; and all related work for which payment is not included elsewhere.

- .2 Measurement: will be made on a per unit basis for apron markings and per lineal meter of taxiway centerline installed.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices.

**.7 Tiedown Anchors**

- .1 Scope: Provision of all equipment, materials and labor required for supply and installation of airplane tiedown anchors, complete. The work includes, layout, saw cutting, removals, waste excavation, tiedown rods and installation, formwork, concrete, granular base, moisture conditioning, compaction, prime coat, hot mix asphalt, tack coat, clean up; and all related work for which payment is not included elsewhere.
- .2 Measurement: will be made on a per unit basis for each tiedown anchor installed.
- .3 Payment: will be at the unit price bid therefore in the Schedule of Prices.

**SCHEDULE C – LIGHTING UPGRADES**

**.1 Decommission and Remove Existing Equipment**

- .1 Scope: Includes but is not limited to all labour, material, and equipment for decommissioning of all existing equipment, removal and disposal of existing airport lights, light supports, wind cone, etc. Removal of pull pits and their contents, cutoff and abandonment of underground cable, fill-in of pull pit voids, coordination with airport operator to minimize downtime of airport usage, and other related work for which payment is not included elsewhere.
- .2 Measurement: No separate measurement.
- .3 Payment: Lump sum payment.

**.2 Lighting**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to supply and install all runway, taxiway, apron lights and rotating beacon for the airport as specified in the drawings, including power supply, controls (manual switch, photocell), pull pits, bases, conduit/wire, conduit excavation, conduit bedding/backfill, landscape restoration and other related work for which payment is not included elsewhere.
- .2 Measurement: No separate measurement.
- .3 Payment: Lump sum payment.

**.3 Wind Cone**

- .1 Scope: Includes but is not limited to all labour, material, and equipment to relocate the existing wind cone as specified on drawings, associated conduit/wire, internal lights, concrete foundation, excavation, bedding/backfill, and other related work for which payment is not included elsewhere.
- .2 Measurement: No separate measurement.
- .3 Payment: Lump sum payment.

**.4 Hydro Excavation Allowance**

- .1 Scope: Provision of all labour, material and equipment required for exposing of existing utilities that will be crossed or tied into by the underground utilities installation work, complete. The work includes locates; hydro excavation; water; waste excavation; measurement and recording of the utility information; sand backfill; protection of hydro excavation; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be on an hourly basis, as specified in the Schedule of Prices.  
  
Measurement will be made for the hours of hydro excavation work while onsite.  
  
No measurement will be made for travel time “to” or “from” the site; No measurement will be made for re-locating or re-exposing of hydro excavated utilities already measured for payment.  
  
This payment item is an allowance whereby no additional payment will be made unless authorized by the Owner’s representative.
- .3 Payment: Will be at the unit price bid therefor in the Schedule of Prices.

**SCHEDULE D – DRAINAGE IMPROVEMENTS ALLOWANCE**

**.1 Topsoil Stripping**

- .1 Scope: Provision of all equipment, material and labour required to strip and stockpile up to 200mm depth of topsoil, complete. The work includes excavating, loading, hauling, and stockpiling of existing topsoil; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be made on a per square metre basis of up to 200 mm depth of topsoil removed.
- .3 Payment: Will be at the unit price bid therefor in the Schedule of Prices.

**.2 Waste Excavation**

- .1 Scope: Provision of all equipment, material and labour required for waste excavation, complete. The work includes excavating; loading, hauling, placing, and disposal of unsuitable waste excavation material; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be on a per cubic metre basis of waste excavation, determined by surveys and volume calculations.
- .3 Payment: Will be at the unit price bid therefor in the Schedule of Prices.

No separate payment will be made for unnecessary excavation or excavation work performed beyond established lines or grades unless otherwise authorized by the Owners Representative.

No separate payment will be made for waste excavation created by or as a result of the supply and installation of pipe, granular bedding and haunching material, manholes and catch basins.

No separate payment will be made for damages or for unstable soil conditions caused by surface drainage after the commencement of construction and during maintenance period.

**.3 Topsoil Placement, Hydromulch and Grass Seed**

- .1 Scope: Provision of all equipment, material, and labour for the placement of 150mm depth of topsoil, hydro mulch and grass seed, complete. The work includes loading, hauling, placing, grading, disking, and preparation of stockpiled and import topsoil; fertilizing; hydro mulch; seeding; initial watering; clean-up; and all related work for which payment is not included elsewhere.
- .2 Measurement: Will be on a per square metre basis of 150mm topsoil, hydro mulch, and coulee seed within the designated limits.
- .3 Payment: Will be at the unit price bid therefor in the Schedule of Prices.

**END OF SECTION**

**1. GENERAL**

**1.1 CO-ORDINATION**

- .1 Co-ordinate all construction activities to provide efficient and orderly construction of each and every part of the Work.
- .2 Where construction of one part of the Work is dependent on construction of other parts, schedule and co-ordinate construction activities in the sequence needed to obtain the best results.
- .3 Where availability of space is limited, co-ordinate construction of different parts of the Work to provide maximum accessibility for maintenance, service, and repair.
- .4 Make adequate provisions to accommodate Work scheduled for later construction by Other Contractors or by the Owner's own forces.

**1.2 COMMUNICATION EQUIPMENT**

- .1 Provide suitable computer equipment and software at the Contractor's office specified in this section for exchange of electronic data by e-mail of the following types of documents:
  - .1 Letters and Memos Microsoft® Word
  - .2 Document Readers Adobe Acrobat® Reader
  - .3 Schedules Microsoft® Project
  - .4 Drawings AutoCAD®
  - .5 Communication Microsoft® Outlook

**1.3 COMMUNICATION METHODS**

- .1 Communications will be sufficiently given by any one of the following methods:
  - .1 Delivered personally to the Contractor, the Contractor's representative, or left at the Contractor's address as specified in this section.
  - .2 Mailed at any post office to the Contractor's address as specified in this section.
  - .3 Couriered to the Contractor's address as specified in this section.
  - .4 Transmitted by facsimile to the Contractor's facsimile number as specified in this section.
  - .5 Transmitted by Internet to the Contractor's e-mail address as specified in this section.

**1.4 CONTRACT ADMINISTRATION**

- .1 Co-ordinate scheduling and timing of administrative procedures with other construction activities to avoid delays and provide orderly progress of the Work. Administrative procedures include the following:

- .1 Preparation and monitoring of schedules.
- .2 Co-ordination of construction and removal of temporary facilities.
- .3 Co-ordination, review, and processing of submittals.
- .4 Participation in project meetings.
- .5 Following Contract acceptance procedures.
- .6 Preparation of change order proposals.

**1.5 CONTRACTOR’S ADDRESS FOR CORRESPONDENCE**

- .1 Submit the name, address, telephone number, facsimile number, and e-mail address to be used for correspondence with the Contractor within 10 days of the date of commencement of the Contract. Update whenever information changes during the Contract.

**1.6 OWNER’S ADDRESS FOR CORRESPONDENCE**

- .1 The Owner will provide to the Contractor the name, address, telephone number, facsimile number, and e-mail address to be used for correspondence with the Owner within 10 days of the date of commencement of the Contract. This information will be updated as required during the Contract.

**1.7 CONTRACTOR’S REPRESENTATIVES AND SITE MANAGEMENT**

- .1 Submit an organization chart showing the names, positions, telephone numbers, and responsibilities and levels of authority for the Contractor’s representatives and site management organization, within 10 days of the date of commencement of the Contract, and update whenever information changes during the Contract.

**1.8 OWNER’S REPRESENTATIVES AND ASSISTANTS**

- .1 The Owner will provide to the Contractor an organization chart showing the names, positions, telephone numbers, and responsibilities and levels of authority for the Owner’s Representative and assistants, within 10 days of the date of commencement of the Contract, and will update whenever information changes during the Contract.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 ADMINISTRATIVE RESPONSIBILITIES**

- .1 The Owner will be responsible for administrative requirements for the following Contract meetings:
  - .1 Pre-construction
  - .2 Construction Progress
  - .3 Environment
- .2 The Contractor shall be responsible for administrative requirements for the following Contract meetings:
  - .1 Workplace Orientation
  - .2 Safety
- .3 The Owner or the Contractor may request additional meetings related to installation of equipment, commissioning progress, warranty, dispute resolution, environmental issues. Unless otherwise specifically requested by the Contractor, the Owner will be responsible for administrative duties related to these meetings. The agenda for these meetings may be combined with that of the construction progress meetings.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- .1 The administrative requirements for Contract meetings include the following:
  - .1 Scheduling and administering the Contract meetings throughout the progress of the Work.
  - .2 Preparing the agenda for the meetings.
  - .3 Distributing to the relevant attendees written notice of each meeting and the proposed agenda at least 3 days in advance of the meeting date.
  - .4 Presiding at the meetings.
  - .5 Recording the minutes including attendance, significant proceedings and decisions, and action required by the parties.
  - .6 Reproducing and distributing copies of the minutes within 7 days after each meeting to the meeting participants and affected parties not in attendance.
- .2 Representatives of the Contractor, Subcontractors, and Suppliers shall attend meetings as necessary and be authorized to act on behalf of the party each represents.

**1.3 PRE-CONSTRUCTION MEETING**

- .1 Frequency: Within 15 days after award of the Contract and prior to commencement of activities at the Site.

- .2 Purpose: To review personnel assignments, responsibilities, schedules, submissions, and administrative and procedural requirements.
- .3 Attendees:
  - .1 Contractor's representatives: senior management, site superintendent, major Subcontractors, and others as necessary.
  - .2 Owner's representatives: as determined by the Owner.
- .4 Agenda may include the following:
  - .1 Appointment of representatives of participants in the Work.
  - .2 Schedule of the Work and progress scheduling.
  - .3 Schedule of submittals.
  - .4 Requirements for temporary facilities, site signage, offices, storage sheds, utilities, and fences.
  - .5 Schedule of equipment delivery.
  - .6 Site safety and security.
  - .7 Contemplated changes, change orders, approvals required, costing and mark-up percentages permitted, time extensions, overtime, and administrative requirements.
  - .8 Products and materials provided by the Owner.
  - .9 Record documents.
  - .10 Maintenance manuals.
  - .11 Takeover procedures, acceptance, and warranties.
  - .12 Monthly progress claims, administrative procedures, and holdbacks.
  - .13 Inspection and testing.
  - .14 Insurance and transcripts of policies.
  - .15 Environmental management principles.
  - .16 Mobilization to the Site.

**1.4 CONSTRUCTION PROGRESS MEETINGS**

- .1 Frequency: Weekly during the course of the Work.
- .2 Purpose: To monitor construction progress, to identify problems and actions required for their solution, and to expedite the Work.

- .3 Attendees:
  - .1 Contractor's representatives: site superintendent and, when so requested by the Owner, Subcontractors, Suppliers, and other parties involved in the Work.
  - .2 Owner's representatives: as determined by the Owner.
- .4 Agenda may include the following:
  - .1 Review and approval of minutes of the previous meeting.
  - .2 Review of the Work progress since the previous meeting.
  - .3 Field observations, problems, and conflicts.
  - .4 Problems that impede the construction schedule.
  - .5 Off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain the Contract schedule.
  - .7 Revisions to the construction schedule.
  - .8 Progress and schedule for the succeeding work period.
  - .9 Submittal schedules.
  - .10 Adherence to quality standards.
  - .11 Contemplated changes effect on the construction schedule and Contract Time.
  - .12 Contentious items of the Work.
  - .13 Contract closeout issues.
  - .14 Safety and security issues.
  - .15 Environmental issues.
  - .16 Other business.

**1.5 WORKPLACE ORIENTATION MEETINGS**

- .1 Frequency: As required for all new workers prior to commencement of Work on the Site.
- .2 Purpose: To familiarize new workers with site conditions, rules, regulations, safety, and security requirements.
- .3 Attendees: All new Contractor and Owner personnel scheduled to work on the Site.
- .4 Agenda may include the following:
  - .1 Project description including areas of work and other concurrent construction contracts.

- .2 Hazardous areas including open excavations, construction equipment traffic, blasting, and chemical or explosive storage, etc.
- .3 Safety equipment to be worn by workers, including areas with special requirements.
- .4 Traffic routes on the Site.
- .5 Evacuation procedures.
- .6 First aid procedures.
- .7 Excavation or work permit procedures.
- .8 WHMIS (Workplace Hazardous Materials Information System) requirements for handling and storage of chemicals.
- .9 Fire safety rules and regulations.
- .10 Rules and regulations regarding wildlife, environmental concerns, drugs, alcohol, etc.

**1.6 SAFETY MEETINGS**

- .1 Frequency: Weekly during the course of the Work for each area of work.
- .2 Purpose: To review safety concerns and implement preventive safety measures.
- .3 Attendees: Contractor's and Owner's personnel for each area of work.
- .4 Agenda may include the following:
  - .1 Review and discussion of safety concerns, accidents, and "near misses."
  - .2 Remedial or preventive actions to be taken.

**1.7 ENVIRONMENTAL MEETINGS**

- .1 Frequency: During the course of Work, schedule environment meetings weekly or as required by the Owner to deal with issues that may arise. Dependent on the issues, the Owner may combine the agenda for environmental meetings with that of the construction progress meetings.
- .2 Purpose: To review environment issues and implement mitigative measures.
- .3 Attendees:
  - .1 Contractor's representatives: Contractor's site superintendent and when so requested by Owner, subcontractors, suppliers and other parties involved in the Work. Contractor's representatives shall be qualified and authorized to act on behalf of the party each represents.
  - .2 Owner's representatives: as determined by Owner.

- .4 Agenda to include the following:
  - .1 Review and discussion of environment concerns, accidents and “near misses”.
  - .2 Identify environmental emergency notification procedures.
  - .3 Identify remedial or preventative action to be taken.
- .5 All employees must attend environmental orientation.

2. **PRODUCTS** – **NOT USED**

3. **EXECUTION** – **NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 DEFINITIONS**

- .1 “Administrative Submittals” means data presented for review to ensure administrative requirements of the Contract are met.
- .2 “Shop Drawings” means technical data specifically prepared for work of this Contract including drawings, diagrams, schedules, templates, patterns, and similar information not in standard printed form.
- .3 “Product Data” means standard printed information describing materials, products, equipment, and systems not specifically prepared for work of this Contract. Product Data consisting of manufacturers’ standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations, and descriptive data will be accepted in lieu of Shop Drawings provided that:
  - .1 Information not applicable to the work of this Contract is deleted; and
  - .2 Standard information is supplemented with information specifically applicable to the Work of this Contract.
- .4 “Samples” means cuts or containers of materials or partial sections of manufactured or fabricated components that are physically identical to products proposed for use.
- .5 “Field Samples” means volumes of materials as specified, which are physically representative of the materials proposed for use.

**1.2 SCHEDULE OF SUBMITTALS**

- .1 Submittals required for the Contract are specified in each section of the Contract Documents.
- .2 Submittals required by this section are appended to this section.

**1.3 SUBMITTAL PREPARATION**

- .1 Determine and verify:
  - .1 Field measurements.
  - .2 Field construction criteria.
  - .3 Catalogue numbers and similar data.
  - .4 Compliance with the Contract Documents.
- .2 Co-ordinate each submittal with requirements of the Work and the Contract Documents.
- .3 Notify the Owner, in writing, on the submittal and at the time of submission, of any deviations from the requirements of the Contract Documents.

#### 1.4 SUBMITTAL REQUIREMENTS

- .1 Make submittals within the times required by the Contract Documents and sufficiently in advance of the date that reviewed submittals will be required, and in such sequence as to cause no delay in the Work.
- .2 Make submittals in the form specified or in a form considered as an industry standard.
- .3 Provide a transmittal letter with each submittal containing:
  - .1 Date.
  - .2 Project Name.
  - .3 Contract Name.
  - .4 Tender Number.
  - .5 Contractor's name and address.
  - .6 Number of each Shop Drawing, Product Data, and Sample submitted.
  - .7 Other pertinent data.
- .4 Include in the submittals:
  - .1 Date and revision dates.
  - .2 Project Name.
  - .3 Contract Name.
  - .4 Tender Number.
  - .5 Name of:
    - .1 Contractor.
    - .2 Subcontractor.
    - .3 Supplier.
    - .4 Manufacturer.
    - .5 Name of detailer when details are not prepared by the Contractor, Subcontractor, or Supplier.
  - .6 The Contractor's stamp, signed, certifying its review of the submittal, verification of field measurements, and compliance with the Contract Documents, or that deviations, if incorporated, will be compatible with other elements of the Work.

#### 1.5 REVIEW OF SUBMITTALS

- .1 The Owner will review each submittal within 10 working days of receipt of the submittal unless specified otherwise in the Contract Documents.

- .2 Make corrections or changes to reviewed submittals and resubmit as specified for the initial submission.
- .3 Until a reviewed submittal is received, do not proceed with the Work related to the submittal.
- .4 The Owner's review of any submittal does not relieve the Contractor from responsibility for errors and omissions, nor deviations from the requirements of the Contract Documents.

**1.6 CASH FLOW FORECAST**

- .1 Submit to Owner for review, 15 days before submission of first application for payment, a forecast of approximate progress payments for the duration of the Contract.
- .2 Submit revised cash flow forecasts of progress payments as the Work progresses and as requested by Owner.

**1.7 LIST OF SUPPLIERS**

- .1 Submit a list of suppliers to Owner for review 15 days prior to commencement of activities at the Site.
- .2 Submit revised list of suppliers as the work progresses and as requested by the Owner.

**1.8 LIST OF CONSTRUCTION EQUIPMENT**

- .1 Submit a list of construction equipment to Owner for review 15 days prior to commencement of activities at the Site.
- .2 Submit revised list of construction equipment as the work progresses and as requested by the Owner.

**1.9 SCHEDULE OF WORKERS**

- .1 Not applicable.

**1.10 SITE MANAGEMENT PERSONNEL**

- .1 Submit a list of site management personnel to Owner for review 15 days prior to commencement of activities at the Site.
- .2 Submit revised site management personnel as the work progresses and as requested by the Owner.

**1.11 PHOTOGRAPHS**

- .1 Submit digital copies of all pre-construction and post construction photographs within project areas.

**1.12 CONSTRUCTION NOTIFICATIONS - PUBLIC**

- .1 Seven days prior to construction, notify all affected businesses, institutions, facilities and residents informing them in writing of the nature of the work to be performed, how long the inconvenience will last, who to contact in the event of damages to the home, business

or property, and what to do for access and alternative parking arrangements. The Contractor shall submit the proposed notification to the Owner's Representative for review before issuance.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

- .1 Submit for review, shop drawings, product data and samples called for by the Contract Documents and for such other items as the Owner's Representative may reasonably request.
- .2 Until submittal is reviewed, do not proceed with work involving the relevant product.

**2. SHOP DRAWINGS**

- .1 Shop drawings means technical data specially prepared for work of this Contract; including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form.
- .2 Present shop drawings in a clear and thorough manner to appropriately illustrate the work.
- .3 Identify field dimensions on drawings.
- .4 Identify shop drawings by appropriate references to sheet, detail, schedule or room numbers.
- .5 Maximum drawing size: 860 × 1120 mm.
- .6 Leave a clear space of 100 mm × 75 mm on each sheet of shop drawings for placement of Engineer's review stamp.
- .7 Submit PDFs for each required shop drawing.

**3. PRODUCT DATA**

- .1 Product data means standard printed information describing materials, products, equipment and systems; not specially prepared for work of this Contract, other than the designation of selections.
- .2 Clearly mark product data to identify products.
- .3 Manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and descriptive data will be accepted in lieu of shop drawings provided that:
  - .1 Information not applicable to work of this Contract is deleted, and
  - .2 Standard information is supplemented with information specifically applicable to the work of this Contract.
- .4 Submit clear reproducible information in PDF format.

**4. SAMPLES**

- .1 Samples means cuts or containers of materials or partial sections of manufactured or fabricated components which are physically identical to products proposed for use and which establish minimum standards by which the work will be judged.
- .2 Label samples as to origin and intended use in the Work.

**5. SUBMITTAL PREPARATION**

- .1 Review, date and sign, shop drawings, product data and samples, prior to submission.
- .2 Determine and verify:
  - .1 Field measurements.
  - .2 Field construction criteria.
  - .3 Catalogue numbers and similar data.
  - .4 Conformance with Contract Documents.
- .3 Coordinate each submittal with requirements of work and Contract documents. Individual drawings will not be reviewed until all related shop drawing and product data are available.
- .4 Notify Owner's Representative, in writing, on the submittal and at the time of submission, of deviations from requirements of Contract Documents.

**6. SUBMISSION REQUIREMENTS**

- .1 Make submittals sufficiently in advance of date that reviewed submittals will be required and in such sequence as to cause no delay in the Work.
- .2 Accompany submittals with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Number of each shop drawing, product data and sample submitted.
  - .5 Other pertinent data.
- .3 Submittals shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name of:

- .1 Contractor.
  - .2 Subcontractor.
  - .3 Supplier.
  - .4 Manufacturer.
  - .5 Name of detailer when details not prepared by Contractor, sub-contractor, or supplier.
- .4 Contractor's stamp, initialed or signed, certifying review of submittal, verification of field measurements, and compliance with Contract Documents.
- .4 Make corrections or changes to rejected submittals and resubmit, as specified for initial submission.

**7. RESPONSIBILITY FOR ERRORS, OMISSIONS AND DEVIATIONS**

- .1 Owner's Representative's review of submittals does not relieve Contractor from responsibility for errors and omissions, nor deviations from requirements of the Contract Documents.

**8. REPRODUCTION OF SUBMITTALS**

- .1 After final review, Owner's Representative will reproduce at his expense, the number of copies he requires, and return reviewed reproducible documents. Contractor shall reproduce at his expense the number of copies required for performance of the Work.

**END OF SECTION**

**1. GENERAL**

**1.1 ENVIRONMENTAL LEGISLATION**

- .1 Adhere to the latest editions of all applicable federal, provincial and municipal legislation, regulations and Codes of Practice concerning environmental protection and conduct activities in accordance with such legislation, codes and regulations. This includes but not necessarily limited to, the provincial Environmental Protection and Enhancement Act and Water Act; and the federal Fisheries Act and Navigable Waters Protection Act.
- .2 In the event of conflicting statements between the various Acts, Authorizations, Permits, and Codes of Practice, the more stringent requirement shall apply.
- .3 The Owner will obtain the environmental approvals, permits, licences, and authorizations required for the Project.
- .4 Comply with the conditions of all environmental approvals, permits, licences and authorizations issued for the Contract. Obtain any further environmental approvals, permits, licences and authorizations for temporary work as may be required for the Contract.
- .5 Provide the Owner with written confirmation of Contractor's full compliance with all approvals, permits, licences and authorizations before the Final Mobilization / Demobilization payment is released.
- .6 Keep on Site copies of approvals, permits, licences and authorizations. Make these documents readily available to authorized persons at the Site. Keep documents on Site until the date of Warranty Performance of the Work or at such earlier dates accepted by the Owner.

**1.2 ENVIRONMENTAL CONSTRUCTION OPERATIONS (ECO) PLAN**

- .1 Prepare, submit and implement an Environmental Construction Operations (ECO) Plan for each phase of the Contract in accordance with the Alberta Transportation's manual entitled "Environmental Construction Operations (ECO) Plan Framework," (most current edition). Completed ECO Plans consist of written procedures and drawings that address the environmental protection issues relevant to the site specific activity being performed and shall detail temporary environmental control measures that the Contractor undertakes to comply with all applicable approvals, permits, licenses and authorizations during the course of construction and during "winter shut down," and other similar "shut downs."
- .2 Prepare the ECO Plan specific to the Work and the Site. Ensure effective implementation of the ECO Plan by assigning responsibility for the implementation, and maintenance of the work prescribed by the ECO Plan, including temporary erosion control measures, to one individual, herein called the work zone representative. The work zone representative shall be identified at the pre-construction meeting.
- .3 The ECO Plan shall not cover any permanent or long term environmental or erosion control devices or work specified in the Contract.
- .4 Submit the ECO Plan to the Owner at least 14 calendar days prior to the pre-construction meeting. The Owner will review the ECO Plan and communicate any concerns to the Contractor at least seven calendar days prior to the pre-construction meeting. Address any

issues or concerns regarding the proposed ECO Plan to the satisfaction of the Owner prior to the commencement of the Work.

- .5 Finalized ECO Plans shall be agreed to by all parties and shall be signed by the Contractor's 'Principal-In-Charge' and the Contractor's work zone representative before the commencement of Work. If the Contractor's work zone representative changes; provide a letter of acknowledgement to the Owner indicating that the new work zone representative has reviewed the ECO Plan and will comply with its requirements.
- .6 The finalization of the ECO Plan to the mutual satisfaction of the Owner and the Contractor does not constitute an approval or assurance from the Owner to Provincial or Federal Regulatory Agencies that the "temporary environmental control measures" detailed in the ECO Plan are sufficient to ensure compliance with all applicable permits legislation, regulations or conditions of approval. The Contractor is ultimately responsible to ensure all measures, used on the Work, are sufficient to ensure compliance with all applicable authorities. This may mean increasing the number of installations, providing alternate devices or modifying procedures.
- .7 If at any time during the performance of the Work of the contract, it is determined that the devices or procedures detailed in the ECO Plan (any specific measures, locations or quantities proposed) are inappropriate or insufficient, the Owner will notify the Contractor in writing and the ECO Plan shall be modified accordingly, and resubmitted in a timely manner for Owner's approval..
- .8 The Owner may suspend work in cases where in the Owner's opinion the Contractor fails to comply with procedures stated in the ECO Plan. If the Contractor fails to adhere to finalized ECO Plans, or fails to address the concerns the Owner has given the Contractor (in writing) within seven days of notification, the Owner may make other arrangements to have the work done, and deduct the cost thereof from any money owing to the Contractor.
- .9 The cost of preparing the ECO Plan and the performance of all Work necessary to ensure compliance with the ECO Plan and applicable legislation, regulations or conditions of approval will be incidental to the Work and will not be paid for separately.

### **1.3 ENVIRONMENTAL RESOURCE PROTECTION**

- .1 Surficial Aquatic Resources:
  - .1 Protect fish and fish habitat in rivers, streams, and other surface bodies of water located within the Site in accordance with the Contract Documents and Regulatory Requirements.
  - .2 Unless otherwise provided for in the Contract Documents, do not divert, alter, or disrupt water flows in rivers, streams, and other surface bodies of water.
  - .3 Prevent bark, slash, wood chips, sawdust, ashes, organic debris, topsoil, fuel and lubricants, or other substances harmful to aquatic life from entering a river, stream, or other surface bodies of water.
  - .4 Do not perform construction operations within the wetted perimeter of a river, stream, and other surface bodies of water unless such work is part of the Permanent Work or Temporary Work.

- .5 Manage construction operations to limit equipment crossings of rivers and streams and prevent turbidity and siltation during crossings. Install temporary culverts or bridge structures where frequent crossings are required.
  - .6 Use clean granular fill with less than 5% fines passing the 80µm sieve size when exposed to a river or stream for Temporary Work such as cofferdams, causeways, and access ramps. Fine-grained soils may be used, provided only clean granular fill is exposed to the body of water at any time during construction and restoration operations.
  - .7 Remove Temporary Work, including culverts and bridges, and reclaim river and stream banks and bed, and other disturbed areas, prior to attaining Substantial Performance of the Work unless specified otherwise.
- .2 Ground Water Resources:
- .1 Do not change ground water levels in wells located on adjacent lands.
  - .2 Do not change ground water quality in adjacent landowner wells.
- .3 Wildlife Management:
- .1 Do not allow pets on the Site.
  - .2 Do not allow firearms, hunting, or shooting on the Site.
  - .3 Prevent livestock from entering the Site by installing new fences as specified in the Contract Documents; and temporary fences as necessary.
  - .4 Do not harass wildlife.
- .4 Vegetation and Weed Control:
- .1 Remove or control existing and new adverse vegetation that affects adjacent landowners and their croplands, lawn or landscaping, construction operations, or the function of the Permanent Work.
  - .2 Do not import any materials to the Site that are contaminated with weed seeds. Clean dirty construction and reclamation equipment prior to mobilization, to prevent importing weed seeds.
  - .3 Notify the Owner prior to commencing adverse vegetation control measures.
  - .4 Be responsible for damage to crops, lawns or other vegetation, both on and off the Site, resulting from the Contractor's use of herbicides, or other adverse vegetation control measures.
  - .5 Maintain records of the types and amounts of herbicides purchased, delivered, stored, mixed, and used, and the means of disposal of all excess. Maintain the records current and accurate, and make them available for review by the Owner.
  - .6 Monitor the site for early detection of weed growth during the growing season.

- .7 Control weeds once by mechanical equipment before they go to seed, but not before August 1, and at no extra cost to the Owner.
- .5 Historical and Archaeological Resources:
  - .1 Protect known heritage resources specified in the Contract Documents with the specified fencing and marking devices.
  - .2 Protect new heritage resources found during the Contract work. Flag an area of 15 m beyond the edge, and surrounding, a new found heritage resource, and report the finding immediately to the Owner.
  - .3 Additional works required to protect new found heritage resources will be authorized by Change Order and valued in accordance with Section 00725 – General Conditions, Article 8.3 – Valuation of Changes in the Work.
- .6 Socio-Economic Considerations:
  - .1 Prevent the discharge of atmospheric contaminants from construction operations in accordance with Regulatory Requirements.
  - .2 Do not operate equipment, including Construction Equipment that shows excessive emissions of exhaust gases, or fluid leaks, until corrective repairs or adjustments are made.
  - .3 Control dust on the Site, and prevent dust from the Site from damaging crops, orchards, cultivated fields, and dwellings, or causing a nuisance to persons. Be responsible for damages from dust caused by construction operations.
  - .4 Direct all stationary floodlights to shine downward at an angle less than horizontal. Provide shielding for all floodlights and do not direct at residences.

#### **1.4 GENERAL ENVIRONMENTAL PROTECTION REQUIREMENTS**

- .1 Reporting:
  - .1 Spills or releases of hazardous materials and any other substances that cause or could cause impairment of, or damage to the environment or human health or safety shall be immediately reported to the Owner as well as applicable Regulatory Agencies; and remediation measures undertaken as required and legislated.
- .2 Silt Fence Management:
  - .1 Be responsible for and maintain silt fences until date of Warranty Performance of the Work.
  - .2 Inspect silt fencing at intervals appropriate to weather events. Based on inspections maintain silt fencing in functional condition, remove silt accumulations and dispose on site at locations acceptable to the Owner.
  - .3 Unless otherwise specified in the Contract Documents, or otherwise requested by the Owner, remove temporary silt fencing within 30 days after date of Warranty Performance of the Work.

- .3 Waste Management:
  - .1 Remove construction waste, including demolition waste, from the Site unless otherwise specified. Dispose of such waste at the waste disposal facility identified in the Environmental Management Plan.
  - .2 Do not burn, bury or otherwise discharge construction or demolition waste on the Site unless specified otherwise.
  - .3 When practical, minimize the amount of waste generated from construction operations and demolitions by salvaging materials for recycling. Salvage and segregate metal, plastic, paper, cardboard, and glass and transfer them to the nearest appropriate collection facility.
- .4 Hazardous Materials:
  - .1 Transport hazardous materials to and from the Site in accordance with Regulatory Requirements.
  - .2 Use and store hazardous materials in accordance with Regulatory Requirements.
  - .3 Take all reasonable measures to contain spills, remove spilled materials, and cleanup as required in accordance with the applicable legislation and regulations, at the contractor's expense.
- .5 Handling of Construction Equipment Fuels and Lubricants:
  - .1 Employ persons qualified to handle construction equipment fuels and lubricants.
  - .2 Carry the following protection materials in all fuel and service vehicles:
    - .1 10 kg of suitable sorbant material.
    - .2 30 m<sup>2</sup> of 6 mil polyethylene.
    - .3 A shovel.
    - .4 An empty fuel barrel with the lid removed.
  - .3 Maintain a setback distance of 100 m between stored Construction Equipment fuels and lubricants and rivers, streams, and other surface bodies of water.
  - .4 Prevent handling and fuelling operations from contaminating the ground, surface water, and ground water. Use containment berms and an impermeable base course or other system during fueling operations, in order to contain possible spilled fuel.
  - .5 Clearly mark and barricade fuel storage areas and non-portable transfer lines. Use markers that are visible under all weather conditions.
  - .6 Store waste Construction Equipment lubricants in a tank or closed container, and dispose of off-site in accordance with the Regulatory Requirements.

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2. PRODUCTS - NOT USED

3. EXECUTION - NOT USED

END OF SECTION

**1. GENERAL**

**1.1 REGULATORY RESPONSIBILITY**

- .1 Conform to Regulatory Requirements and pay all fees and give all notices required by them.
- .2 Obtain approvals necessary for the Work and the Contract from the regulatory agencies having jurisdiction, except those approvals obtained by the Owner as identified in this section.
- .3 The Owner will obtain the approvals necessary for the Project that involve agreement between the Owner and the regulatory agency having jurisdiction.

**1.2 VARIATIONS BETWEEN THE CONTRACT DOCUMENTS AND THE REGULATORY REQUIREMENTS**

- .1 If the Contract Documents are at variance with Regulatory Requirements, notify the Owner in writing, requesting direction, immediately after such variance becomes known.
- .2 The Owner may make Changes in the Work due to Regulatory Requirements, and such changes will be authorized by Change Order and valued in accordance with Section 00725 – General Conditions, Article 8.3 – Valuation of Changes in the Work.
- .3 If the Contractor fails to notify the Owner in writing and obtain the Owner’s direction related to variations in Regulatory Requirements and performs work knowing it to be contrary to Regulatory Requirements, the Contractor accepts responsibility for correcting violations thereof, and bears the costs, expenses, and damages attributable to the Contractor’s failure to comply with the provisions of such Regulatory Requirements.

**1.3 CONTRACT DOCUMENTS**

- .1 Contractor shall not be responsible for verifying that Contract Documents comply with regulatory requirements. If Contract Documents are at variance therewith, or changes which require modification to Contract Documents are made to regulatory requirements, by authorities having jurisdiction, subsequent to date of tender closing, Contractor shall notify Owner’s Representative in writing, requesting direction, immediately such variance or change becomes known to him. Owner’s Representative may make changes required to Contract Documents and any resulting change in Contract Price or Contract Time will be made in accordance with the General Conditions of Contract.
- .2 If Contractor fails to notify Owner’s Representative in writing and obtain Owner’s Representative’s direction as required in paragraph 1.3.1 and performs work knowing it to be contrary to regulatory requirements, Contractor shall be responsible for and shall correct violations thereof and shall bear costs, expenses and damages attributable to his failure to comply with provisions of such regulatory requirements.

**1.4 ALBERTA BUILDING CODE**

- .1 Conform to and perform work in accordance with the Alberta Building Code, except as otherwise indicated in Contract Documents.

**1.5 PERMITS**

- .1 Development Permit: Owner will apply for, obtain, and pay for development permit if required.
- .2 Building Permit:
  - .1 Apply for, obtain and pay for building permit and other permits required for the Work and its various parts.
  - .2 Display the building permit and such other permits in a conspicuous location at the Place of the Work.
- .3 Occupancy Permits:
  - .1 Where required by authority having jurisdiction, apply for, obtain, and pay for occupancy permits, including partial occupancy permits.
  - .2 Where Contract Document deficiencies are required to be corrected in order to obtain occupancy permits, including partial occupancy permits, Owner's Representative will issue appropriate instructions to correct the Work.
  - .3 Turn occupancy permits over to Owner's Representative.

**1.6 LINEAR LAND RECLAMATION**

- .1 Adhere to all requirements as stipulated by Alberta Environment and Parks relative to linear land reclamation of pipeline right of ways.

**2. PRODUCTS - NOT USED**

**3. EXECUTION - NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 WORK SITE SAFETY – THIS CONTRACTOR IS “PRIME CONTRACTOR”**

- .1 For the purposes of the *Occupational Health and Safety Act* (Alberta), and for the duration of the Work of this Contract:
  - .1 Be the “prime contractor” for the “work site”; and
  - .2 Do everything that is reasonably practicable to establish and maintain a system or process that complies with the Act and its regulations, and as required to provide for the health and safety of all persons at the “work site.”
- .2 Direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, workers, and any other persons at the “work site” on safety related matters, to the extent required to fulfil “prime contractor” responsibilities pursuant to the Act, regardless of:
  - .1 Whether or not any contractual relationship exists between the Contractor and any of these entities; and
  - .2 Whether or not such entities have been specifically identified in this Contract.

**1.2 CERTIFICATE OF RECOGNITION (COR)**

- .1 Maintain a valid COR for the duration of the Work of this Contract.

**1.3 SAFETY REQUIREMENTS**

- .1 Establish and maintain a system or process to provide for the safety for all persons at the Site during the Contract Time, including:
  - .1 The development and implementation of satisfactory safety plans for all aspects of work and the co-ordination of all plans;
  - .2 The establishment of a safety committee; and
  - .3 Conducting safety meetings and workplace orientation meetings.
- .2 Communicate and co-operate on safety matters with the Owner and Occupational Health and Safety.
- .3 Comply with federal, provincial, and municipal legislation, including the Workplace Hazardous Materials Information System.
- .4 Rectify unsafe conditions, and be responsible for all related costs and delays.
- .5 Advise the Owner as soon as possible of all accidents.
- .6 Investigate any accident that causes injury, and complete accident forms and prepare accident reports.
- .7 Provide and maintain a first aid room and equipment as required by the Occupational Health and Safety Regulations.

- .8 Maintain first aid supplies, space, and trained personnel on Site as required by the Occupational Health and Safety Regulations.
- .9 Have at least one qualified first aider on Site for each work shift.

**1.4 SUBMITTALS**

- .1 Provide the following submittals.
- .2 The Certificate of Recognition (COR) prior to commencing Work at the Site.
- .3 The name of the person responsible for supervision of the Contractor's safety plan at the Site prior to commencing Work at the Site.
- .4 The names of workers qualified as first aiders prior to commencing Work at the Site including monthly updates.
- .5 At the end of each month, a list of accidents including lost time injuries incurred for the month, and a cumulative summary of all accidents and total lost time including a comparison with the total work time since the start of the Contract.
- .6 Completed accident forms and reports as soon as possible.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 QUALITY CONTROL**

- .1 Establish and maintain an effective quality control system including quality control procedures and testing to ensure compliance with the requirements of the Contract Documents.
- .2 Conduct tests incorporated in the quality control system and as required in the Specifications.
- .3 Engage qualified personnel, professional engineers, and independent CSA certified materials engineering and testing companies to carry out designs and to perform tests when required by the Specifications.

**1.2 QUALITY ASSURANCE**

- .1 The Owner will perform quality assurance testing and inspection as the Owner deems appropriate.
- .2 Co-operate with the Owner and provide assistance required by the Owner for testing, inspection, and sampling; provide access including off-Site locations; and provide equipment and labour to obtain samples.
- .3 If the quality assurance testing identifies quality deficiencies, the extent of removal and replacement of potentially deficient materials will be at the discretion of the Owner and will include, at least, all related materials placed after the Owner's previous quality assurance testing indicated acceptable quality.
- .4 If the quality assurance testing identifies ongoing quality deficiencies, submit to the Owner in writing, proposed revisions to the quality control procedures and testing that will prevent quality deficiencies. Continue the work only when the proposed quality control revisions have been reviewed with no exceptions taken by the Owner and implemented by the Contractor.

**1.3 TESTING BY CONTRACTOR**

- .1 Contractor shall furnish to Owner's Representative, upon request, test results from testing performed by Contractor.

**1.4 TESTING BY OWNER**

- .1 Owner reserves the right to employ services of independent testing agencies to establish if work complies with Contract Documents. Owner will appoint and pay for services of such testing agency.
- .2 Where tests or inspections, by Owner appointed testing agency, indicate work is not in accordance with the Contract Documents, additional tests or inspections, as Owner may require, to verify acceptability of corrected work, shall be paid for by Contractor.

**1.5 REFERENCE STANDARDS**

- .1 Within the text of these specifications, reference may be made to the following standards:
  - .1 ANSI - American National Standards Institute
  - .2 ASTM - American Society for Testing and Materials
  - .3 CGSB - Canadian General Standards Board
  - .4 CSA - Canadian Standards Association
  - .5 CAN 2 - National Standard of Canada (published by CGSB)
  - .6 FM - Factory Mutual Engineering Corporation
  - .7 ULC - Underwriters Laboratories of Canada
  - .8 CAN 3 - National Standard of Canada (published by CSA)
- .2 The testing of materials may be requested by the Owner, to prove conformance with Standards, and shall be paid for by the Contractor.
- .3 The referenced standard and any amendments in force on the day of receipt of tenders shall be applicable to the work during the duration of the Contract.

**2. PRODUCTS - NOT USED**

**3. EXECUTION - NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 EXISTING UTILITIES**

.1 Contractor's General Responsibilities:

- .1 The approximate existence of service lines known to the Owner are indicated in the Contract Documents. Confirm the number, type, location and elevation of all existing service lines. Contact the appropriate Utility to locate all lines, conduits, and other such structures. Notify the Owner if any service lines have been omitted from or are incorrectly specified in the Contract Documents.
- .2 Identify, stake, and flag all existing service line locations and elevations. Maintain staking and flagging.
- .3 Notify the appropriate Utility prior to carrying out operations in the vicinity of the service lines. Comply with the requirements of and co-operate fully with, each Utility for the location and protection of the service lines during the Work.
- .4 Be responsible to the Utility for any claims resulting from damage to the service lines as a result of the Contractor's construction operations.
- .5 Promptly notify the Utility and the Owner in the event of any damage or interruption to any services caused by the Contractor's construction operations. Co-operate with the Utility in the restoration of service as promptly as possible and bear all costs arising from the damage or interruption.
- .6 Excavation adjacent to power poles may require the poles to be supported. Contact the Owner of the power poles to determine if pole supporting is required for the construction methodology employed. Support power poles as necessary to complete the work.
- .7 At no time interfere with the operations of existing utilities.
- .8 Notify the utility owner at least 48 hours in advance of any interruption required for purposes of the work of an affected utility.
- .9 Co-ordinate the timing of the connections with the affected Owner of the specific utilities as required for the construction works.
- .10 Do not operate any existing water main valves and hydrants.
- .11 Only the utility owner's personnel shall operate the utility.
- .12 Meet Occupational Health and Safety (OH&S) regulations and requirements for all work associated with asbestos cement water materials.

.2 Utility Crossings:

- .1 The shallow Utility Owner(s) shall complete all relocation, modification, and repair work as highlighted in the drawings. The costs of shallow utility relocations, modifications, and repairs undertaken by the shallow Utility Owner(s) and shown

on the drawings shall be borne by the Owner. All other shallow utility relocations, modifications, and repairs shall be borne by the Contractor.

- .2 Co-ordinate all relocation, modification and repair work with the construction schedule and assist the utility Owner where needed. No separate payment will be made for this work.
- .3 Hydro Excavation:
  - .1 Hydro excavation shall be used to locate and expose existing utilities to be crossed by the underground utility works.
  - .2 The hydro excavation work includes locates; hydro excavation; measuring and recording of the hydro excavation information; securing and protecting the locate holes; and sand backfill.
  - .3 No separate payment will be made for relocating of existing utilities that were previously hydro excavated and measured for payment.
  - .4 No separate payment will be made for hydro excavating of shallow utilities related to roadwork unless approved by the Owner's Representative.
  - .5 Provide monthly written statements to the Owner's Representative for the hydro excavation hours for review and approval. Keep a running total of approved hydro excavation hours to date and shall provide that information to the Owner's Representative upon request.

**1.2 TEMPORARY UTILITIES**

- .1 Provide the specified temporary utilities and as otherwise required in order to execute the Work expeditiously. Remove the temporary utilities from the Site upon completion of the Work unless specified otherwise.
- .2 Co-ordinate and pay for all required temporary utility work.
- .3 Temporary Sanitation Facilities:
  - .1 Provide and maintain temporary sanitary facilities on site for work as required by legislation.
  - .2 Provide sanitation facilities for the Owner's Site office.
  - .3 Arrange and pay all costs for installation, maintenance, and removal.
  - .4 Re-establish sanitary services to affected residences, institutions and businesses as required to execute the work as quickly as possible.

**1.3 CROSSING AGREEMENTS**

- .1 Owner has made application for all required utility crossing agreements. Do not commence work on the utility crossings portion of the project until the Owner has obtained the agreements.

- .2 Meet the requirements of the applicable crossing agreements when undertaking all utility crossing work.
- .3 A copy of the crossing agreement will be provided to the Contractor once issued.
- .4 The Owner's representative and the Owner offer no interpretation of the crossing agreements. It is the responsibility of the Contractor to determine how to utilize the information provided to determine how the proposed work will be installed; and to provide all necessary equipment and labour for such installation. Any unforeseen delays or costs as a result of the crossings are the responsibility of the Contractor.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 REFERENCES**

- .1 Provide traffic accommodation in accordance with the latest edition and revisions of the Alberta Transportation – “Traffic Accommodation in Work Zones”, unless otherwise specified.
- .2 All traffic accommodation signage shall be in accordance with the latest edition of the “Manual of Uniform Traffic Control Devices for Canada” by the Traffic Association of Canada (TAC).
- .3 The Contractor is to consult with the Airport Operators in developing the site-specific traffic controls.

**1.2 EXISTING ROADS**

- .1 Protect the integrity of existing road structures including using suitably sized equipment and implementing construction procedures that will minimize damage to the structures.
- .2 Determine the condition and availability of public roads, clearances, restrictions, bridge load limits, bond requirements, conditions of use, and other limitations that may affect ingress to and egress from the site.
- .3 Complete a detailed video survey of all roadways and private property that may be used or impacted by the construction activities, prior to commencing any construction activities. The video survey will establish the condition of those areas prior to construction and will be the basis for any restoration work that may arise. Provide a copy of the video survey to the Owner’s Representative within 7 days of commencement of work.
- .4 Clean existing roads impacted by the construction activities, as directed by the Owner’s Representative and at no cost to the Owner.
- .5 Motor scrapers, rock trucks or tracked equipment are not permitted to travel on highways, bridges, irrigation works, paved roadways and lanes.
- .6 Do not block or impede access roads or driveways to local landowner residences located adjacent to the work sites.

**1.3 TEMPORARY ACCESS ROADS, HAUL ROADS AND DETOURS**

- .1 Design and construct all temporary roads, crossings across existing irrigation works, temporary bridges, and drainage structures required for construction operations.
- .2 Provide detours required for the execution of the Work.
- .3 Confine construction traffic to the limits of temporary roads and avoid disturbances to adjacent lands.
- .4 Contain hauled material in vehicles, and keep routes clear of mud, fallen rock, and debris resulting from construction operations.

- .5 Control dust, remove snow, and maintain road surfaces daily or at frequent intervals depending upon weather or traffic and as required by the Owner.
- .6 Reclaim all haul roads when they are no longer required. Scarify, grade to original contours, cultivate, replace topsoil, and seed to grass.

**1.4 TRAFFIC ACCOMMODATION STRATEGY**

- .1 Comply with all requirements of the road authority having jurisdiction over public roads used by the Contractor in the execution of the Work.
- .2 Determine the condition and availability of public highways and roads, clearances, restrictions, bridge load limits, bond requirements, and other limitations that may affect ingress to and egress from the Site.
- .3 Comply with applicable load regulations during hauling of materials and equipment over public highways, roads, or bridges. Minimize interference with local traffic.
- .4 Keep public highways and roads impacted by the Work open to traffic and passable at all times.
- .5 Retain qualified personnel or organizations specializing in such work to develop a Traffic Accommodation Strategy in accordance with Alberta Transportation - "Traffic Accommodation in Work Zones" documents and the requirements of other road authorities having jurisdiction.
- .6 The Traffic Accommodation Strategy work includes all equipment, material and labour required for the preparation, notification, implementation, modification, maintenance and removal component works necessary to complete the contract work.
- .7 The major components of the Traffic Accommodation works includes the following:
  - .1 Preparation:
    - .1 Utilize any traffic accommodation plans provided in the contract drawings as a basis to develop a plan for their work schedule. Assume ownership of any information from the provided traffic accommodation plan that is used to develop the traffic accommodation plan work.
    - .2 Prepare and provide the Owner's Representative a copy of their proposed traffic accommodation plan for review and comment a minimum of 14 days prior to implementation. Accommodating review comments is considered incidental.
    - .3 Undertake a detailed video survey of all highway, bridges, irrigation works, roadways, and lanes to be used or impacted by the Traffic Accommodation Strategy work. The video survey will establish the condition of those areas as the basis for any restoration work that may arise. Provide a copy of the video survey to the Owner's Representative within 7 days of commencement of traffic accommodation works.
  - .2 Notifications:
    - .1 At least 14 days prior to implementation of the traffic accommodation plan, provide written notification to the proper authorities including

- emergency services of proposed traffic accommodation works, detours, road closures and alternate traffic routes.
- .2 Seven days prior to implementation of the traffic accommodation plan, distribute written construction notifications to all affected residences, businesses, institutions and facilities informing them the nature of the work to be performed, how long the inconvenience will last, who to contact to register any complaint/claim. Submit the proposed notification to Owner's Representative for review and comment prior to distribution to the public.
- .3 Implementation:
- .1 Supply and install all detours, construction signage, traffic control and information signage required by their traffic accommodation plan and that is necessary to protect the work site and the safety of the workers and the public. The signage may include arrow boards, traffic signalization, barricades, delineators, glow posts, flashers, flashing lights, flagmen and associated items.
  - .2 Supply and install all protective measures required by their traffic accommodation plan necessary to protect the work site and the safety of the workers and the public. The protective measures may include barricades, protective barriers, fences, delineators, glow posts, flashers, flashing lights, flagmen and associated items.
  - .3 Provide qualified flagmen to control traffic at all locations where the Contractor's operations interfere with public highways, roads, and detours.
  - .4 The Owner will not provide any signage, protective measures or such items.
  - .5 Provide and maintain a barrier between his work site and the public, where possible.
  - .6 Safeguard all on-site equipment and materials.
- .4 Modification:
- .1 Supplement, modify and/or improve the traffic accommodation works on an ongoing basis to meet any vehicle and/or pedestrian traffic issues that may arise. This may include the addition or deletion of signage, protective measures and associated works. All modifications must be documented, submitted and reviewed by the Owner's Representative prior to implementation.
- .5 Maintenance:
- .1 When working onsite, check and maintain all traffic accommodation signage and protective measures work at least three times daily or as required. All maintenance items shall be remedied immediately upon notification.
  - .2 When not working onsite, check and maintain all traffic accommodation signage and protective measures work at least twice daily or as required. All maintenance items shall be remedied immediately upon notification.

- .3 Check, maintain and repair all traffic accommodation signage and protective measures for the duration of the work to ensure a safe protected route for both pedestrian and vehicular traffic at all times.
- .4 Promptly provide dust control and repair any damage to public highways, roads, and bridges resulting from traffic accommodation works in order to maintain public safety, access and use.

.6 Removal:

- .1 At the completion of the contract work, remove all traffic accommodation signage and protective measures. All covered/salvaged permanent signage removed during construction shall be uncovered/re-installed.
- .2 Upon achieving substantial performance of the Contract work, the Contractor, Owner’s Representative and Owner shall review all traffic accommodation works and detour routes to determine if any corrective works are required. Any corrective work will be included in the project deficiency list. All corrective work is considered incidental.

2.           **PRODUCTS**           –           **NOT USED**

3.           **EXECUTION**           –           **NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 REFERENCES**

- .1 Reference are made to standards as listed in the Specifications.
  - .1 Conform to these standards, in whole or in part, as required in the Specifications.
  - .2 Conform to the latest date of issue of the standards in effect on the date of the submission of bids, except where another date or issue is specified.

**1.2 SUBMITTALS**

- .1 When requested by the Owner, a complete description of the procedures for installing the product.
- .2 When requested by the Owner, appropriate design calculations for the products to be installed.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- .1 Inspect each shipment of products and timely replace any missing or damaged items.
- .2 Handle and store products in a manner to prevent damage, alteration, deterioration, and soiling, and in accordance with the manufacturer's written instructions when applicable.
- .3 Store packaged or bundled products in original and undamaged condition with the manufacturer's seal and label intact. Do not remove products from packaging or bundling until required in the Work.
- .4 Store products subject to damage from weather in weatherproof enclosures.

**2. PRODUCTS**

**2.1 PRODUCT QUALITY**

- .1 Provide products that conform to the Contract Documents, are new, not damaged or defective, and of the best quality (compatible with the Specifications) for the purpose intended. If requested by the Owner, furnish evidence as to the type, source, and quality of products provided.
- .2 Defective products, whenever identified prior to the completion of the Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility from the Contractor, but provides a precaution against oversight or error.
- .3 Unless otherwise indicated in the Contract Documents, maintain uniformity of manufacture for any particular or like items.
- .4 Do not place permanent labels, trademarks, or nameplates on products in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

**2.2 PRODUCT AVAILABILITY**

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

**3. EXECUTION**

**3.1 PRODUCT CONTROL**

- .1 Maintain an inventory of all products delivered to the Site and placed in temporary storage.
- .2 Record the use of products during the course of construction.
- .3 When requested by the Owner, provide inventory records for verification of quantities.

**3.2 TRANSPORTATION, STORAGE, HANDLING AND PROTECTION**

- .1 Pay costs of transportation of products required in the performance of Work.
- .2 Handle and store products in a manner to prevent damage, alteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .3 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and label intact. Do not remove from packaging or bundling until required in the Work.
- .4 Store products subject to damage from weather in weatherproof enclosures.
- .5 Store cementitious products clear of earth or concrete floors, and away from structures or undrained depressions.
- .6 Store and handle miscellaneous steel products and reinforcing steel by methods such that materials are not contaminated by mud, soil, dust or other debris.
- .7 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.
- .8 Stockpile sand, gravel or processed granular materials on a well drained prepared pad with low exposure to dust accumulation.
- .9 Store sheet materials and lumber in flat, solid supports and keep clear of ground. Slope to shed moisture.
- .10 Remove and replace damaged products at own expense and to the satisfaction of the Owner.

**3.3           INSTALLATION STANDARDS**

- .1       Unless otherwise specified in the Contract Documents, install products in accordance with the manufacturer's instructions. Do not rely on labels or enclosures provided with the products. Obtain written instructions directly from the manufacturers.
- .2       Notify the Owner, in writing, of conflicts between the Contract Documents and the manufacturer's instruction, so that the Owner may establish a course of action.

**3.4           REMEDIAL WORK**

- .1       Repair or replace the parts or portions of the Work identified by the Owner as defective or unacceptable.
- .2       Retain specialists familiar with the products affected to perform remedial work in a manner that neither damages nor endangers any portion of the Work.

**END OF SECTION**

**1. GENERAL**

**1.1 DEFINITIONS**

- .1 “Proprietary Specification” means a specification that lists one or more proprietary names of products or manufacturers and may also include descriptive language, references to standards, or lists performance requirements, or any combination thereof.
- .2 “Non–proprietary Specification” means a specification that uses descriptive language, references to standards, or lists performance requirements, or any combination thereof, but does **not** include proprietary names of products or manufacturers.
- .3 “Substitute Product” means a product not specified by proprietary name that may be acceptable in place of a product which is specified by proprietary name.
- .4 “Substitute Manufacturer” means a manufacturer not specified by proprietary name that may be acceptable in place of manufacturer which is specified by proprietary name.
- .5 “Substitution” means a Substitute Product or Substitute Manufacturer.

**1.2 PRODUCT OPTIONS**

- .1 For products specified by Non–proprietary Specification:
  - .1 Select any product by any manufacturer that meets the requirements of the Contract Documents.
- .2 For products specified by Proprietary Specification:
  - .1 Select any product or manufacturer named; or
  - .2 Select a substitute product or manufacturer in accordance with Article 1.3.
- .3 For products specified by Proprietary Specification and accompanied by words indicating that substitutions will not be accepted:
  - .1 Select any product or manufacturer named; Substitutions will not be permitted.

**1.3 SUBSTITUTIONS**

- .1 Where Substitute Products are permitted; unnamed products will be authorized by the Owner, subject to the following:
  - .1 Substitute Products shall be the same types as, be capable of performing the same functions as, and meet or exceed the standards of quality and performance of the named product(s). Substitute Products shall not require revisions to the Contract Documents nor to work of Other Contractors.
- .2 Do not order or install Substitutions without the Owner’s authorization.
- .3 If, in the Owner’s opinion, a Substitution does not meet the requirements of the Contract Documents, provide a product that, in the Owner’s opinion, does meet the requirements of the Contract Documents.

**1.4 CHANGES TO AUTHORIZED PRODUCTS AND MANUFACTURERS**

- .1 Do not change products or manufacturers, authorized by the Owner for use in performance of the Work, without the Owner’s written authorization.
- .2 Submit requests to change authorized products and manufacturers to the Owner in writing, including the product data indicated in Article 1.5.

**1.5 PRODUCT DATA**

- .1 When requested by the Owner, submit complete data substantiating compliance of a product with the requirements of the Contract Documents. Include the following:
  - .1 Product identification, including the manufacturer’s name and address.
  - .2 Manufacturer’s literature providing product description, applicable reference standards, and performance and test data.
  - .3 Samples, as applicable.
  - .4 Name and address of projects where the product has been used and the date of each installation.
  - .5 For Substitutions and requests for changes to authorized products, include, in addition to the above, the following:
    - .1 Itemized comparison of the substitution with the named product(s). List significant variations.
    - .2 Availability of maintenance services and sources of replacement products and parts.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 SURVEY REFERENCE POINTS**

- .1 Primary horizontal and vertical survey reference points have been established by the Owner as specified in the Contract Documents. The Owner is responsible for the accuracy of the primary survey reference points.
- .2 Locate, confirm, and protect primary reference points prior to starting Work on the Site. Preserve permanent reference points during construction.
- .3 Make no changes to or relocations of the primary survey reference points without prior written authorization of the Owner.
- .4 Report to the Owner when a reference point is lost or damaged, or requires relocation because of the Work.
- .5 Replace damaged reference points in accordance with the original survey control.

**1.2 CONTRACTOR SURVEY WORK**

- .1 Employ qualified construction surveyors to perform survey work.
- .2 Record survey data in accordance with standard survey methods in a form acceptable to the Owner.
- .3 Establish secondary survey reference points required for laying out and staking the Work and for checking tolerances. Be solely responsible for the accuracy of the secondary survey reference points and the layout, staking, and checking of the Work.
- .4 Establish lines, grades, and elevations, and locate and lay out the Work.
- .5 Provide final grade staking of each line, grade or elevation required for the Owner's checking of the work and for measurement for payment purposes, as defined in Section 01280 – Measurement Schedule, for checking by the Owner. Maintain final grade stakes in place until the Owner has authorized their removal.
- .6 Provide such assistance as may be required by the Owner for carrying out surveys in Article 1.5.
- .7 Establish and maintain survey reference points in all work areas, including elevations and locations relative to established stationing and offset systems or otherwise required by the Owner. Provide reference points within 50 m horizontal distance and 2 m vertical distance of all locations where testing, observations of conditions, or other similar activities are undertaken by the Owner, such that the Owner can establish the location and elevations at those locations.

**1.3 GLOBAL POSITIONING SYSTEMS (GPS)**

- .1 If GPS controlled excavation and trimming equipment is utilized in conjunction with GPS final grade checking, the Owner may waive the requirement for final grade stakes if the accuracy and consistency of the final grade check can be demonstrated.

- .2 If the final grade stake requirement is waived, provide a surface grade sheet in electronic and hard copy of the electronic survey data in a format acceptable to the Owner.
- .3 The surface grade sheet to include the following minimum information:
  - .1 Station.
  - .2 Offset left or right of the centerline.
  - .3 Design elevation at the grade line break point.
  - .4 Actual elevation at the grade line break point.
  - .5 Deviation of the actual elevation from the design elevation.
  - .6 Indication if deviation is within specified tolerances.

#### **1.4 ELECTRONIC DESIGN DATA**

- .1 Electronic design data is available from the Owner's Representative upon request. This information is intended as an aid for construction layout. The Owner's Representative does not guarantee its accuracy. Any discrepancies between the electronic design data and the drawings must be brought to the attention of the Owner's Representative immediately. Information provided on the drawings will take precedence over electronic design data.

#### **1.5 OWNER'S SURVEY REQUIREMENTS**

- .1 The Owner may carry out surveys, as the Owner deems necessary, to check the accuracy of the Contractor's layout and stakes.
- .2 The Owner will carry out surveys for the purpose of establishing limits for repairs.
- .3 The Owner will carry out surveys for the purpose of measuring the Work for payment.

#### **1.6 SUBMITTALS**

- .1 Provide the following submittals.
  - .2 The name and address of the Contractor's surveyor to the Owner prior to commencing the Work at the Site.
  - .3 When requested, submit a copy of reduced notes for surveys or portions of surveys to the Owner.
  - .4 A certificate signed by the Contractor's surveyor confirming that the lines, grades, elevations, and dimensions of the completed Work are in conformance or not in conformance with the Contract Documents. Provide details of all non-conformances.
  - .5 Electronic survey data files in a format acceptable to the Owner.

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2. PRODUCTS – NOT USED

3. EXECUTION – NOT USED

END OF SECTION

**1. GENERAL**

- .1 Perform final cleaning operations prior to the request for inspection for Total Performance.
- .2 Remove surplus products, tools, construction machinery, and equipment not required for the performance of the remaining Work prior to the request for inspection for Substantial Performance.
- .3 Remove waste products and debris resulting from the Work of the Contractor, and leave the Work clean and suitable for use by the Owner.
- .4 Repair, patch, and touch-up marred surfaces to match adjacent finishes.
- .5 Leave all surfaces in a neat, levelled condition.
- .6 Excavate and dispose of contaminated soils from equipment service and maintenance areas.
- .7 Excavate and dispose of excess soils including impervious, random, granular, and riprap materials.
- .8 Clean up and dispose of all foreign matter including wire, posts, logs, branches, roots, rocks, and construction debris.
- .9 Remove all temporary work.
- .10 Clean and sweep all new and existing roadways affected by contract work.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 SUMMARY OF PROCESS**

- .1 A Contract acceptance process will be used to facilitate the Owner's acceptance of the Work. The process can be summarized as follows:
  - .1 Substantial Performance of the Work:
    - .1 Fulfilment of prerequisites to Substantial Performance.
    - .2 Inspection for Substantial Performance.
    - .3 Issuance of a Certificate of Substantial Performance.
  - .2 Total Performance of the Work:
    - .1 Fulfilment of prerequisites to Total Performance.
    - .2 Inspection for Total Performance.
    - .3 Issuance of a Certificate of Total Performance.
  - .3 Warranty Performance of the Work:
    - .1 Fulfilment of prerequisites to Warranty Performance.
    - .2 Inspection for Warranty Performance.
    - .3 Issuance of Certificate of Warranty Performance.

**1.2 SUBSTANTIAL PERFORMANCE OF PART OF THE PERMANENT WORK**

- .1 When utilization of part of the Permanent Work is required and Substantial Performance of part of the Permanent Work is a condition of such utilization, the applicable requirements specified in this section will apply to the part of the Permanent Work to be utilized.

**1.3 PREREQUISITES TO SUBSTANTIAL PERFORMANCE**

- .1 Prior to requesting the Owner's inspection for Substantial Performance carry out the following:
  - .1 Perform Initial Commissioning.
  - .2 Obtain and submit evidence of compliance with Regulatory Requirements.
  - .3 Remove from the Site temporary facilities along with construction tools, equipment, mock-ups, and similar items not required for the performance of the remaining work.
  - .4 Correct all Contract Deficiencies that may affect operation of the structures.
  - .5 Complete the Work and have it ready for the purpose intended except for the parts of the Permanent Work specified in Articles 1.3.2 and 1.6.

- .6 Review the Contract Documents and inspect the Work to confirm that prerequisites to Substantial Performance have been fulfilled and that the Work is ready for inspection for Substantial Performance.
- .7 Submit product warranties and extended warranties when specified in the Contract Documents.
- .8 Make final change-over of locks and transmit keys to the Owner.
- .9 Complete installation of architectural finish items, including all mechanical and electrical covers and trims.
- .2 Complete all work items such that the Airport can be used for the purpose intended. Work that does not have to be completed to obtain Substantial Performance follows:
  - .1 Final clean-up.
  - .2 Operational and maintenance manuals.
  - .3 Record drawings.

**1.4 INSPECTION FOR SUBSTANTIAL PERFORMANCE**

- .1 Submit a written request to the Owner for inspection for Substantial Performance, certifying that prerequisites have been fulfilled and specifying known exceptions in the form of a list of items to be completed, corrected, or submitted.
- .2 The Owner will, within a reasonable time after receipt of the Contractor's request:
  - .1 Proceed with the inspection; or
  - .2 Advise the Contractor that prerequisites are not adequately fulfilled.
- .3 Results of the Owner's inspection for Substantial Performance will form the Substantial Performance Contract Deficiency List (SPC Deficiency List).

**1.5 SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Following inspection, the Owner will:
  - .1 Accept the Certificate of Substantial Performance of the Work stating the effective date of Substantial Performance, with a copy of the SPC Deficiency List attached; or
  - .2 Reject the Certificate of Substantial Performance and advise the Contractor that prerequisites to Substantial Performance are not fulfilled and repeat the inspection for Substantial Performance as necessary.

- .2 Upon acceptance of a Certificate of Substantial Performance of the Work, the Owner will assume responsibility for care, custody, and control of the Work, including responsibility for the following:
  - .1 Facility operation, including all systems and equipment.
  - .2 Maintenance.
  - .3 Security.
  - .4 Property insurance.
  - .5 Utility costs.

**1.6 PREREQUISITES TO TOTAL PERFORMANCE**

- .1 Prior to requesting the Owner's inspection for Total Performance, carry out the following:
  - .1 Perform the entire Work, including the correction of all Contract Deficiencies, including items listed in Article 1.3.2 and except those items arising from the warranty provisions of the Contract Documents.
  - .2 Review the Contract Documents and inspect the Work to confirm that prerequisites to Total Performance have been met and that the Work is ready for inspection for Total Performance.

**1.7 INSPECTION FOR TOTAL PERFORMANCE**

- .1 Submit a written request to the Owner for inspection for Total Performance, including a copy of the Owner's most recent SPC Deficiency List, and certify that each Contract Deficiency has been corrected or otherwise resolved in a manner agreed to between the Owner and the Contractor. List known exceptions, if any, in the request.
- .2 The Owner will, within a reasonable time after receipt of the Contractor's request:
  - .1 Proceed with the inspection; or
  - .2 Advise the Contractor that prerequisites are not adequately fulfilled.

**1.8 TOTAL PERFORMANCE OF THE WORK**

- .1 Following the inspection, the Owner will:
  - .1 Accept the Certificate of Total Performance of the Work, stating the effective date of Total Performance; or
  - .2 Reject the Certificate of Total Performance and advise the Contractor of Contract Deficiencies that must be corrected prior to issuance of a Certificate of Total Performance of the Work.

**1.9 PREREQUISITES TO WARRANTY PERFORMANCE**

- .1 The prerequisites to Warranty Performance are:
  - .1 Total Performance of the Work;
  - .2 Expiry of the warranty period; and
  - .3 Correction of items arising from the warranty period required by the Contract Documents.

**1.10 INSPECTION FOR WARRANTY PERFORMANCE**

- .1 Thirty to sixty days prior to the end of the warranty period, the Contractor shall apply to the Owner for acceptance of the Warranty Performance of the Work.
- .2 Just prior to the end of the warranty period, the Owner will conduct an inspection for Warranty Performance.

**1.11 WARRANTY PERFORMANCE OF THE WORK**

- .1 Following the inspection, the Owner will:
  - .1 Issue a Certificate of Warranty Performance of the Work; or
  - .2 Advise the Contractor of items that must be corrected prior to issuance of the Certificate of Warranty Performance of the Work.

**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 DESIGNATION OF CONTRACT RECORD DOCUMENTS**

- .1 At the commencement of the Work, the Owner will provide the following documents to be designated and retained as Contract Record Documents:
  - .1 One copy of the Specifications.
  - .2 Two complete sets of the Drawings.
  - .3 One set of all addenda issued.
- .2 Maintain one record copy of the following:
  - .1 Change Orders and other modifications to the Contract.
  - .2 Reviewed Shop Drawings, Product Data, and Samples.
  - .3 Field–test records.
  - .4 Inspection certificates.
  - .5 Manufacturers’ certificates.
  - .6 Final survey data.
  - .7 Environmental Construction Operations Plan

**1.2 MAINTENANCE OF CONTRACT RECORD DOCUMENTS**

- .1 Store Contract Record Documents in the Contractor’s Site office apart from documents used for construction. Provide files, racks, and secure storage.
- .2 Label each document “CONTRACT RECORD” in large, neatly printed letters.
- .3 Maintain Contract Record Documents in a clean, dry, and legible condition. Do not use these documents for construction purposes.
- .4 Keep Contract Record Documents available for inspection by the Owner. Revise the content of the documents as required prior to final submittal.
- .5 Maintain Contract Record Documents as work progresses. Record information for each area of work within 14 days after completion.

**1.3 RECORDING INFORMATION ON CONTRACT RECORD DOCUMENTS**

- .1 Record information on the Contract Record Documents provided by the Owner.
- .2 Use coloured erasable pencils to record information.
- .3 Use a different colour to record information pertaining to each major system.

- .4 Record changes and variations from the Drawings concurrently with construction progress. Do not cover any work until the required information is recorded.
- .5 Legibly mark Contract Record Drawings to record actual construction, including the following:
  - .1 Measured dimensions, depths, elevations, and horizontal co-ordinates of foundation excavations and fill surfaces, including the interfaces of fill zones.
  - .2 Measured dimensions, elevations, and horizontal co-ordinates of structure components and foundations.
  - .3 Measured depths, elevations, and horizontal co-ordinates of underground utilities and appurtenances. Reference locations to permanent surface improvements.
  - .4 Measured depths, elevations, and horizontal co-ordinates of internal utilities and appurtenances covered in construction. Reference to visible and accessible features of construction.
  - .5 Measured depths, elevations, and horizontal co-ordinates of instrumentation installed in foundations and structures.
  - .6 Field changes of dimensions and details.
  - .7 Changes to equipment layout and services.
  - .8 Details not on the original Drawings.
  - .9 References to related Shop Drawings and modifications.
- .6 Legibly mark the Specifications to record actual construction including the following:
  - .1 Manufacturer trade name and catalogue number of each product actually installed, particularly optional and substitute items.
  - .2 Changes made by addenda and Change Orders.
- .7 Maintain other documents including manufacturer's certifications, inspection certifications, field test records required by individual Specification sections.

**1.4 SUBMITTALS**

- .1 Provide the following submittals.
- .2 Prepare Contract Record Drawings at least monthly throughout the course of the Work as the information becomes available or the information is received. The Owner's representative will check the Contract Record Drawings and confirm the accuracy of the information by field notes, surveys, photographs, or other field observation methods and return the Contract Record Drawings to the Contractor after review for ongoing revisions.
- .3 Completed Contract Record Documents before or with the request for inspection for Total Performance. The owner reserves the right to withhold monies until record documents are provided.

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2. PRODUCTS – NOT USED

3. EXECUTION – NOT USED

END OF SECTION

**1. GENERAL**

**1.1 DESCRIPTION OF TYPES OF OPERATION AND MAINTENANCE DATA**

- .1 The following documents are designated as Operation and Maintenance Data.
- .2 For systems designed by the Contractor, Contractor Designed System Data includes the following:
  - .1 System Design and Performance Criteria.
  - .2 System and Controls Descriptions.
  - .3 System and Controls Schematics.
  - .4 Operating Instructions.
  - .5 Equipment Data.
  - .6 Other data as required by the Owner.
- .3 Installation Instructions includes the manufacturer's printed instructions describing the recommended installation procedures, and photographs, video footage, and computer software.
- .4 Operating Instructions includes the manufacturer's printed instructions describing proper operation, and photographs, video footage, and computer software.
- .5 Equipment Identification includes the nameplate information for each piece of equipment, in a form, and with content acceptable to the Owner.
- .6 Maintenance Instructions includes the manufacturer's printed instructions describing the manufacturer's recommended maintenance and photographs, video footage, and computer software.
- .7 Spare Parts Lists includes parts lists and the manufacturer's recommended maintenance products and spare parts.
- .8 Suppliers and Contractors List includes a list of Contractor, Subcontractors, and Suppliers who supplied and installed equipment, systems, materials, or finishes, organized by the Division of Specifications and system, and company names, addresses, and telephone numbers.
- .9 Tag Directory includes a directory identifying tag number and equipment description and location.
- .10 Drawings List includes a list of Drawings.
- .11 Shop Drawings includes the final reviewed Shop Drawings.
- .12 Product Data includes the manufacturer's product data for equipment, systems, materials, and finishes, and photographs, video footage, and computer software.
- .13 Material Safety Data Sheets (MSDS) includes the MSDS for all relevant products.

- .14 Certifications includes the following:
  - .1 Copies of inspection reports prepared by authorities having jurisdiction.
  - .2 Certified copies of test reports prepared by independent testing agencies.
  - .3 Any other certificates required by the Contract Documents.
- .15 Warranties and Bonds include the Owner's copy of manufacturer's warranties, maintenance bonds, and service contracts.
- .16 Reports includes the following:
  - .1 Documentation certifying the performance of tests required by the Contract Documents and the results of those tests.
  - .2 Documentation of other material, equipment, or system related information required by the Contract Documents.

**1.2 OPERATION AND MAINTENANCE MANUAL BY THE CONTRACTOR**

- .1 Prepare the operation and maintenance manual as follows:
- .2 General organization of each volume:
  - .1 Include the following in each volume:
    - .1 Title page.
    - .2 Table of contents. Identify volume number where listed information is located.
    - .3 Ten percent free space for additional data.
  - .2 Present textual information, schematics and data on 21.5 × 28 cm, 75 g/m<sup>2</sup>, white bond paper.
- .3 Manual contents organization:
  - .1 For each major equipment, system, materials or finishes area, organize operation and maintenance data as follows:
    - .1 Operation Division: include the following, as applicable:
      - .1 System Design Criteria.
      - .2 System and Controls Descriptions.
      - .3 System and Controls Schematics.
      - .4 Operating Instructions.
    - .2 Maintenance Division: include the following, as applicable:
      - .1 Maintenance Tasks and Schedules.
      - .2 Spare Parts.
      - .3 Suppliers and Contractors.
      - .4 Tags and Directories.

- .3 Contract Document Division: include the following, as applicable:
  - .1 Drawings List.
  - .2 Shop Drawings and Product Data.
  - .3 Certifications.
  - .4 Warranties and Bonds.
  - .5 Maintenance Brochures.
  - .6 Reports.
- .4 Document Binding Methods
  - .1 Standard 21.5 × 28 cm sheets: punch sheets to fit binder.
  - .2 Sheets up to 28 × 41.5 cm: punched and neatly folded to allow use without removing from binder.
  - .3 Drawings larger than 28 × 41.5 cm: insert drawings in sturdy vinyl envelopes with reinforced binding holes, open on one side and overall folded size not exceeding 21.5 × 28 cm. Do not punch holes in drawings.
- .5 Binders
  - .1 Commercial quality, fabric coated, hard covers attached to spine with metal piano hinges, three post, designed to accommodate 21.5 × 28 cm paper. Maximum 100 mm thick.
  - .2 Silk-screen project title and identification, in gold, on front cover and spine of binder. All binders to be forest green with gold lettering.
  - .3 Covers to read as follows:

Operation and Maintenance  
Manual

Town of Drumheller

Drumheller Airport Lighting

{Month, Year}

Prime Consultant: MPE Engineering Ltd.

General Contractor:

Mechanical Contractor:

Electrical Contractor:

The Spine to read as follows:

Operation and Maintenance  
Manual

Town of Drumheller

Drumheller Airport Lighting

{Month, Year}

- .4 Divider tabs:
  - .1 Heavy-weight coloured paper, mylar laminated with tab number and title printed on tab as follows.
  - .2 Main divisions: white tabs, labelled with division name, 2 bank tab length.
  - .3 Sections of a main division: colour coded tabs, labelled with section name, 4 bank tab length.
  - .4 Subsections: same colour tabs as the section, printed label, 8 bank tab length.
  - .5 Co-ordinate tab colour codes and labelling format with the Owner.

### 1.3 SUBMITTALS

- .1 Provide the following submittals:
  - .1 One draft copy of the operation and maintenance manual prior to requesting inspection for Substantial Performance.
  - .2 Three copies and one digital copy of the completed operation and maintenance manual prior to requesting inspection for Total Performance.
- .2 The Owner reserves the right to withhold any amount of payment up to a maximum of \$20,000 until the Contractor provides satisfactory copies of the O&M manuals.

2. **PRODUCTS** – **NOT USED**

3. **EXECUTION** – **NOT USED**

**END OF SECTION**

**1. GENERAL**

**1.1 SOURCE OF SUPPLY**

- .1 Provide spare parts manufactured by original equipment manufacturer.
- .2 Provide maintenance materials identical to those installed.

**1.2 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver required items to the Place of the Work and store in temporary locations determined by Contractor or permanent locations designated by Owner.
- .2 Deliver and store items in original factory packaging or other securely packaged form.
- .3 Identify, on carton or package, name of item, colour or part number, as applicable. Identify equipment, system, area, room no., etc. for which each item is intended.
- .4 Maintain an inventory list of all items delivered. For each item, record description of item, quantity, and location where stored.
- .5 Stored items shall remain in Contractor's care, custody, and control until the completion of the Work. Protect stored items against theft or damage.
- .6 Handle items as necessary, until stored in permanent locations designated by Owner's Representative.

**1.3 ACCEPTANCE**

- .1 Prior to requesting Owner's final inspection, do the following:
  - .1 Review Contract Documents and compare with inventory list to verify that all required items have been delivered.
  - .2 Verify that items listed on inventory list are in there designated storage locations.
  - .3 Inspect items to verify that they meet specified requirements and are in serviceable condition.
  - .4 Arrange for delivery of any missing items.
  - .5 Arrange for replacement of items not meeting specified requirements or not in serviceable condition.
  - .6 Provide Owner with copy of inventory list indicating status of all required items.
- .2 Review inventory list with Owner's Representative during final inspection.

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**2. PRODUCTS – NOT USED**

**3. EXECUTION – NOT USED**

**END OF SECTION**

**1. SCHEDULE**

- .1 Present detailed Schedule of start-up, commissioning and continuous operating phases for review by Owner's Representative and Owner at least 4 weeks prior to this phase of work. Do not commence start-up and commissioning until schedule has been reviewed by the Owner's Representative.

**2. NOTICE**

- .1 Notwithstanding Clause 1.1 above, give Owner's Representative and Owner at least 48 hours prior notice before Start-up or Commissioning is due to commence. Supply at this time all documentation relating to testing of equipment, supplier's certification of satisfactory installation and Contractor's certification that all systems can be started up.

**3. SEQUENCE OF EVENTS**

- .1 Testing, Start-up and Commissioning
  - .1 Test, start-up and commission the works in an orderly fashion by "system", where "system" is defined as an integral operating entity or loop. On completion of construction of a system, test and otherwise check the system and be satisfied that it is ready for a pre start-up inspection by Owner's Representative, prior to start-up of system.
  - .2 All systems shall be satisfactorily started up by the Contractor and for all major systems. All Start-up Completion Certificates describing system equipment, start-up results, test deficiencies, start-up deficiencies and rectification procedures shall be submitted to the Owner's Representative for review prior to commencement of commissioning of the works.
  - .3 The following constraints in testing, start-up and commissioning will be taken into account:
    - .1 Cleaning, leakage testing and disinfection of all systems is required prior to start-up.
    - .2 Test individual compartments within a system individually prior to testing entire system.
    - .3 A complete "dry-run" test of every system is required to demonstrate satisfactory installation, prior to "wet-run" testing, start-up and commissioning. e.g., each pump control system shall be fully checked and tested with pump motor locked out, prior to pump start-up.

**4. DEFINITIONS AND PROCEDURES**

- .1 Testing:
  - .1 Related testing includes hydrostatic and pressure testing, disinfection, and all other pre start-up tests on equipment as described in the Contract Document.

- .2 Start-up:
  - .1 Notify the Owner's Representative in writing 48 hours prior to system start-up. Owner's Representative's approval of all supporting documentation is required prior to start-up.
  - .2 Start-up shall consist of placing individual systems into operation, re-confirming all equipment test results, performing any tests not yet carried out which may be deemed necessary by Owner's Representative to demonstrate satisfactory performance of equipment, calibration or balancing of equipment, and confirming operation of control systems and protective devices. All suppliers' representatives for equipment in the systems, and qualified electrical, control and instrument personnel shall be on site for full duration of start-up of a system.
- .3 Commissioning:
  - .1 Commence commissioning following successful start-up of all individual systems.
  - .2 Commissioning shall consist of placing all various systems of the works into simultaneous continuous operation, in an orderly manner. All suppliers' representatives and qualified electrical, control and instrumentation personnel shall be on site for the initial period of commissioning or as required until all systems are up and successfully running, simultaneously. Commissioning is deemed complete when all systems have been operating continuously without fault and all process, mechanical and electrical equipment is free of vibration, overloading or overheating, and is functioning in accordance with specified rates, methods and performance.
  - .3 The period for continuous operation for completion of commissioning shall be 80 hours, during which time the system shall operate without fault or failure as described above. Provide competent staff to oversee the operation and shall arrange for manufacturer's service personnel and subcontractors' personnel, if so required, to attend to any problems that arise. Failure of any part of the works during this period will require restart of the 80 hour period following rectification of the fault or failure.
- .4 Operator Training:
  - .1 Special training of Town staff to take place following successful start-up of all systems, during commissioning period. Co-ordinate visits of equipment suppliers' supervisors and schedule mutually agreeable times for special training periods.

**5. RESPONSIBILITY**

- .1 Be responsible for testing, start-up commissioning and continuous operation.
- .2 Coordinate equipment suppliers' representatives and all sub-trades personnel for start-up and commissioning.
- .3 Arrange for the services of the equipment manufacturer's technical representative, when equipment installation has been completed.

- .4 Equipment manufacturer's technical representative to inspect installation to ensure that equipment has been installed in accordance with manufacturer's requirements. Make adjustments in accordance with instructions of equipment manufacturer's technical representative.
- .5 Advise Owner's Representative in writing that installation has been checked, installed correctly and is in working order following satisfactory start-up.
- .6 Cost of equipment manufacturer's representative shall be borne by Contractor. Do not designate a subtrade as a representative during construction, testing, start-up, commissioning and continuous operation.
- .7 Owner's Representative will request that equipment be operated to demonstrate that it will perform as specified. Owner's Representative will note deficiencies. Correct deficiencies immediately. Advise Owner's Representative in writing when deficiencies have been corrected.
- .8 If deficiencies are of a sufficiently serious nature that manufacturers' representatives are required to make additional visits, additional costs shall be borne by Contractor.
- .9 If it is necessary to suspend start-up, or commissioning, or continuous operation due to deficiencies in any system, the full cost of interruption, call back and resumption of start-up, or commissioning, or continuous operation shall be paid by Contractor.
- .10 Commission and operate the works during continuous operating period. Operation personnel may observe and assist during commissioning and continuous operating period.

**6. SYSTEMS DEMONSTRATION**

- .1 Special training of operators shall take place following successful start-up of all systems, during the commissioning period. Co-ordinate visits of equipment suppliers' supervisors with Operations Staff and schedule mutually agreeable times for special training periods.
- .2 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times.
- .3 Owner will provide list of personnel to receive instructions, and will coordinate their attendance at agreed upon times.
- .4 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .5 Review contents of manual in detail to explain all aspects of operation and maintenance.
- .6 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent.
- .7 The individual providing training must be a manufacturer's certified technician with competent instructional skills and fully familiar with the detailed operation and maintenance of the provided equipment. The Owner will be the sole judge of the competence of the instructor and quality of instruction. The Owner reserves the right to

withhold any amount of payment up to a maximum of \$15,000 until the Contractor provides training to the satisfaction of the Owner.

- .8 Training to cover the following items:
  - .1 Overview of equipment;
  - .2 Review of Operations and Maintenance Manual documentation for the equipment;
  - .3 Instruction and demonstration of operation. Includes start-up, shut down, all possible equipment faults and possible rectification;
  - .4 Instruction and demonstration of maintenance to include daily, weekly, monthly, quarterly and annual preventative maintenance checks/actions as recommended by the manufacturer as well as trouble shooting summarized clearly on trouble shooting sheets for the specific model of each major piece of equipment.
- .9 All instructional training, supplemented by training and manual handouts, must be in sufficient detail to cover all Owner responsible operations and maintenance requirements to maintain manufacturers' warranties in tack. Training and documentation must highlight specific requirements that if completed or not completed may or would, void or jeopardize the equipment warranty.

**7. DOCUMENTATION**

- .1 Provide documentation for start-up, commissioning and continuous operation of the works. Provide a detailed written description of proposed procedure for start-up of each system, including methods of calibration, flow routes, tests, and personnel involved. Submit proposed procedure with detailed commissioning and operating schedule specified in clause 1.2 above to Owner and Owner's Representative at least 4 weeks prior to start-up of system.
- .2 Prepare a written procedure for commissioning and continuous operation of the works for review by Owner and Owner's Representative prior to commencing commissioning and continuous operation.

**8. START-UP**

- .1 Undertake start-up of systems of the work in an orderly manner. Coordinate start-up so that adequate staff are available and that conflicts do not occur due to multiple start-ups at the same time.

**9. COMMISSIONING**

- .1 Commission the works in accordance with written procedure for commissioning. Provide sufficient manpower for duration of commissioning period. Make necessary adjustments during commissioning to enable the works to be put into continuous operation.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for the location, use and placement of “Demolition, Removal and Salvage” requirements specified herein.

**1.2 DEFINITIONS**

- .1 For the purpose of construction in this Contract, the following definitions apply:
  - .1 “Salvageable” is defined as all materials having salvage value.
  - .2 “Non-salvageable” is defined as all material having no salvage value.

**2. PRODUCTS**

- .1 Not Applicable.

**3. EXECUTION**

**3.1 INSPECTION**

- .1 Inspect site and verify with the Owner’s Representative items to be demolished, removed, and salvaged.

**3.2 SALVAGEABLE MATERIALS**

- .1 All materials having a salvage value will be excavated and removed in such a manner that no damage will be done to the material. Salvaged material will be removed, cleaned and stored at a location within the work area. At the completion of the project all salvage items will be transferred to the Owner’s facility for storage. There will be no separate payment for salvaging or transferring to storage of these items.

**3.3 DEMOLITION AND NON-SALVAGEABLE MATERIALS**

- .1 Unless indicated otherwise, demolition and non-salvageable materials will be excavated, transported and disposed of at a licensed landfill. Burying of demolition and non-salvageable materials will not be allowed under any circumstances.
- .2 Asbestos cement pipe and materials are to be handled, removed and disposed of according to OH&S regulations and guidelines and the “*Alberta Asbestos Abatement Manual*”, latest edition by Alberta Employment and Immigration.
- .3 The Contractor will bear the cost of all disposal fees.

**3.4            REMOVAL OF ASPHALT MATERIALS**

- .1        Saw cut or wheel cut the asphalt as required for all asphalt removal work and as indicated by the Owner's Representative. All cutting to be approved by Owner's Representative prior to cutting.
  
- .2        Re-cut asphalt edges that are damaged or rounded due to the work, at no expense to the Owner.
  
- .3        Asphalt removals other than by cold milled method will be excavated, loaded, hauled and disposed of at a licensed landfill, unless otherwise authorized by the Owner's Representative.
  
- .4        No separate payment will be made for saw cutting or wheel cutting asphalt, unless otherwise noted.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this section in conjunction with other sections for the location, use and placement for “Care of Water” specified herein.

**1.2 SITE CONDITIONS**

- .1 Be aware that the project area is located where rapid temperature, and weather changes occur in all four seasons. Prepare the site for sudden rainfalls and quick snow melts due to Chinook winds.

**2. PRODUCTS**

**2.1 EQUIPMENT AND MATERIALS**

- .1 Provide all pumps, hoses and related equipment and power sources required for “Care of Water”.
- .2 Maintain pumps in good operating condition at all times. Have at least one standby pump for each category of pump required for care of water onsite at all times.
- .3 Install a replacement pump or pumps of equal capacity before removing a pump or pumps for maintenance.

**3. EXECUTION**

**3.1 GENERAL**

- .1 Design, construct and maintain Temporary Works, construct and maintain related Permanent Works, as required for care of water, including all necessary cofferdams, channels, flumes, drains, sandpoints, wells and sumps and other temporary diversion and protective works and furnish all materials required therefore. Furnish, install, maintain and operate all necessary pumping and other equipment, for dewatering the various parts of the work and for maintaining the foundation and other parts of the work free of water, ice and snow from whatever source.
- .2 Maintain all sumps, trenches and discharge lines to ensure proper containment and free flow of water to and from the pumps and other diversion and protective works at all times.
- .3 Obtain permits, in addition to those obtained by the Owner.
- .4 Ensure that “Care of Water” procedures do not interfere with the excavated work areas, operation of road surface drainage courses, natural watercourses, utilities or the flow of traffic.

- .5 Repair damage to any part of the work caused by water or failure of protective works at no extra cost to the Owner.
- .6 Be responsible for additional excavation and subsequent backfill made necessary by water, snow, or ice.
- .7 Ensure procedures for "Care of Water" do not cause pollution in the area. Locate and control discharges of water to avoid causing damage to property, pollution of watercourses, nuisances on roads, or injury to the public or wildlife.
- .8 Remove or level all cofferdams, drainage ditches or other Temporary Works after having served their purpose so as not to interfere in any way with adjacent facilities or with adjacent landowners.
- .9 Make provisions for handling residual water, storm runoff and snowmelt that may enter the work area or excavations from time to time.
- .10 Make arrangements with the Owner, landowners and agencies, which may be affected by disposal of water, snow and ice. Written permission is required before any water may be disposed of through sewer of a municipality.
- .11 Remove and dispose of all water, snow and ice from the work areas in a manner not detrimental to public or private property, or any portion of the work completed or under construction.
- .12 Excavations are to be kept free of water while work is in progress.
- .13 Protect open excavations against flooding and damage due to surface runoff.
- .14 Provide the Owner's Representative written details of the proposed dewatering and/or heave prevention measures and methods such as dikes, well points, and sheet pile cut-offs.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Stripping” specified herein.

**1.2 DEFINITIONS**

- .1 For the purpose of construction in this Contract, the following definitions apply:
- .1 “Topsoil” is defined as the uppermost part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils, normally ranging in depth from 50 mm to 450 mm, capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
  - .2 “Subsoil” is defined as material that lies immediately beneath the Topsoil and extending to root depth. Subsoil may be up to 1.5 m in depth.
  - .3 “Overburden” is defined as soil material that lies between the Subsoil and the material that is designated to be utilized for construction.
  - .4 “Stripping” is defined as the excavation of Topsoil, Subsoil, and Overburden, including materials in frozen condition.

**2. PRODUCTS**

- .1 Not applicable.

**3. EXECUTION**

**3.1 PROTECTION OF EXISTING FACILITIES**

- .1 Locate utility lines, fencing, survey reference points, instrumentation, culverts, and all other existing facilities before commencement of Work. Protect these items from damage.

**3.2 EXCAVATION**

- .1 Do not strip any area without prior approval of the Owner.
- .2 Stay on designated haul roads and do not disturb grassed or natural areas not part of the Work. Do not drive on undisturbed areas except for the performance of stripping operation.
- .3 In stripping areas, strip topsoil to top of subsoil levels, then strip the subsoil to top of overburden levels, then strip the overburden. Avoid mixing Topsoil, Subsoil and Overburden.

- .4 Strip and stockpile materials separately to prevent contamination.
- .5 Strip and stockpile materials from temporary construction access roads, borrow areas and waste fill areas required for performance of the Work.
- .6 Conduct the stripping operation far enough in advance of excavation to ensure that undesirable material does not become mixed with the Topsoil.
- .7 Suspend stripping operations during rain or wet ground conditions.
- .8 Suspend stripping operations during high winds greater than 80 km/hr, which may result in contamination or loss of Topsoil.
- .9 Provide proper drainage of surface water from stripped area to prevent ponding and infiltration in areas where fill is to be placed.
- .10 Use equipment with precise depth control such as a grader when stripping shallow depth topsoil.
- .11 If the stripping area soils are frozen, rip the area to a depth of 300 mm and stockpile separately.
- .12 Excavate all initial frozen material. Subsequent frost removal will not be paid.

### **3.3 STOCKPILES**

- .1 Unless otherwise designated in the Contract Documents, stockpile stripped material adjacent to borrow areas. Choose stockpile locations such that they will not interfere with construction.
- .2 Stockpile topsoil separately from other materials.
- .3 Maintain a minimum separation of 1 m between stockpiles.
- .4 Stockpile frozen stripped material separately from other materials.
- .5 Adopt measures to prevent drifting of topsoil.
- .6 Keep drainage courses clear of stockpiled material.
- .7 Stockpile material at slopes lower than 2H:1V.

### **3.4 DISPOSAL OF STRIPPING MATERIAL**

- .1 The Contractor will assume ownership of the different waste stripping materials, not incorporated in the work. The Contractor is encouraged to recycle the waste material where practical. Dispose of non-recycled topsoil material at a licensed landfill, unless otherwise approved by Owner's Representative.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Topsoil Placement” specified herein.

**1.2 TOPSOIL TESTING**

- .1 Contractor will arrange and pay for services of accredited testing laboratory, approved by the Owner’s Representative, to perform complete soil quality analysis on topsoil. Provide adequate tests from all sources of topsoil and submit original copy of analysis to the Owner’s Representative.
- .2 Soil analysis will include results for: existing soil nutrients; soil salinity expressed as electrical conductivity; pH value; organic matter; soil texture; fertility recommendations; and recommended soil conditioning amendments.

**1.3 SOURCE TOPSOIL**

- .1 Use native topsoil materials from designated topsoil stockpiles provided it meets specified requirements.
- .2 If native topsoil is inadequate in quantity, quality or both, use imported topsoil meeting specified requirements for balance of topsoil required.

**2. PRODUCTS**

**2.1 TOPSOIL MATERIALS**

- .1 Topsoil materials to be a mixture of mineral particulates, microorganisms and organic matter which provides suitable medium for supporting intended plant growth.
  - .1 Soil texture to be based on the *Canadian System of Soil Classification*, to consist of 20% to 70% sand and contain 2% to 10% organic matter by weight.
  - .2 Topsoil PH value to be between 6.5 to 8.0.
  - .3 Topsoil to contain no toxic elements or growth inhibiting materials.
  - .4 Topsoil to be free from debris and stones over 50 mm diameter.
  - .5 Topsoil consistency to be friable when moist.
- .2 Major soil nutrients required for topsoil fertility to be present in following ratios:
  - .1 Nitrogen (N): 20 to 40 microgram of available N per gram of topsoil.

- .2 Phosphorus (P): 10 to 20 micrograms of phosphate per gram of topsoil.
- .3 Potassium (K): 80 to 120 micrograms of potash per gram of topsoil.
- .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
- .5 Coarse vegetative material: 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

**3. EXECUTION**

**3.1 DESIGNATED TOPSOIL MATERIALS**

- .1 Control and eliminate perennial grass and noxious weeds including their root systems until stockpile topsoil is required for landscape use. Stockpile topsoil will be reasonably free of all weed growth before placement on site.
- .2 Perform weed control, when necessary, in accordance with relevant government chemical pesticide application legislation. Obtain Owner's approval for all pesticide applications.
- .3 Submit detailed pesticide applicator's log for verification after each application of approved pesticide.
- .4 Disc topsoil material and remove all rocks to the extent that the rock content is comparable to adjacent undisturbed areas. Remove all debris, sod lumps and stones over 50 mm diameter. Dispose of waste materials at a licensed landfill.

**3.3 PREPARATION OF SUBGRADE**

- .1 Remove debris, roots, branches, foreign material, undesirable plants, visible stones in excess of 50 mm diameter, contaminated soil and other deleterious materials. Dispose of waste materials at a licensed landfill.
- .2 Grade areas to be reclaimed to finish subgrade. Eliminate uneven areas and low spots and ensure proper drainage.
- .3 Scarify all areas designated for topsoil placement to a depth of 150 mm, except in areas where considered impractical by the Owner's Representative. Scarify entire subgrade area once in the longitudinal direction and once in the perpendicular direction. Disc area when large clay lumps are prevalent.
- .4 Compact finished subgrade to 95% of Standard Proctor Density.

**3.4 TOPSOIL PLACEMENT**

- .1 Place and spread subsoil and topsoil materials in uniform layers not exceeding 150 mm, in dry weather on dry unfrozen subgrade.

- .2 Manually spread and rake topsoil around structures, trees, fences or other obstructions.
- .3 Spread topsoil to obtain minimum depth after settlement of:
  - 150 mm for seeded areas

### **3.5 FINISH GRADING**

- .1 Remove all stones in excess of 50 mm diameter, soil lumps, roots, grass, weeds, construction materials, debris and foreign non-organic materials that may surface after preparation. Dispose of waste materials at a licensed landfill.
- .2 Thoroughly cultivate topsoil to minimum depth of 100 mm by rototilling or hand methods where compaction has occurred and to break all soil lumps.
- .3 Float until surface is smooth. Cut smooth falls to catch basin rims, finish flush.
- .4 Fine grade to eliminate rough or low areas and to ensure positive drainage on slopes and away from buildings, sidewalks and other structures. Maintain levels, profiles and contours of subgrade.
- .5 Leave surface smooth, uniform and sufficiently firm to prevent settlement or sinkage pockets when watered. Finished surface to be even and free from irregular surface changes.
- .6 Rake, chain drag and lightly roll topsoil areas, remove all ridges and fill all depressions. On larger areas, use hydraulic power box rake or similar mechanical equipment to: remove soil lumps, rocks and debris; fill and level low areas; and correct other grading deficiencies in preparation of seed or sod bed.
- .7 When topsoil will abut existing turf, cut turf to form a straight joint with the new seeded or sodded areas.
- .8 Where topsoil will be receiving sod, leave final grade 15 mm below finish grade of adjacent pavement, edging, curbs and crown of adjacent turf area.
- .9 Do not cover catch basins, manholes, valve covers, irrigation boxes or any other surface accesses.
- .10 Use water trucks and sprinklers to control all airborne dust caused by topsoil placement and grading operations when necessary.
- .11 Immediately clean up any soil or debris spilled onto roadway, walks and mulched areas.

### **3.6 TOLERANCES**

- .1 The finished topsoil surface to be even, uniformly shaped and compacted to within  $\pm 15$  mm of design grade, but not uniformly high or low, while maintaining surface drainage.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this section in conjunction with other sections for location, use and placement of “Excavation” specified herein.

**1.2 DEFINITIONS**

- .1 “Common Excavation” is defined as all excavation, hauling, placement and compaction of materials within the project work area excluding materials classified under topsoil stripping, rock excavation, borrow excavation or other specified excavation operations as shown in the Contract Documents or as designated by the Owner’s Representative.
- .2 “Borrow Excavation” is defined as all imported excavation from borrow areas excluding materials classified under topsoil stripping, excavation of frozen material or other specified excavation operations as shown in the Contract Documents or as designated by the Owner’s Representative.
- .3 “Waste Excavation” is defined as all excavation, hauling, and placement of materials, within the project work area and at designated waste areas, that are not suitable for use or are surplus to requirements for the completion of the project work excluding materials classified under topsoil stripping, rock excavation or other specified excavation operations as shown in the Contract Documents or as designated by the Owner’s Representative.

**2. PRODUCTS**

- .1 Not applicable.

**3. EXECUTION**

**3.1 PREPARATION**

- .1 Notify Owner’s Representative at least 2 days prior to beginning excavating operations.
- .2 Prior to commencing excavation:
  - .1 Contact all appropriate utility companies and establish exact location and current status of all utilities, voltage of underground and overhead power lines and pressure of natural gas lines.
  - .2 Notify Owner if any utility lines have been omitted from or incorrectly indicated in the Contract Documents.

**3.2 PROTECTION OF EXISTING FACILITIES**

- .1 Locate utility lines, fencing, survey reference points, instrumentation, culverts, and all other existing facilities before commencement of Work. Protect these items from damage.

**3.3 UNAUTHORIZED EXCAVATION**

- .1 Unauthorized excavation is any excavation beyond lines, elevations and dimensions indicated in the Contract Documents without specific authorization by the Owner.
- .2 Fill unauthorized excavation to lines, elevations and dimensions indicated, as directed by the Owner's Representative.
- .3 Unauthorized excavation and remedial work will be at Contractor's expense.

**3.4 EXCAVATION LINES**

- .1 Excavate to the lines, grades and elevations indicated in the Contract Documents or as determined by the Owner's Representative
- .2 The Owner's Representative will determine if unsuitable bearing materials are encountered at indicated foundation elevations. Carry excavation deeper to remove unsuitable bearing materials and replace excavated material with suitable materials.
- .3 The Owner's Representative will determine if bearing conditions are fulfilled at elevations above those indicated in the Contract Documents. Adjust excavation elevations to accommodate raised foundation level.

**3.5 SHORING AND BRACING**

- .1 If required to provide safe working conditions and to prevent cave-ins and loose soil from falling into excavations, protect excavations by temporary shoring, bracing, or other suitable methods.
- .2 Where the excavation is made to accommodate structures, remove sufficient material to allow for the proper placing and bracing of forms.
- .3 No extra payment will be made for supplying, placing, maintaining and removing sheeting, bracing, shoring, or other means of temporary support.

**3.6 EXCAVATION**

- .1 Strip Topsoil and Subsoil and Overburden in accordance with Section 02200 and stockpile in the designated areas.
- .2 Remove and dispose of all water, snow and surface ice prior to excavation.

- .3 Schedule and coordinate the work such that excavations are trimmed to grade prior to becoming frozen.
- .4 Excavate to the required lines, grades and elevations.
- .5 Immediately notify the Owner's Representative of unsuitable organic soils or other unsuitable or unstable materials encountered during excavation and remove unsuitable materials to the depth and extent directed.
- .6 Prevent loss of soil and sloughing of slopes if springs or seepage are encountered within excavation.
- .7 Remove boulders, loose bedrock, soil blocks and other fragments that may slide or roll into excavated areas, which, in the opinion of the Owner's Representative or the Contractor, are unsafe or appear to endanger persons, work or property. The fact that such removal may enlarge an excavation beyond the required excavation lines will not relieve the Contractor from the necessity of doing such scaling and removal.
- .8 All excavation within roadways to be performed by a hydraulic tracked excavator. Earthmovers (buggies) will not be used, unless authorized by the Owner's Representative.

### **3.7 BORROW EXCAVATION**

- .1 Use all suitable materials removed by Common Excavation in embankments before taking material from borrow areas.
- .2 Obtain additional suitable embankment material from designated borrow areas.
  - .1 Owner's Representative to designate location and extent of borrow areas, and allowable depth of excavation.
  - .2 Shape edges of borrow areas on slopes of 4H:1V or flatter or as directed by the Owner's Representative and provide drainage.
- .3 Trim and leave borrow pits in a condition to permit accurate measurement of material removed.

### **3.8 DISPOSAL OF EXCAVATED MATERIAL**

- .1 General
  - .1 Obtain prior approval by Owner for stockpile areas. Strip topsoil from stockpile areas except do not strip topsoil stockpile areas.
  - .2 If stockpiling is required, stockpile materials meeting the classifications of different zones in separate stockpiles.

- .3 Prepare stockpile sites and construct stockpiles taking every precaution necessary to prevent segregation of particle sizes and contamination with other materials.
  - .4 Finish the surfaces in stockpiles to safe, stable lines and slopes 3H:1V or flatter or as directed by the Owner's Representative and leave the surfaces in a neat and workmanlike manner.
  - .5 Maintain stockpiles in a condition acceptable to Owner.
  - .6 Do not block drainage courses with stockpiled material.
  - .7 Space all stockpiles at least three metres from adjacent material stockpiles with a different classification.
  - .8 Remove all stockpiled materials from stockpiles and incorporate into the Work of the Contract.
- .2 Suitable Materials
    - .1 Load, haul and place, suitable materials from common and borrow excavations where placement of compacted and tamped fills are designated.
  - .3 Unsuitable Materials
    - .1 Load, haul and place unsuitable waste excavation materials in designated waste fills and waste sites.
  - .4 Excavated Material Disposal Sites
    - .1 The Contractor will assume ownership of the different excavated materials, not incorporated into the work. The Contractor is encouraged to recycle this waste material where practical. The Contractor will dispose of non-recycled waste material at a licensed landfill.

### **3.9 TOLERANCE**

- .1 Excavate all surfaces to within + 20 mm and - 20 mm of the lines, grades and elevations shown in the Contract Documents.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use, and placement of “Granular Materials” specified herein.
- .2 This Section is intended to be used as a reference Section; it is not a "section of work". All materials specified in Part 2, Products, may not necessarily be required.

**2. PRODUCTS**

**2.1 MATERIAL QUALITY**

- .1 Use only clean, sound, hard, durable particles, free from silt, clay, soft shale, flaky particles, topsoil, organic matter and other detrimental material. Ensure granular materials are not gap graded and have a smooth gradation curve with no excess or deficiency of any particular grain size within the required range.
- .2 Where blending is required, thoroughly mix the granular materials in such a manner that a homogeneous material of the specified gradation is achieved prior to placing of the material into the work or stockpiles.
- .3 “Gravel” in general means a mixture of natural gravel, crushed gravel or crushed stone, and natural or crushed sand, meeting the gradation limits specified below for each type.
- .4 “Crushed Gravel” means angular shaped particles of crushed gravel or stone, washed, meeting the gradation limits specified. Ensure minimum of 50% by weight, of material retained on 5 mm sieve has at least one face resulting from fracture.

**2.2 GRANULAR MATERIALS**

- .1 Granular materials to meet gradation limits specified below for each type:

<b>Granular Material Type</b>	<b>Sieve Size</b>	<b>% Passing By Weight</b>
Zone 1 – A well graded sand, typically used as a fine filter beneath structure concrete slabs, small embankment toe drains and utility indication:	10 mm	100
	2 mm	65 – 95
	1.25 mm	42 – 86
	0.16 mm	2 – 19
	0.08 mm	0 – 5
Zone 6 – Road Gravel – A well graded crushed gravel material typically used for road surfaces or as a bedding material with a 50% or greater (2 face) fracture by weight.	25 mm	100
	20 mm	85 – 100
	10 mm	35 – 75
	5 mm	15 – 55
	1.25 mm	0 – 30
	0.08 mm	0 – 12

**2.3 ASPHALT AGGREGATE**

- .1 For asphalt aggregates refer to Section 02744.

**3. EXECUTION**

**3.1 GENERAL**

- .1 Drain, clean and maintain foundation and subgrades free from debris, snow, ice, water, topsoil or any loose objectionable material. Do not proceed with granular material placement, until the Owners Representative has inspected and approved the foundations and subgrade areas.
- .2 Place granular materials to the lines, grades and elevations specified in the Contract Documents.
- .3 Suspend all granular material placement at any time when satisfactory work cannot be conducted due to rain, floods, snow or other unsatisfactory conditions.
- .4 Select temporary stockpile sites that minimize potential for contamination with underlying soils.
- .5 Stockpile material in a manner that minimizes segregation.
- .6 Replace stockpiled material that becomes contaminated, damaged, or lost at no cost to the Owner.
- .7 Refer to other Sections for location, use, and placement of Granular Materials specified herein.

**3.2 PLACEMENT**

- .1 Granular Bedding Or Granular Backfill Materials:
  - .1 Place granular material in layers not exceeding 100 mm in thickness when compacted, to the lines, grades and elevations shown in the Contract Documents. Compact to a minimum density of 95% Standard Proctor Density. Compact each layer before placing the succeeding layer. Ensure the granular material are installed within - 3% and + 3% of optimum moisture content, unless indicated elsewhere in the Contract Documents.
  - .2 If any granular bedding material is too dry to allow adequate compaction, apply water into the material until uniform distribution of moisture is obtained. Control water application accurately in amounts so that free water will not appear on surface during or subsequent to rolling or tamping.
  - .3 If the material is too wet, dry and spread material in thin lifts on subgrade and permit to dry until the moisture content is reduced to the specified moisture content.

- .4 Provide tamping with hand operated mechanical tampers such as vibratory plate tampers, jumping jacks or walk-along double drum rollers. Do not use large compaction equipment in tamped backfill zones.

**3.3 TOLERANCES**

- .1 Granular Bedding or Granular Backfill Materials
  - .1 Place granular materials within -20 mm and +20 mm of design grades, but not uniformly high or low.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location and requirement of “Subgrade Preparation” specified herein.

**2. DEFINITIONS**

- .1 “Scarification” is defined as loosing or breaking up of surface of soils with a disk, cultivator, shanks, or ripper teeth to a depth of 150 mm unless specified otherwise in the Contract Documents.

**3. PRODUCTS**

- .1 Not Applicable.

**4. EXECUTION**

**4.1 SUBGRADE PREPARATION**

- .1 Subgrade preparation includes the following work:
  - .1 Scarify, moisture condition, shape and compact the upper 300 mm of subgrade earth materials to 98% Standard Proctor Density, moisture conditioned to within -1% to +2% of optimum moisture content and to design subgrade elevation.
  - .2 When the moisture content in the subgrade material is lower than that specified, add water and mixed with the material to achieve uniform moisture content in the material to conform to the requirements.
  - .3 When the moisture content in the subgrade material is higher than that specified, dry the material by scarifying, disking, mixing and harrowing to achieve uniform moisture content in the material that conforms to the requirements.
  - .4 Remove and dispose of unsuitable materials as authorized by the Owner’s Representative. Replace with an approved suitable material and compact as specified herein.
  - .5 Maintain the subgrade to the specified section, grades and condition required for filter fabric and/or granular material placement. Provide interim drainage to prevent damage to the work and unstable conditions due to high moisture contents. No separate payment will be made for these items.
  - .6 The subgrade will pass density and proof rolling requirements prior to the placement of filter fabric and/or granular materials.

**4.2 TOLERANCES**

- .1 Shape and compact subgrade to the required cross-section and grade to within - 10 mm and + 10 mm of design elevations but not uniformly high or low, and maintain surface drainage as required to protect the work.

**END OF SECTION**

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**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location use and placement of “Geotextile Fabric” specified herein.

**1.2 SUBMITTALS**

- .1 Provide the following submittals:
  - .1 The manufacturer’s affidavit certifying that the geotextile being supplied meets the specified requirements prior to delivery to the Site.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- .1 Keep geotextile wrapped in its original packaging until immediately prior to its installation. Protect geotextile from direct sunlight, excessive heat, dirt, and rodents while in transit and storage.

**2. PRODUCTS**

**2.1 MATERIALS**

- .1 Approved Products:  
  
Mirafi N Series (Nonwoven) – or approved equal  
Mirafi RS380i (Woven) – or approved equal

**2.2 SHOP FABRICATION**

- .1 Provide shop-made sewn seams as required to produce the minimum roll widths and lengths specified. Provide seams that meet or exceed the strength properties of the geotextile. Use sewing thread that has equal or better resistance against chemical and biological degradation as the geotextile.

**3. EXECUTION**

**3.1 PREPARATION**

- .1 Excavate and prepare the subgrade to the lines, grades, and elevations specified in the Contract Documents. Remove rock fragments or other objects having sharp projections.
- .2 Remove snow, ice, loose or other deleterious materials from the subgrade.
- .3 Do not place geotextile until the prepared subgrade surfaces have been inspected by the Owner’s Representative. Rectify any defects identified by the Owner’s Representative.

### 3.2 INSTALLATION

- .1 Install geotextile products at the locations specified in the Contract Documents and in accordance with the manufacturer recommendations.
- .2 Minimum allowable overlap of the geotextile will be 1 metre. Overlap sections must be anchored sufficiently to prevent overlap separation by weather or placement of granular material.
- .3 Temporarily anchor the geotextile with sand bags or weights placed at the outer edges, along seams, and at other intermediate points as required to prevent displacement. Geotextile that extends up the sides of roadwork or excavations will be held in place with nails at 3 metre intervals, or as required.
- .4 Extend the geotextile to the outer edges to the specified lines, and trim any excess geotextile.
- .5 Protect the geotextile from damage. Repair or replace geotextile damaged during installation or construction of subsequent Work.
- .6 Do not allow any equipment to operate directly on the geotextile or the overlying material.
- .7 Cover the geotextile within 1 day of installation with the specified fill material.
- .8 During placement of the specified material, limit the height from which the fill material is placed to 0.3 m or lower, as required to avoid damaging or displacing the geotextile. Install the geotextile with sufficient slack to prevent tearing during placement of the fill material.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use, and placement of “Base Granular Materials” specified herein.

**2. PRODUCTS**

**2.1 GRANULAR BASE MATERIAL**

- .1 Granular base material will consist of sound, hard, durable, well graded crushed gravel, sand, and fine soil particles as specified.
- .2 Granular base material will not contain clay, loam, roots, plants or other deleterious materials. The materials to be well graded from coarse to fine within the gradation limits specified, and will not be subject to extreme variation between the lower and upper limits of the gradation envelope specified.

**2.2 GRADATION**

- .1 Gradation to be within the following limits when tested to ASTM C-136-82 and ASTM C117-80, and giving a smooth curve without sharp breaks when plotted on a semi-log grading chart.
- .2 Base Granular Material

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
25 mm	100%
16 mm	73 - 94%
10 mm	56 - 80%
5 mm	40 - 66%
1.25 mm	24 - 45%
0.315 mm	13 - 27%
0.160 mm	9 - 19%
0.080 mm	4 - 10%

The percent fractures by weight (2 faces) will be 60 % or greater.

**3. EXECUTION**

**3.1 PLACEMENT OF BASE MATERIAL**

- .1 Process, handle and transport aggregates to avoid segregation, contamination and degradation.

- .2 Do not place granular materials on snow, ice or frozen surfaces. Place base granular material on prepared subgrade, geotextile fabric, and/or sub-base granular materials.
- .3 Do not place the base material until the subgrade or sub-base materials have been inspected, surveyed, proof rolled, tested and approved by the Owner's Representative.
- .4 Place the base material uniformly on the approved sub-base material to compacted depths specified. Do not place the base materials in layers exceeding 150 mm compacted depth. Shape each layer to a smooth contour and compact to the specified density before placing the next layer. Areas that become segregated during spreading will be removed and replaced at the Contractor's expense. Compact the final layer of the base material to proper grade and cross-section.
- .5 Maintain the base material to the specified section, grade and condition required for the placement of other materials or as required by the Owner's Representative. Provide interim drainage to prevent damages to the work or the causing of unstable conditions due to high moisture contents.

### **3.2 COMPACTION OF BASE MATERIAL**

- .1 Granular base materials to be compacted by rolling with a pneumatic tired roller, vibratory smooth drum roller or other approved equipment.
- .2 During compaction, add water by an applicator in such quantities that the moisture content will be maintained at the optimum level as determined by Standard Proctor test. If the moisture content exceeds the optimum moisture content, aerate the material by mechanical means or cease work temporarily until the material has dried sufficiently to reach the optimum moisture content.
- .3 Compact base materials to 98% of Standard Proctor Density within - 1% and + 2% of optimum moisture content.

### **3.3 TOLERANCES**

- .1 The final surface to be even and uniformly shaped and compacted within a tolerance of -10 mm to +10 mm of established grade but not uniformly low or high, while maintaining surface drainage.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Proof Rolling” specified herein.
- .2 This Section is intended to be used as a reference Section. Provide proof rolling equipment and perform the Proof Rolling as required. Proof Rolling work is considered incidental to the Contract.

**2. PRODUCTS**

**2.1 PROOF ROLLING EQUIPMENT**

- .1 Perform proof rolling using a heavily loaded tandem truck with a vehicle weight of at least 10 tonnes (22,000 lbs.) per axle and a minimum tire pressure of 550 kPa (80 psi.)
- .2 Owner’s Representative may authorize use of other acceptable proof rolling equipment.

**3. EXECUTION**

**3.1 GENERAL**

- .1 Proof roll at level in grade indicated. If alternative proof rolling equipment is authorized, Owner’s Representative will determine level of proof rolling.
- .2 Where proof rolling reveals areas of defective subgrade, Owner’s Representative will determine limits of unsuitable subgrade excavation and specify replacement material.

**3.2 BASE PROOF ROLLING**

- .1 Perform base proof rolling immediately prior to the placement of asphalt and after the base material has been placed, shaped, graded and compacted to the specified density and moisture content. The loaded vehicle to be driven slowly (walking pace) in a systematic pattern so that each successive pass is next to or partially overlaps the previous pass. Where the area to be tested is large enough, successive passes will be conducted at right angles across the previous passes. While the test is being performed, the Owner’s Representative will observe the surface for deflections, cracking or rutting.

**3.3 TOLERANCES**

- .1 Where an area of subgrade material deflects, then rebounds more than 10 mm, the area will be deemed as failing the proof roll test. The failed areas identified by the Owner’s Representative will be repaired to a passing condition and re-tested by proof roll method again at no cost to the Owner.

- .2 Where an area of sub-base granular material deflects, then rebounds more than 10 mm, the area will be deemed as failing the proof roll test. The failed areas identified by the Owner's Representative will be repaired to a passing condition and re-tested by proof roll method again at no cost to the Owner.
  
- .3 Where an area of base granular material deflects, then rebounds more than 5 mm, the area will be deemed as failing the proof roll test. The failed areas identified by the Owner's Representative will be repaired to a passing condition and re-tested by proof roll method again at no cost to the Owner.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Trench Excavating and Backfilling” specified herein.
- .2 This Section is intended to be used as a reference section for excavating, backfilling of trenching required for installation of underground services which may include pipes, fittings, valves, manholes, vaults, catch basins, ducts, duct banks, conduits, cable, wire, etc.

**2. PRODUCTS**

**2.1 FILL MATERIALS**

- .1 General
  - .1 Do not use frozen fill materials.
  - .2 Remove cobble, stones and rock fragments have maximum dimension greater than 75 mm from fill material or other object other objects which could be detrimental to the pipe or the embedment materials.
- .2 Native Backfill Material
  - .1 Native backfill containing no debris; tree roots, sod or other organic materials.

**3. EXECUTION**

**3.1 EXCAVATION**

- .1 Excavate trenches to the lines, grades and elevations shown on the Contract Documents.
- .2 Remove unsuitable material from trench bottom to extent and depth necessary for proper installation.
- .3 Report if new construction conflicts with discovered obstruction.
- .4 Unless otherwise authorized, do not excavate more than 100 m of trench in advance of installation operations and do not leave more than 15 m open at end of day’s operation.
- .5 Stockpile suitable excavated materials required for trench backfill in approved location.
- .6 Obtain approval for method of installation.
- .7 Provide barricades and security measures required for open trench and pit excavations.

**3.2 MOISTURE CONTENT CONTROL OF BACKFILL MATERIAL**

- .1 Uniform moisture content of each layer of fill to be within -2% to +2% Optimum Moisture Content as determined by ASTM D698 test procedures.
- .2 When the moisture content in the fill material is lower than that specified for placement, add water and mix with the material to achieve uniform moisture content in the material to conform to the requirements.
- .3 When the moisture content in the fill material is higher than that specified for placement, dry the material by scarifying, disking, mixing and harrowing to achieve uniform moisture content in the material that conforms to the requirements.

**3.3 PLACEMENT AND COMPACTION OF BACKFILL MATERIAL**

- .1 Backfill trenches using fill materials as specified.
- .2 Place bedding and surround material as shown on the drawings.
- .3 Place backfill material in uniform layers not exceeding 150 mm of cover in compact thickness up to sub-grade elevation on top of trench. Compact each layer before placing succeeding layer.
- .4 In landscaped areas: compact native backfill material to a minimum density of 98% Standard Proctor.
- .5 In parking/roadways areas: compact native backfill materials to a minimum density of 98% Standard Proctor.
- .6 Compact using approved mechanical tamping, devices or by hand tamping to achieve specified compaction.
- .7 provide continuous detectable tape, ThorTec or equivalent, above all buried electrical utilities.
- .8 Approved material selected from trench excavation or other resource, unfrozen and free from cinders, ashes, sods, refuse or other deleterious materials and with the natural water content of 5% of the optimum value of the Proctor compaction specified, based on the native soil which is being used for backfill.
- .9 Natural sand or crushed rock screenings for bedding material.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use, and placement “Directional Drilling” specified herein.

**1.2 COORDINATION**

- .1 The Owner has made application for the proposed work to the appropriate regulatory authorities. Work related to this Section will not be performed until the necessary Approvals and Authorizations have been obtained.

**2. PRODUCTS**

**2.1 GENERAL**

- .1 Provide a Certificate of Compliance with the specifications to be furnished by the product pipe supplier.
- .2 The conduit to be free from visual defects.

**2.2 HIGH DENSITY POLYETHYLENE (HDPE) PRODUCT PIPE**

- .1 Conduit to comply with Canadian Electrical Code (CEC) for approval.

**3. EXECUTION**

**3.1 GENERAL**

- .1 Do not proceed with any directional drilling until approval from specific utility has been obtained by Owner.
- .2 Follow the recommendations for planning and execution of horizontal directional drilling in ASTM F1962, latest edition.
- .3 Follow accepted procedures and practices outlined in the HDD Consortium’s “Horizontal Directional Drilling Good Practices Guidelines”, latest edition as available from North American Society for Trenchless Technology, 1655 N. Ft. Meyer Dr., Suite 700, Arlington, Virginia, USA 22209, telephone (703) 351-5252, or on their web site at [www.nastt.org](http://www.nastt.org).
- .4 Abide by all stipulations and conditions included in the Approvals and Authorizations of any regulatory authorities.

**3.2 PLANNING**

- .1 Prepare directional drilling plan, outlining specific procedures and techniques that will be implemented during construction, as well as a schedule for drilling activities. Include details on drilling operations including the pilot hole drilling procedure, the reaming operation, and

the pullback procedure; specifications of equipment to be used; site layout including the location of entry and exit pits; handling of mud and cuttings; type of drilling mud to be used; past project experience of the drilling crew; annular pressure charts to confirm that the annular pressure will not exceed the overburden pressure; etc. Provide details on the installation of the “Tru Track coils” including how they are supported and the duration for which they will be deployed. Provide these plans to the Owner’s Representative at least 21 days prior to beginning any work on directional drilling. Modify as required by the Owner’s Representative.

- .2 Prepare directional drill drawings identifying proposed horizontal and vertical alignments for each directional drill. Include details on where each directional drill will daylight and how this will accommodate the fixed tie-in locations. Also identify separation between directional drills and existing gas, power and fibre optic. Provide these plans to the Owner’s Representative at least 21 days prior to beginning any work on directional drilling. Modify as required by the Owner’s Representative.
- .3 Prepare Emergency Response Plans and contingency plans for fuel and hazardous waste spills, frac-outs, sediment control, storm runoff, and floods. Provide these plans to the Owner’s Representative at least 21 days prior to beginning any work on directional drilling. Modify as required by the Owner’s Representative.
- .4 Construct utility crossing with minimum disruption.
- .5 Upon request of the Owner’s Representative, directional drill contractor will submit list of completed projects with details of type of conduit installation, size, and length of directional drill, Owner and Owner’s Representative contact names, and phone numbers.

### **3.3 CONSTRUCTION**

- .1 Advance the pilot bore along the alignment and to the grade shown on the approved directional drill Drawings, taking into account the diameter of the final bore and the diameter of the conduit pipe.
- .2 Maintain control of all drilling fluids at all times. Dispose of excess materials at a designated landfill.
- .3 Annular space will not exceed 100 mm larger than the O.D. of the product pipe for pipes of less than 200 mm diameter.
- .4 Restrict open excavation within the approved construction right-of-way to the minimum required to achieve the Work of this section.
- .5 All equipment with tracks or cleats to stay off of paved surfaces.
- .6 Backfill all access pits from bottom of excavation to pipe invert with gravel and compact to 98% of Standard Proctor Maximum Dry Density. Backfill remaining trench in accordance with typical pipeline bedding and backfill as indicated in Section 02319 – Trench Excavation and Backfilling.
- .7 Restore all disturbed areas to pre-construction conditions.

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- .8 Provide the Owner's Representative with a plot of the horizontal and vertical alignment of the pilot bore at intervals not exceeding 10.0 m.

**3.4 RECORD INFORMATION**

- .1 Provide all technical documentation, including Daily Reports with a log of boring operations and guidance system for each drill rod added or withdrawn during drilling and "as-drilled" record drawing of elevations and chainages for each bore.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Polyethylene Drain Pipe, Fittings, and Catch Basins” specified herein.

**2. PRODUCTS**

**2.1 PIPE AND FITTINGS**

- .1 For pipe sizes 75mm to 150mm in diameter all pipe, joints and pipe fittings will be manufactured from high density polyethylene resin which will meet or exceed the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C per latest revision of ASTM D1248. The pipe will have a minimum stiffness of 210 kPa at 5% deflection, in accordance with the latest revision of ASTM D2412.
- .2 Provide all pipe fittings conforming to CGSB-GP-25M.
- .3 All pipe will be joined with snap, insert or split couplers.
- .4 All high density polyethylene drain pipe will have either perforated wall or non-perforated wall.
- .5 Perforate 75 mm to 150 mm pipe will have perforations around entire perimeter to provide a minimum of 1600 square millimetre opening area per metre length.
- .6 Approved Products:
- Armtec Big ‘O’ Boss 2000 HDPE pipe and fittings

**2.2 GEOTEXTILE FILTER SOCKS FOR PERFORATED PIPE**

- .1 All geotextile filter socks will be manufactured from polyester with a minimum specific weight of 1.3.
- .2 “Regular” geotextile filter sock will weigh 83 to 115 grams per square metre in accordance with ASTM D-191 and ASTM D-231 latest revisions, and have a minimum thickness of 1.0 millimeters.

**3. EXECUTION**

**3.1 INSTALLATION**

- .1 Install high density polyethylene drain pipe to the lines and grades shown in the Contract Documents.
- .2 Install geotextile filter sock around the perforated pipe and protect from displacement, damage or clogging with dirt.

- .3 Backfill the perforated high density polyethylene drain pipe and filter sock with geotextile fabric, granular material as shown in the Contract Documents.
- .4 Ensure positive drainage into tile drain outlets as shown in Contract Documents.

**3.2 TOLERANCE**

- .1 Maintain constructed grade to within - 15 mm and + 15 mm from the lines, grades and elevations shown in the Contract Documents.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Bituminous Prime Coat, Tack Coat and Fog Coat” specified herein.
- .2 The Work covered in this Section consists of the furnishing of all labour, plant and material and performing all operations in connection with supplying and placing “Bituminous Prime Coat, Tack Coat and Fog Coat” as specified and/or in accordance with industry standards established by the Asphalt Institute.

**2. PRODUCTS**

**2.1 PRIME COAT, TACK COAT, FOG COAT**

- .1 The asphalt required will be SS-1 emulsified asphalt and SS-1H emulsified asphalt conforming to the current issue of ASTM D2028 for Asphalt, Cut Back (Rapid Curing Type) or ASTM D2027 for Asphalt, Cut Back (Medium Curing Type).

**2.2 SAND COVER**

- .1 The materials for sand cover will consist of clean granular mineral material approved by the Owner’s Representative, all of which will pass a 5mm sieve.

**3. EXECUTION**

**3.1 APPLICATION TEMPERATURE**

- .1 The application temperature of the prime, fog and tack coat will be as specified by the Manufacturer. The ambient air temperature will be at least 4 degrees C. when applying the prime, tack or fog coat.

**3.2 PRIME COAT**

- .1 Immediately prior to applying the prime coat the surface of the base course will be brought to uniform cross-section by patching all depressions and defective areas using an approved patching material and by removing all bumps and irregularities. All loose and foreign material will be removed from the surface.
- .2 The prime coat will consist of a ratio of two parts SS-1 emulsified asphalt to one part water and applied uniformly at a rate of 1.75 to 2.25 l/m<sup>2</sup>, depending on the surface's absorption characteristics. The prime coat will be applied to a uniformly damp base course when the ambient air temperature is at least 4 degrees Celsius. The prime coat will be allowed to cure for a minimum of two hours or until full curing has taken place.
- .3 To ensure uniformity of application a drip pan will be inserted under the nozzles when the application is stopped, and building paper will be spread over the treated surface to allow sufficient distance on restarting so that the nozzles are operating at full force when

the untreated surface is reached. The building paper will then be removed and destroyed. A narrow spout pouring pot or hand spray will be used to apply primer material necessary to touch up spots unavoidably missed by the distributor.

- .4 Work adjacent to the roadway will be completely protected from the application operation by a suitable covering. Any unnecessary splashing of the concrete will be cleaned at the expense of the Contractor. Maintain the primed surface until the surface course has been placed. Maintenance will include spreading any additional sand and patching any breaks in the primed surface with additional asphaltic material.

### **3.3 TACK COAT**

- .1 Apply tack coat between successive lifts of asphaltic concrete. The surface will be free from foreign material prior to application of the Tack Coat. Sweep the asphalt surface prior to the tack coating, if required. The Tack Coat will consist of a ratio of one part SS-1H emulsified asphalt to one part water and applied at a uniform rate of 0.5 litres per square metre. The Tack Coat will be allowed to cure for a minimum of two hours or until full curing has taken place.

### **3.4 FOG COAT**

- .1 The surface will be free from foreign material prior to application of the fog coat. The fog coat, if required, will consist of a ratio of one part SS-1H emulsified asphalt to one part water and applied at a uniform rate of 0.5 l/m<sup>2</sup>. The fog coat will be allowed to cure for a minimum of two hours or until full curing has taken place.
- .2 Traffic may be permitted to run on the completed fog coat immediately after the asphalt has cured.

### **3.5 SAND COVER**

- .1 The prime coat should preferably be entirely absorbed by the base course and therefore require no sand cover. If, however, the asphalt has not been completely absorbed 24 hours after application, then just sufficient sand will be spread over the surface to blot up excess prime coat and prevent it from being picked up by any traffic.

### **3.6 EQUIPMENT**

- .1 The pressure distributor used for applying asphaltic material will distribute the asphaltic material in a uniform spray without atomization, in the amount and between the limits of temperature specified. Suitable means for accurately indicating the temperature of the asphaltic material will be provided at all times.
- .2 The thermometer well will be so placed as not to be in contact with a heating tube. The distributor will be so designed that the normal width of application will be not less than 2 metres with provision for the application of lesser width when necessary.
- .3 If provided with heating attachments the distributor will be so equipped and operated that the asphaltic material will be circulated or agitated throughout the entire heating process.

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- .4 The distributor will be equipped with a speed indicator registering metres per minute and a meter registering litres per minute passing through the nozzles. Both of these gauges will be readily visible to the operator of the distributor.

**3.7 DEFICIENT APPLICATION**

- .1 Areas that have uneven, non uniform, excessive or deficient application will be repaired immediately at the expense of the Contractor.

**3.8 QUALITY OF MATERIALS**

Submit data from an independent accredited testing laboratory as required by the Engineer to substantiate that the quality of materials proposed meet these specifications. Provide manufacturer's data as requested by the Owner's Representative.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Hot Mix Asphaltic Concrete” specified herein.
- .2 The Work includes the supply of aggregates and asphalt cement, asphalt plant mixing, transporting, placement, finishing and compaction to requirements specified herein.
- .3 Asphalt concrete Type I and Type II of this specification will be used for construction of Arterial and Collector roadways or other high loading applications, as designated by the Owner.
- .4 Asphalt concrete Type III of this specification will be used for construction of Residential roadways or other low traffic areas, as designated by the Owner.

**1.2 DEFINITIONS**

- .1 “Hot Mix Asphalt (HMA)” refers to the mixture of aggregates, asphalt cement and other additives.
- .2 “Recycled Asphalt Product (RAP)” is defined as recycled asphalt product that is obtained from the cold milling of hot mix asphaltic concrete
- .3 “A Lot” is a portion of the work being considered for acceptance, and is defined as one day of plant production for each mix type. Any portion of the work may be deemed a lot at the discretion of the Owner’s Representative.
- .4 “Job Mix Formula (JMF)” is defined as the aggregate proportioning (including RAP), target gradation, asphalt content and air void content from the Mix Design that subject to approval by the Owner’s Representative.
- .5 “Asphalt Binder” represents the principle binding agent in HMA and includes asphalt cement as well as any material added to modify the original asphalt cement properties.

**1.3 SAMPLES**

- .1 Provide the Owner’s Representative access to all production processes and materials used for the work to monitor material quality as often as deemed necessary. Such inspection and testing shall not in any way relieve the Contractor of the responsibility for meeting the requirements of this specification.
- .2 Aggregate:
  - .1 At least two (2) weeks prior to commencing work, inform the Owner’s Representative of proposed source of aggregates and provide access for sampling.

- .2 Asphalt Binder:
  - .1 At least four (4) weeks prior to commencing work submit to the Owner's Representative one 5L container of asphalt binder proposed for use.
  - .2 Submit asphalt binder samples in new metal containers.
  - .3 Identify the supplier of the asphalt binder.

**1.4 SUBMISSIONS**

- .1 Submit proposed asphalt concrete mix design and trial mix design results to Owner's Representative for review and approval at least two (2) weeks prior to commencing.
- .2 Submit new mix design at least two (2) weeks prior to contemplated change in source of asphalt cement or aggregate.
- .3 Trial mix designs will be performed by an independent testing consultant and submitted under the signature and professional seal of a qualified materials engineer to the Owner's Representative.

**1.5 DELIVERY AND STORAGE**

- .1 Aggregates:
  - .1 Deliver and stockpile aggregates in accordance with the requirements of this Section.
  - .2 Stockpile minimum of 50% of the total amount of aggregate required before commencing production of trial mix design.
  - .3 Handle and transport aggregates to avoid segregation, contamination and degradation.
  - .4 Stockpile aggregates in sufficient quantities to meet project schedules. When hauling into stockpiles after plant mixing commenced, do not deposit material against working face of stockpile.
  - .5 Separate aggregate stockpiles by substantial dividers or stockpiles far enough apart to prevent intermixing.
  - .6 Reject intermixing or contaminated materials. Remove and dispose of rejected materials as directed by the Owner's Representative within 48 hours of rejection.
  - .7 Construct stockpiles in uniform lifts using trucks or rubber tired loading equipment, being careful to avoid segregation by spillage of material over the ends of previously placed lifts. Do not use conveyors or tracked equipment in stockpile construction.

- .8 Provide a previously stabilized stockpile base or provide a compacted sand base not less than 300mm in depth to prevent contamination. Alternatively, stockpile aggregates on ground but do not incorporate bottom 300mm of pile into work.
- .2 Asphalt Binder:
  - .1 Provide approved storage, heated tanks and pumping facilities for asphalt binder.
  - .2 Provide, upon request, freight and waybills for asphalt binder shipments received.
  - .3 Stockpile minimum of 100% of total amount of RAP required before commencing production of trial mix design.
  - .4 Handle and transport RAP to avoid segregation, contamination and degradation.
  - .5 Separate aggregate and RAP stockpiles by substantial dividers or stockpiles far enough apart to prevent intermixing.
  - .6 Reject intermixing or contaminated materials. Remove and dispose of rejected materials as directed by the Owner's Representative within 48 hours of rejection.
  - .7 Conveyors may be allowed to stockpile RAP subject to approval by the Owner's Representative. No equipment will be allowed on the RAP stockpile. Construct stockpiles being careful to avoid segregation by spillage of material over the ends of previously placed lifts.
  - .8 Provide free draining gravel stockpile base not less than 300mm in depth to prevent contamination of RAP.

**2. PRODUCT**

**2.1 MATERIALS**

- .1 Aggregates:
  - .1 Coarse aggregate is aggregate retained on the 5,000µm sieve and fine aggregate is aggregate passing the 5,000µm sieve.
  - .2 Aggregate material will be crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps cementation, organic materials, frozen material and any other deleterious materials.
  - .3 Gradations to be within limits specified, when tested to ASTM C-136 and ASTM C-117 with sieve sizes to CAN/CGSB 8-GP-2M rather than ASTM E11.
  - .4 Aggregates from source will be processed to meet the following requirements:

- .1 Natural fines pre-screened and stockpiled with more than 10% of material retained on 5,000µm sieve and 100% passing the 10,000µm sieve.
- .2 Pre-screened aggregates delivered to crushing plant will be pre-screened and will contain not more than 5% passing the 5,000µm sieve.
- .3 Crushed aggregates will be separated and stockpile in accordance with the following:
  - .1 Coarse aggregates to contain not more than 10% of materials passing the 5,000µm sieve.
  - .2 Fine aggregate to contain not more than 20% of the materials retained on the 5,000µm sieve.
- .5 Physical properties of aggregates to meet the following requirements:

<b>Aggregate Physical Property Requirements</b>		
<b>Requirement</b>	<b>ASTM Test Standard</b>	<b>Tolerance</b>
Micro Deval (% Loss) Coarse Aggregate	D6928	15 Max.
Micro Deval (% Loss) Fine Aggregate	D7428	20 Max.
Lightweight Particles (%)	C123	1.5 Max

- .6 Blend Sand:
  - .1 To consist of natural or manufactured sand passing 5,000 µm sieve.
  - .2 Stockpile volumes will be maintained to ensure a minimum of 5,000 tonne of plant mix production at all times.
- .7 Blended Aggregates:
  - .1 Aggregate gradation requirements, to meet the following requirements:

<b>Blended Aggregate Gradation Requirements</b>		
<b>Sieve Size (µm)</b>	<b>Percent Passing</b>	
	<b>Type L1</b>	
	<b>Max</b>	<b>Min</b>
12,500	100	--
10,000	92	83
5,000	70	55
1,250	45	26
630	38	18
315	30	12
160	20	8
80	10	4

.2 Combining of Aggregates

Coarse aggregate, manufactured sand, natural sand as well as blend sand and mineral filler, if required, to be fed to plant through calibrated mechanical feeders.

Gradation of aggregates when blended to job mix formula to be within limits specified herein and giving a smooth curve without sharp breaks when plotted on semi-log grading chart.

**2.2 ASPHALT BINDER**

.1 Performance Graded Asphalt Binder:

.1 To meet the requirements of AASHTO M 320, “Standard Specification for Performance Graded Asphalt Binder”.

- .2 Approved Product:
- o PG 46-34 for Runway and Taxiway
  - o PG 58-34 for Aprons
  - o or approved equal

.3 Antistrip will be included in all Asphalt Binders.

**2.4 PAVEMENT MIXTURES**

.1 Design and prepare hot-mixed, hot-laid pavement mixtures utilizing asphalt cement and aggregate in accordance with ASTM D3515-96, and to meet the Marshall Mix Design Schedule, as follows:

<b>PROPERTY</b>	<b>Alberta Transportation Mix “L1”</b>
Marshall Stability @ 60°C; kN	5.3
Marshall Flow @ 60°C; 0.25mm Units	8 - 16
Voids in Mineral Aggregate, %	13.5 min.
Air Voids in Mixture, %: Design Range:	3.5 – 4.0
Asphalt Film Thickness, mm	6.7

.2 Test Standards

- Percent V.M.A. – minimum compaction 50 blows each face (mechanical compactor).

- Marshall Stability, N – at 60° Celcius, compaction 50 blows each face (mechanical compactor).
- Flow – measured at point where the load just begins to decrease.
- Percent Air Voids – that portion of asphalt cement absorbed into the aggregate shall be compensated for in the calculation.

The design asphalt cement content used shall be determined at 4% air voids. The test properties at this asphalt content are then checked to ensure compliance with the respective criteria. Alternate designs may be considered at the sole discretion of the Material & Research Owner's Representative. No design will be approved having a film thickness less than those specified.

Asphalt cement contents shall be established for a calculated minimum specified film thickness on both the fine (AC<sup>f</sup>) and coarse (AC<sup>c</sup>) sides of the mix gradation envelope.

Design asphalt cement content shall govern on all compliance testing except where the minimums cited above are not met.

- .3 Before any mix shall be used a laboratory design mix formula for each class of asphalt hot mix to be placed on work shall be developed. A compliance design mix formula consists of an envelope gradation within the range of values of Conventional Mixes. At no time shall the filler content (passing 80 micron) exceed 20 percent of the fine aggregate fraction (passing 2.36mm). Density values shall be established by the Marshall Method – 50 blows with mechanical compaction. Bulk specific gravity shall be determined using oven dried aggregate.

The percentages of aggregate include mineral filler, when used, and refer to the completed dry mix. The percentages of asphalt cement refer to the complete asphalt concrete mixture. All percentages are by weight.

At least (7) days prior to the use of any mix on work covered by these Specifications the Contractor shall provide the Owner's Representative with a sample minimum weight of 60 kg, of the mix to be used. The Owner's Representative shall cause the sample to be tested by an approved independent testing laboratory to assure compliance to each and every applicable design Specification. When the testing indicates such compliance, the Owner's Representative shall approve in writing the use of the mix. Thereafter, the test results shall constitute the design mix formula for the mix for purposes determining deviations and variations.

Do not use any mix not covered by these Specifications without the written approval of the Owner's Representative.

Any deviation from any standard shall be cause for refusal.

- .4 All mixtures shall be supplied to the approved job mix formula within the range of tolerances specified.

Asphalt cement content:  $\pm 0.3\%$  of the design mix within a test lot.

Aggregate Gradation:

<b>AGGREGATE PASSING SIEVE SIZE (Micron)</b>	<b>TOLERANCE (% PASSING BY WEIGHT)</b>
160 and coarser	± 3.0
80	± 1.0

Temperature: Mix temperature at point of plant discharge shall not vary from that specified in the job mix formula by more than 10° C.

Moisture in Mix: Maximum permissible moisture, at point of plant discharge, is 0.2 percent by weight of mix.

A qualified testing firm shall perform all trial and job mix designs and all data shall be submitted under the seal of a Professional Engineer.

The approved job mix formula shall not be changed without prior approval of the Owner's Representative. Should a change in a material source be required, then at least three (3) working days in advance of proposing to use the new mix submit the new job mix formula for review by the Owner's Representative.

### **3. EXECUTION**

#### **3.1 CONTINUITY OF PRODUCTION**

- .1 During the time period that work is in progress on any project for which this specification is in effect, and at the discretion of the Owner's Representative, the plant may be limited to producing only the mix type required for that project.

#### **3.2 PREPARATION OF HOT MIX MATERIAL**

- .1 Preparation of Mineral Aggregate:
  - .1 The mineral aggregates will be dried to ensure the mix is discharged containing not more than 0.2 percent moisture, heated so that when delivered to the mixing unit, they will be at as low a temperature as is consistent with proper mixing and laying and in no case to exceed 163° C. The mineral aggregate may be fed simultaneously into the same dryer, but in all cases immediately after heating, they will be screened into bins.
  - .2 Where reclaimed asphalt pavement (RAP) will be incorporated into the mix, the virgin aggregate may be heated to a higher temperature such that when dry mixed with the RAP the temperature is less than 163° C. The RAP will be passed over a 50mm screen prior to entering the plant.

- .3 For batch plants RAP will be introduced into the weigh hopper after some aggregate has been weighed. For approved drum or continuous plant RAP will be introduced through a calibrated cold feeder.
- .2 Preparation of Asphalt Cement:
  - .1 The asphalt cement will be carefully heated to a specified temperature between 118° C and 150° C depending on the temperature viscosity relationship, by approved means designed to secure uniform heating of the storage tank. The temperature differential aggregates and asphalt cement will at no time be more than 4° C.
- .3 Composition of Mixture:
  - .1 The mineral aggregate and asphalt cement will be mixed in a manner to produce a homogeneous mixture in which all particles of the mineral aggregate are uniformly coated and in such proportions as to produce a mixture having asphalt cement content as indicated by the approved JMF. When the mixture is prepared in a twin pug mixer, the volume of mineral aggregate and asphalt cement will not be so great as to extend above the tops of the mixer blades when the blades are in a vertical position.
  - .2 After the hot aggregate and mineral filler have been charged into the mixer, and thoroughly mixed for a period of not less than fifteen (15) seconds, as directed by the Owner's Representative, the asphalt cement will be added and the mixing continued for a period of at least twenty-five (25) seconds, and not more than forty-five (45) seconds.
  - .3 Asphalt cement recovered from freshly produced hot mix by the Adson Method, ASTM D1856, and subsequently tested in accordance with ASTM D5, will retain a minimum value of fifty percent (50%) of its original penetration value.

### **3.3 COMPLIANCE WITH SPECIFICATIONS**

- .1 Aggregate Gradation:
  - .1 When the gradation does not comply with tolerances set forth in Section 2.1.1 of this specification, the Owner's Representative will initiate the following action:
    - .1 When two (2) consecutive gradation analyses identify non-compliance with the specified tolerances, the Contractor will be served notice and a third test will be initiated.
    - .2 If continued non-compliance is indicated from the third test, the Contractor will suspend production. He will not commence production again until he has demonstrated that corrective action has been taken and that the aggregate gradation is within the specified tolerance limits.
- .2 Asphalt Temperature:
  - .1 Plant mix which does not meet temperature requirements of Section 2.1.2, at the point of plant discharge will be rejected.

### 3.4 PREPARATION FOR PAVING

- .1 General:
  - .1 The Contractor will give the Owner's Representative a minimum of six (6) hours notice of his intention of commencing paving over any previously approved primed or tacked surface.
  - .2 The hot asphaltic mixture will be laid upon a dry firm base, true to grade and cross-section and free from all screening or other loose or foreign material. No hot mix will be spread when the sub-base is wet or when other conditions prevent proper spreading, finishing or compaction.
  - .3 If undercutting, and subsequent backfill with asphaltic concrete is done, the backfill operation will be performed sufficiently far ahead of the paving operation to allow the asphaltic concrete time to cool down enough to support equipment.
- .2 Asphalt Placing Temperature:
  - .1 No asphalt will be dispatched to the field unless the temperature as issued by Environment Canada, is rising and meets the following minimum temperature requirements:

<u>Depth of Asphalt</u>	<u>Minimum Air temperature</u>
25 mm	10° C (night temp. 0° C or lower)
35 mm	7° C (night temp. above 0° C)
50 mm	5° C
75 mm	2° C
100 mm	Compaction Requirements will govern
150 mm	Compaction Requirements will govern
  - .2 A tolerance will be permitted for plant start-up temperature.
  - .3 No surface lift asphalt will be placed regardless of temperature until the road base is 5°C or higher.
- .3 Hours of Operation:
  - .1 No loads of asphalt will be dispatched from the plant after sunset or during hours of darkness unless loads can be placed and compacted in accordance with these specifications, and suitable artificial illumination is provided, all subject to the approval of the Owner's Representative.
- .4 Transportation of Hot Asphaltic Mixtures:
  - .1 To protect the load from adverse weather conditions during transit, trucks will carry at all times tarpaulins of sufficient weights and size to cover the entire open

area of the truck box. Regardless of weather conditions, tarpaulins will be used when ordered by the Owner's Representative.

- .2 Vehicles used for the transportation of hot mix asphalt from the plant to the site of work will have tight metal boxes previously cleaned of all foreign matter, the inside surface may be lightly lubricated with a thin oil or soap solution just before loading. Excess lubrication will not be permitted.
- .3 For purposes of checking asphalt mixture temperatures, trucks will have an accessible 13mm diameter hole drilled into the driver's side of the truck box, at a distance of 0.3m from the bottom of the box and 150mm clear of the reinforcing ribs.
- .4 The speed and weight of hauling trucks will be regulated so that, if in the opinion of the Owner's Representative, no damage will occur to any portion of the work underway. Any damage to the prime coat or the bituminous mat caused by the Contractor's equipment will be repaired by the Contractor at his own expense.

### 3.5 SPREADING AND FINISHING EQUIPMENT

- .1 Asphalt Spreader:
  - .1 The track mounted spreading machine will be self-propelled and capable of placing a uniform layer of asphalt mix to a depth shown on the plans or as ordered by the Owner's Representative.
  - .2 The screed will include a tamping bar or vibratory strike-off device for use when required. The screed will strike-off the mix to the depth and cross-sections specified and produce a finished surface of uniform texture.
  - .3 Control of the screed will be by automatic sensing devices. Longitudinal control will be accomplished by a sensor, which follows a string-line, ski, or other reference. The grade sensor will be movable and mounts provided so that grade control can be established on either side of the paver. A slope control will also be provided to maintain the proper transverse slope of the screed.
- .2 Hand Tools:
  - .1 Only lutes will be used during the spreading operation and when the asphalt is worked by hand in areas in which the paver cannot reach.
  - .2 Tamping irons used to consolidate the material along curbs, gutters and other structures inaccessible to the rollers will not weigh less than 11 kg and will have a bearing area not exceeding 310 sq. cm. Mechanical compaction equipment, satisfactory to the Owner's Representative, may be used instead of tamping irons.
  - .3 For purposes of checking the finished surface, Contractors must provide and carry on each paving machine a 3 metre straight edge with an attached level.
  - .4 The Contractor will supply propane torches for heating joints.

### 3.6 SPREADING OPERATIONS

- .1 Pre-levelling for Asphalt Concrete:
  - .1 Pre-levelling of uneven or broken surfaces over which asphalt concrete is to be placed will be accomplished by the use of asphaltic concrete placed with a grader, paver, hand or by a combination of these methods as directed by the Owner's Representative.
  - .2 After placement, the asphalt concrete used for pre-levelling will be compacted thoroughly with a pneumatic-tired roller.
- .2 Asphalt Spreading Operation:
  - .1 The asphaltic concrete will be laid to the design thickness as shown on the contract drawings or as specified. New construction where an established; i.e. curb, is lacking, a string-line reference will be required. The maximum spacing between string-line stakes will not exceed 10 metres. The line will be tensioned to 450 N and secured. Adjacent mats on the same lift are to be controlled by use of the grade sensor. No relaxation of the above procedure will be permitted without written approval of the Owner's Representative.
  - .2 The spreader will be operated in such a manner as to distribute the asphaltic concrete mix to proper cross-section, width and thickness without causing segregation of the mix. Small segregated areas that may occur will be corrected immediately. The forward motion of the spreader will be controlled so that no irregularities in the pavement surface caused by excessive speed. The rate of placement of the mixture will be uniform, and will be co-ordinated with the production rate of the asphalt plant without intermittent operation of the spreader.
  - .3 Any failure of the machine to produce a smooth, uniformly dense mat, free from irregularities, will be corrected immediately to the satisfaction of the Owner's Representative.
- .3 Areas Inaccessible to Spreaders:
  - .1 Areas that are inaccessible to the spreading machine may be paved by other methods, as directed by the Owner's Representative. Graders or approved types of truck-attached spreaders will be used to pave inaccessible or irregularly shaped areas. Hand raking will be kept to a minimum.
  - .2 In small areas or where the use of mechanical equipment is not practical, the mix may be spread and finished by hand. The asphaltic mixture will be dumped on the area and immediately thereafter distributed into place by shovels and spread with lutes in a loose uniform layer of uniform density and correct depth. Material must be handled so as to avoid segregation. Excessive oiling of tools will not be tolerated. Loads will be dumped any faster than can be adequately distributed by the rakers. Raking must be carefully and skilfully done, in such a manner that after the first passage of the roller over the mixture, a minimum amount of additional patching will be required.

### 3.7           **COMPACTION EQUIPMENT**

- .1     The Contractor will supply sufficient compaction equipment to:
  - .1     Provide a compaction rate that will equal or exceed the placing rate of the spreader spreader.
  - .2     Ensure full compaction of the asphaltic concrete before the temperature of the mat falls below 80° C.

### 3.8           **COMPACTION PROCEDURES**

- .1     General:
  - .1     The rollers will be kept in continuous motion while on the hot mat in such a manner that all parts of the pavement receive equal compression.
  - .2     The surface of the mixture after compaction will be smooth and true to established section and grade. Areas of .09 sq. m. or more in which any mixture shows an excess or deficiency of asphalt, or uneven distribution of asphalt due to insufficient mixing, or which become loose, broken, ravelled, mixed with dirt, or is in any way defective, will be removed and replaced with fresh asphalt at the Contractors' expense and be immediately compacted to conform with the surrounding area.
  - .3     Areas inaccessible to the roller will be compacted with mechanical or hand tampers.

### 3.9           **JOINTS**

- .1     Longitudinal and Transverse Joints:
  - .1     Longitudinal and transverse joints will be made in a careful manner.
  - .2     Paving joints will not be placed in the same vertical plane. Longitudinal joints will be offset at least 150mm and transverse joints will be offset at least 2.0m.
  - .3     Edges which additional pavement is to be placed will be vertically formed to true line. A lute will be used immediately behind the paver when required to obtain a true line and vertical edge.
  - .4     The exposed edges of all cold asphalt joints and the face of the concrete curb and gutter will be cleansed and painted with a thin coat of asphalt tack oil.
  - .5     In making the joint along any adjoining pavement and after the hot mixture is placed by the finishing machine, just enough of the material will be carried back to fill any space left open. This joint will be properly "set up" with the back of the lute at proper height and level to receive the maximum compression under the rolling.

- .6 At the end of each day's paving of the surface course and upper lift of the base course mix, the uncompleted paving mats will be provided with vertically cut transverse joints. Joints between old and new pavements or between successive days' work will be carefully made in such a manner as to ensure a thorough and continuous bond between the old and new surfaces.

### 3.10 SURFACE SMOOTHNESS

- .1 General:
  - .1 The completed surface of the top or wearing surface will be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. Tolerances in both profile and crown are:
    - .1 Base Course - 10mm in 5 m
    - .2 Surface Course - 6mm in 5 m
  - .2 When the surface smoothness does not comply with tolerances, the pavement surface will be corrected by the addition of asphalt concrete mixture of an appropriate class to low places or the removal of material from high places by methods satisfactory to the Owner's Representative. Correction of defects will be carried out until there are no deviations anywhere greater than the allowable tolerances.
- .2 Repair of Defective Areas:
  - .1 Asphalt spreaders will be required for areas greater than 90 sq. m. The required equipment will be on site before placing of asphalt hot mix may commence.
  - .2 Where sixty percent (60%) of the road requires patching and/or several other patches are required across the width of the street it will be necessary to extend the treatment across the full width of the street.
  - .3 Placing of a patch on top of another will not be acceptable and in these cases the original asphalt must be removed.
  - .4 Where, in the opinion of the Owner's Representative, possible bridging exists, it will be necessary to remove the asphalt and the defective area. The base course will be brought back up to proper grade and use full depth asphalt patching.
  - .5 All patches should be square with no jagged edges.
  - .6 Asphalt patches should retain the proper cross-section and the edges will be properly feathered out.
  - .7 Asphalt skin patching will be subject to the temperature requirements for asphalt surfacing.

**3.11 TESTING**

.1 Quality Control:

- .1 Quality control is the responsibility of the Contractor throughout every stage of the Work from aggregate processing to the final accepted product. Tests performed by the Owner's Representative will not be considered as quality control tests.
- .2 The Contractor will be totally responsible for production of materials and construction that meet all specified requirements.
- .3 All quality control will be conducted by qualified personnel. The Contractor will bear the cost of all quality control testing and consulting services.
- .4 Pre-Production Quality Control Requirements are as follows:

Quality Control Requirement	Test Standard	Minimum Frequency
Asphalt Cement Certification	--	Once per Year or for change in supplier
Aggregate Physical Properties	See 2.2.5	Once per Year or for change in source
Crushed Coarse Aggregate Gradation Analysis and Fracture Content Manufactured Sand Aggregate Gradation Natural Fine Aggregate Gradation Blend Sand Aggregate Gradation	ASTM C 136 ASTM D 5821  ASTM C 117 ASTM C 126 ASTM C 117 ASTM C 126 ASTM C 117 ASTM C 126	One for every 1000 tonne of each class of material processed into stockpile, or one analysis for each material every production day when production rate is less than 1000 tonne.
Reclaimed Asphalt Pavement (RAP) Asphalt Content and Extracted Aggregate Gradation	ASTM D 2172 ASTM C 117 ASTM C 136	One for each 500 tonne delivered to stockpile, or one for each location when delivery rate is less than 500 tonne
Penetration of asphalt cement recovered from RAP by Abson Method	ASTM D 1856 ASTM D 5	One for each 2000 tonne delivered to stockpile
Trial Mix Design by Marshall Method	ASPHALT INSTITUTE MS-2	One per mix type every 3 years, or as required for a change in asphalt cement supply, aggregate gradation or aggregate source. *
Plant Calibration	--	As required

\* A laboratory/plant JMF verification is required each year when a trial mix design is not conducted.

- .5 Pre-Production Quality Control test data will be reported to the Owner's Representative one week prior to commencing the project, or as requested.

.6 Post Production Quality Control Requirements are as follows:

<b>Quality Control Requirement</b>	<b>Test Standard</b>	<b>Minimum Frequency</b>
Hot Mix Asphalt Analysis (including Asphalt Content, Aggregate Gradation, Marshall Density and Void Properties)	ASTM D 6307 ASTM C 117 ASTM C 136 ASTM D 3203	One for every 500 tonne of each mix type supplied under this specification. *
Quality Control Charts (including 3 test running average for Binder Content, Aggregate Gradation, Marshall Density and Void Properties)	--	For each hot mix analysis. Test results and updated 3 test running average to be submitted to the Owner's Representative as they become available.
Hot Mix Asphalt Temperature	--	Minimum frequency not specified.
Cold Feed Aggregate Analysis	ASTM C117 ASTM C 136	Minimum frequency not specified.
Maximum Relative Density of Hot Mix Asphalt	ASTM D 2041	Minimum frequency not specified.
Compaction Monitoring (Core or Nuclear Density)	ASTM D 2726 ASTM D 2950	Minimum frequency not specified. **

\* Where an individual test indicates non-compliance, another test shall be initiated immediately.

\*\* Coring is subject to approval by Owner's Representative.

.7 Post-Production Quality Control test data will be reported to the Owner's Representative daily as the work proceeds.

.2 Quality Control Compliance:

.1 Asphalt Content, Aggregate Gradation and Mixture Properties

.1 The test data derived by Post-Production Quality Control mix testing, will be compared to the tolerances set forth in the production tolerances, Section 2.4, of this specification. The Contractor will document, and make available to the Owner's Representative, any adjustments made to correct noncompliance with the specified tolerances.

.2 The Contractor will suspend mix production when the 3 test running average for any property is outside of the specified tolerance limits for three consecutive tests. Supply will not commence again until it is demonstrated that corrective action has been taken.

.2 Hot Mix Asphalt Temperature

.1 Plant mix that does not meet temperature requirements of the production tolerances, Section 2.4, at the point of plant discharge will be subject to rejection at the discretion of the Owner's Representative.

.3 Acceptance Sampling and Testing:

- .1 Within this specification, certain requirements, limits and tolerances are specified regarding supplied materials and workmanship. Compliance with these requirements will be determined from acceptance testing as described in this section.
- .2 Acceptance testing is the responsibility of the Owner’s Representative.
- .3 Initial acceptance testing will be undertaken free of cost to the Contractor.
- .4 A lot is a portion of the work being considered for acceptance, and is defined as one day of plant production for each mix type. Any portion of the work may be deemed a lot by the Owner.
- .5 Acceptance Testing requirements are as follows:

<b>Quality Acceptance Requirement</b>	<b>Test Standard</b>	<b>Minimum Frequency</b>
Hot Mix Asphalt Analysis (including Binder Content, Aggregate Gradation, Marshall Density, Maximum Relative Density, Void Properties, Marshall Stability and Flow)	ASTM D 6307 ASTM C 117 ASTM C 136 ASTM D 2041 ASTM D 3203	For each mix type, one test for each 3500 sq.m. of placement, or three tests per lot, whichever is greater.
Compaction Testing (Core Density) and Thickness Determination	ASTM D 2726 ASTM D 3549	For each mix type, one test for each 2000 sq.m. of placement, or three tests per lot, whichever is greater.
Hot Mix Asphalt Temperature	--	No minimum frequency.

.6 Acceptance Sampling Procedures:

- .1 Loose mix samples will be acquired from the Work site in accordance with Alberta Transportation Test (ATT) procedure ATT- 37. Auger samples may be used if approved by both the Owner’s Representative and the Contractor.
- .2 The timing of mix sampling will be stratified, with each sample representing a similar production quantity.
- .3 Core locations will be selected using stratified random sampling procedures. The lot will be divided into segments meeting or exceeding the minimum frequency indicated in the Acceptance Testing requirements (Section 3.11.3) and of approximately equal area. In each segment, a test site will be located using random numbers to determine the longitudinal and transverse coordinates.

- .4 Areas within 3m of transverse joints, or 0.3m of a mat edge, are excluded from compaction acceptance sampling and testing.
- .7 Reporting Protocols
  - .1 Test reporting accuracy will be as stipulated in the referenced test procedures, including:
    - .1 Gradation to the nearest whole number, except the percent passing the 80mm sieve, which will be reported to the nearest 0.1%.
    - .2 Binder content to the nearest 0.01%
    - .3 Air voids and compaction to the nearest 0.1%.
    - .4 Thickness to the nearest whole millimeter (mm).
  - .2 Lot averages will be reported to the same accuracy as test results.
- .4 Appeal of Acceptance Testing Results:
  - .1 General
    - .1 The Contractor may appeal the results of acceptance testing for Compaction Standard, Asphalt Content or Air Voids for any lot subject to rejection or unit price reduction. The notice of appeal will be in writing and submitted to the Owner's Representative within 48 hours of receipt of the acceptance testing results.
    - .2 Appeals will only be considered if cause can be shown and the post-production quality control requirements have been satisfied and all quality control testing was completed by a laboratory certified by the Canadian Council of Independent Laboratories (CCIL)
    - .3 Quality Control tests initiated after the Contractor's receipt of the acceptance test results will not be considered when evaluating cause for appeal.
    - .4 Only Quality Control testing during production for the subject project will be considered when evaluating cause for appeal.
  - .2 Asphalt Content Appeal
    - .1 A stratified random sampling plan will be developed by the Owner's Representative with the same number of segments as the original number of samples for the subject lot. Sufficient core sample will be acquired from each segment to enable asphalt content determinations.
    - .2 For asphalt content appeal testing, the Contractor will have the option for the testing to be done by the testing laboratory undertaking the project acceptance testing, or an independent testing laboratory selected by the Owner's Representative.

- .3 The average of the appeal test results will be used for acceptance and unit price adjustment, and shall be binding on both the Owner and the Contractor.
- .4 If the average appeal test result verifies that any unit price reduction or rejection applies for that Lot, the costs of the appeal sampling and testing will be borne by the Contractor. If the results show that a penalty or rejection no longer applies, the sampling and appeal costs will be the responsibility of the Owner.

.3 Compaction Standard or Air Void Appeals

- .1 The testing laboratory conducting the project acceptance sampling and testing will routinely retain companion samples sufficient for the determination of maximum relative density and/or Marshall density.
- .2 For compaction standard or air void (Marshall density) appeal testing, the Contractor will have the option for the testing to be done by the testing laboratory undertaking the project acceptance testing, or an independent testing laboratory selected by the Owner's Representative.
- .3 The average of the appeal tests will be used for acceptance and unit price adjustment, and will be binding on both the Owner and the Contractor.
- .4 If the new compaction standard verifies that any unit price reduction or rejection applies for that Lot, the costs of the appeal sampling and testing will be borne by the Contractor. If the result shows that a unit price reduction no longer applies, the appeal testing costs will be the responsibility of the Owner.
- .5 If the new average air void content result verifies that any unit price reduction applies for that Lot, the costs of the appeal testing will be borne by the Contractor. If the results show that a unit price reduction no longer applies, the sampling and appeal costs will be the responsibility of the Owner.

.4 Core Density and Thickness Appeals

- .1 Core density and thickness appeals will only be considered if a case can be made that the stratified random sampling plan was biased or testing was in error.

**3.12 END PRODUCT ACCEPTANCE OR REJECTION**

.1 General:

- .1 The Contractor will provide an end product conforming to the quality and tolerance requirements of this specification. Where no tolerances are specified, the standard of workmanship will be in accordance with accepted industry standards.

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- .2 Acceptance of any Lot at full or increased payment will occur if there are no obvious defects and the Lot mean results for asphalt content, pavement density, air voids and thickness meet or exceed the specified tolerances.
- .3 Unit price reductions will only be applied on the basis on full acceptance testing in accordance with the Acceptance Testing Requirements Section 3.11.3.5

.2 Asphalt Content:

- .1 For full payment, the Lot Mean Asphalt Content must be within  $\pm 0.30\%$  of the approved JMF value.
- .2 Payment adjustment for asphalt content is as follows:

<b>Asphalt Content Deviation from JMF Value (%)</b>	<b>Payment Adjustment Factor (PA<sub>AC</sub>)</b>
$\pm 0.30$ or less	1.00
$\pm 0.31$ to $\pm 0.50$	As per Chart A
Greater than $\pm 0.50$	Reject *

\* Subject to removal and replacement at the discretion of the Owner's Representative.

.3 Pavement Compaction:

- .1 For full or increased payment, the Lot Mean Pavement Compaction must be equal to or greater than 93% of the Lot Mean Maximum Relative Density.
- .2 Payment adjustment for pavement compaction is as follows:

<b>Pavement Compaction % of Maximum Relative Density</b>	<b>Payment Adjustment Factor (PA<sub>COM</sub>)</b>
94.6 to 95.5 *	1.00
93.5 to 94.5 *	1.00
93.0 to 93.4	1.00
90.0 to 92.9	As per Chart B
Less than 90.0	Reject **

\* Where no individual test result is less than 93%, otherwise the payment adjustment factor is 1.00.

\*\* Subject to removal and replacement at the discretion of the Owner's Representative.

.4 Air Void Content:

- .1 For full payment, the Lot Mean Air Voids must be within  $\pm 1.0\%$  of the JMF value.

- .2 Payment adjustment for air void content is as follows:

Air Void Content % Deviation from JMF Value	Payment Adjustment Factor (PA <sub>AV</sub> )
Less than 1.0	1.00
1.0 to 2.0	As per Chart C
Greater than 2.0 (Lower Lifts)	0.80
Greater than 2.0 (Upper Lifts)	0.60

- .5 Thickness (New Construction and Top Lift Only)

- .1 Pavement of any type found to be deficient in thickness by more than 13mm will be removed and replaced by pavement of specified thickness, at the Contractor's expense.
- .2 The Lot Mean Thickness for any Lot will be determined on the basis of the acceptance cores described in the Acceptance Testing Requirements. Core thickness will be determined in accordance with ASTM D 3549.
- .3 If the deficiency of any individual core exceeds 6%, additional cores may be extracted in the proximity to the location of the core of excessive deficiency, to identify the extremities of the pavement area subject to be removed and replaced. The Contractor will pay for such additional coring.
- .4 For full payment, the Lot Mean Thickness must be equal to, or greater than, the specified thickness.
- .5 Payment adjustment for thickness is as follows:

Average Thickness Compared to Specified Thickness	Payment Adjustment Factor (PA <sub>T</sub> ) *	
	Total Thickness (Single or Multiple Lifts)	Top Lift Thickness (Multiple Lifts)
Compliant or Greater	1.00	1.00
1mm to 13mm Deficient	As Per Chart D	As Per Chart D
More than 13mm Deficient	Reject **	Reject **

\* A single Thickness Payment Adjustment Factor shall be applied, Total Thickness or Top Lift Thickness, whichever results in the greatest adjustment.

\*\* Subject to removal and replacement at the discretion of the Owner's Representative.

- .6 Smoothness

- .1 The completed asphalt concrete surface will be true to the dimensional and tolerance requirements of the specifications and drawings. Unless detailed otherwise in the contract documents, the tolerances in both profile and crown are:
  - .1 Base Course - 10 mm in 3 m
  - .2 Surface Course - 5 mm in 3 m

- .2 When deviations in excess of the above tolerances are found, the pavement surface will be corrected by methods satisfactory to the Owner's Representative. Correction of defects will be carried out until there.

**.7 Segregation**

- .1 The finished surface will have a uniform texture and be free of segregated areas. A segregated area is defined as an area of the pavement where the texture differs visually from the texture of the surrounding pavement.

- .2 All segregation will be evaluated by the Owner's Representative to determine repair requirements.

- .3 The rated severity of segregation will be rated as follows:

- .1 Slight - The matrix of asphalt cement and fine aggregate is in place between the coarse aggregate particles, however there is more stone in comparison to the surrounding acceptable mix.
- .2 Moderate - Significantly more stone than the surrounding mix, and exhibit a lack of surrounding matrix.
- .3 Severe - Appears as an area of very stony mix, stone against stone, with very little or no matrix.

- .4 Segregated areas will be repaired by the Contractor as directed by the Owner's Representative. The following methods of repair are identified.

- .1 Slight - Squeegee asphalt to completely fill the surface voids.
- .2 Moderate - slurry seal for full mat width.
- .3 Severe - removal and replacement or overlay.

<b>Segregation Severity</b>	<b>Total Thickness (Single or Multiple Lifts)</b>	<b>Top Lift Thickness (Multiple Lifts)</b>
Slight	The matrix of asphalt cement and fine aggregate is in place between the coarse aggregate particles, however there is more stone in comparison to the surrounding acceptable mix.	Squeegee asphalt to completely fill the surface voids.
Moderate	Significantly more stone than the surrounding mix, and exhibit a lack of surrounding matrix.	slurry seal for full mat width.
Severe	Appears as an area of very stony mix, stone against stone, with very little or no matrix.	removal and replacement or overlay

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- .5 All repairs will be regular in shape and finished using good workmanship practices to provide an appearance suitable to the Owner's Representative.
- .6 Any other methods of repair proposed by the Contractor will be subject to the approval of the Owner's Representative.
- .7 Repairs will be carried out by the Contractor at their expense.

**3.13 PAYMENT ADJUSTMENT FOR NON-COMPLIANCE**

- .1 The Unit Price applicable to each Lot quantity of asphalt concrete will be calculated as follows:

$$\text{Adjusted Unit Bid Price} = (\text{Unit Bid Price}) \times (\text{PA}_{AC}) \times (\text{PA}_{COM}) \times (\text{PA}_{AV}) \times (\text{PA}_T)$$

Where:

$\text{PA}_{AC}$  = Asphalt Content Payment Adjustment

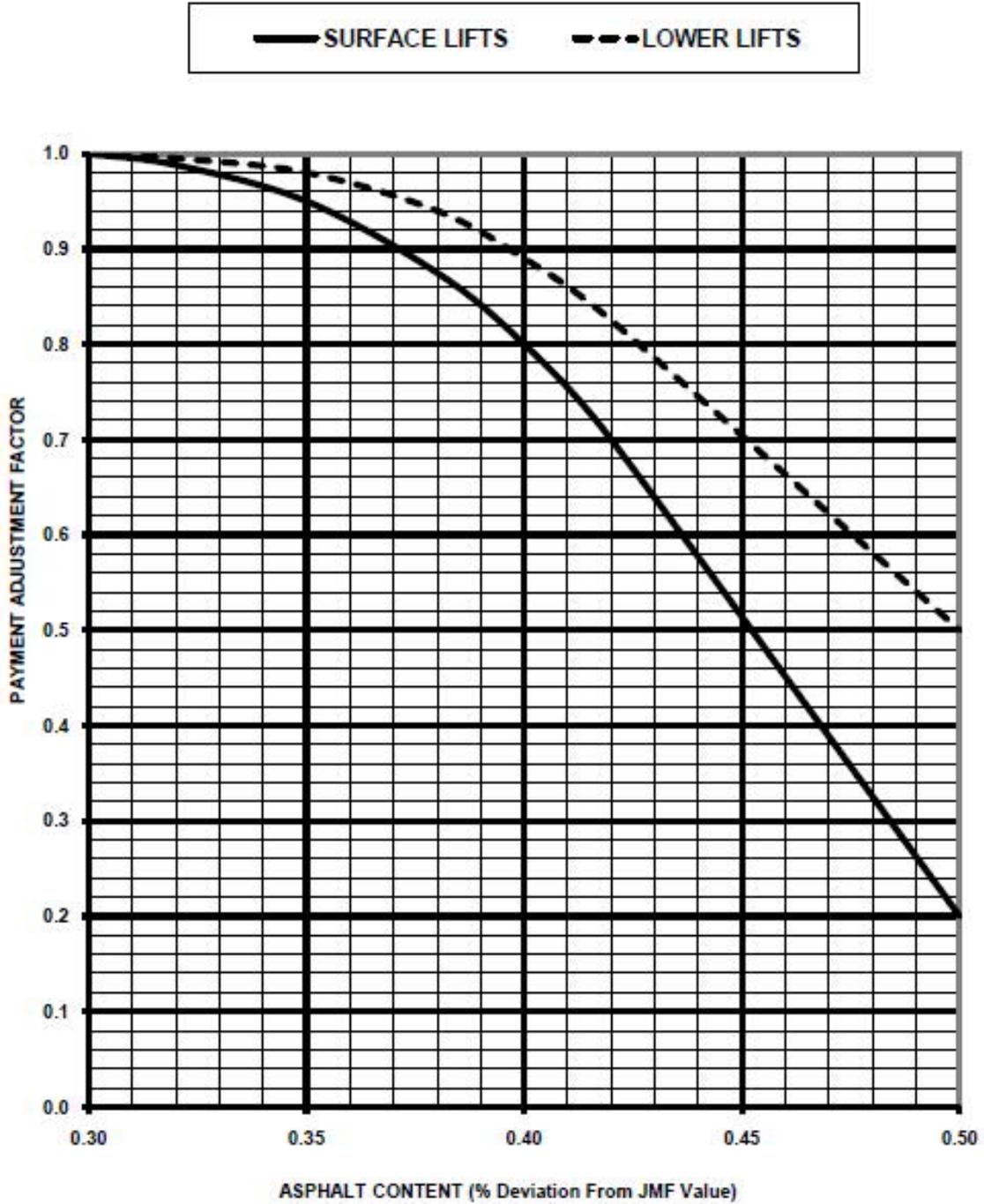
$\text{PA}_{COM}$  = Pavement Compaction Payment Adjustment

$\text{PA}_{AV}$  = Air Void Payment Adjustment

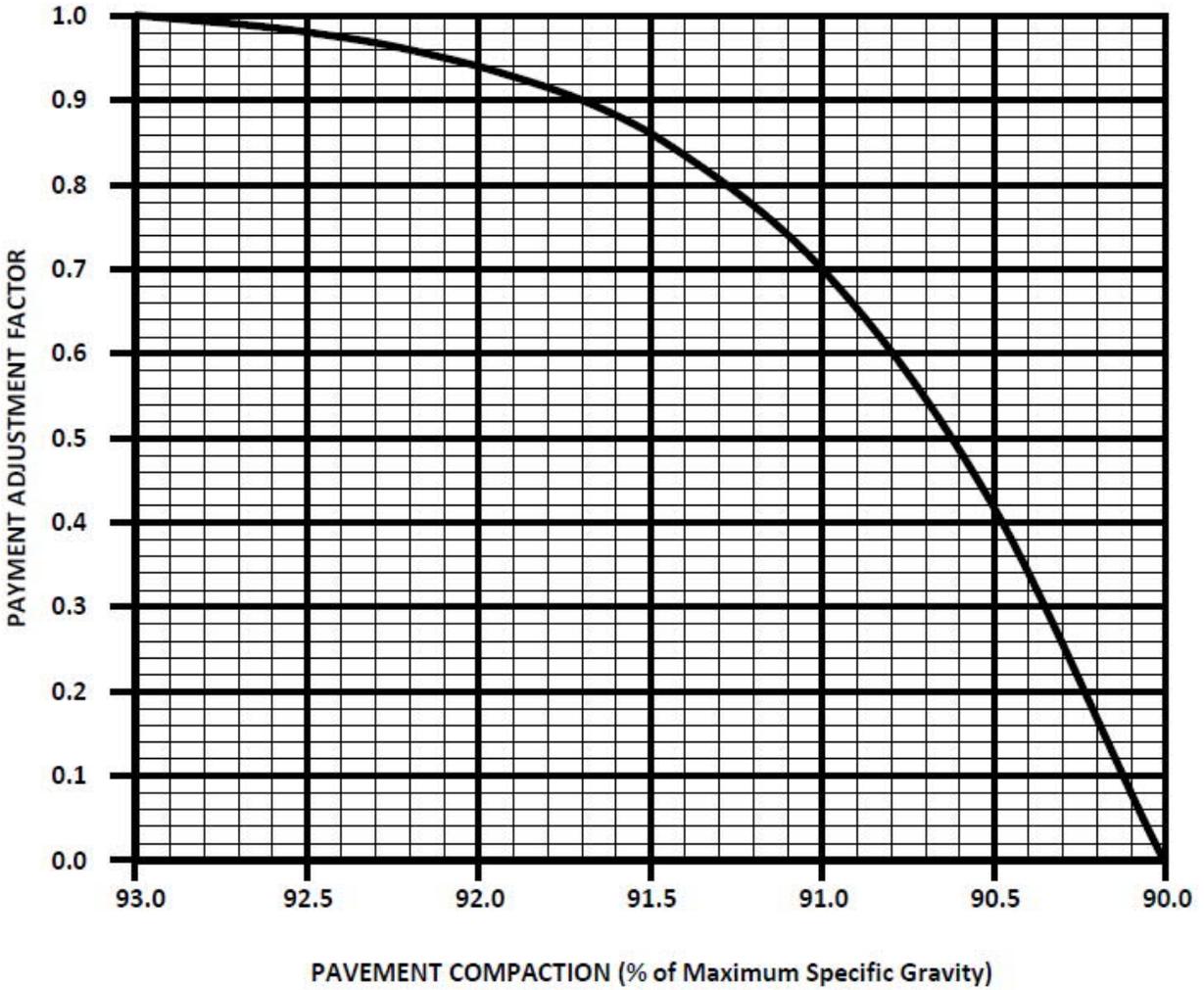
$\text{PA}_T$  = Thickness Payment Adjustment

**END OF SECTION**

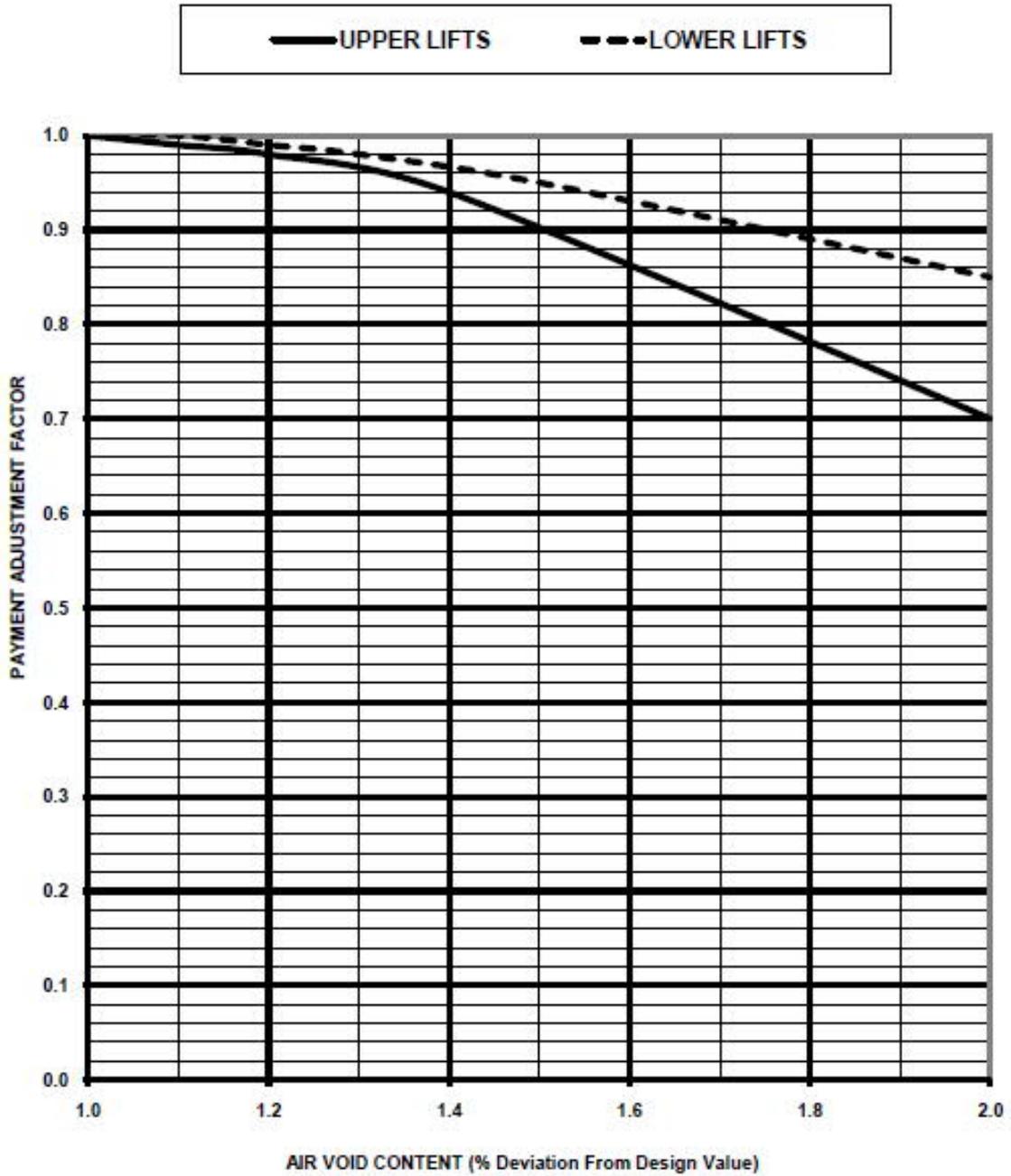
CHART A  
ASPHALT CONTENT  
PAYMENT ADJUSTMENT FACTOR (PA<sub>AC</sub>)



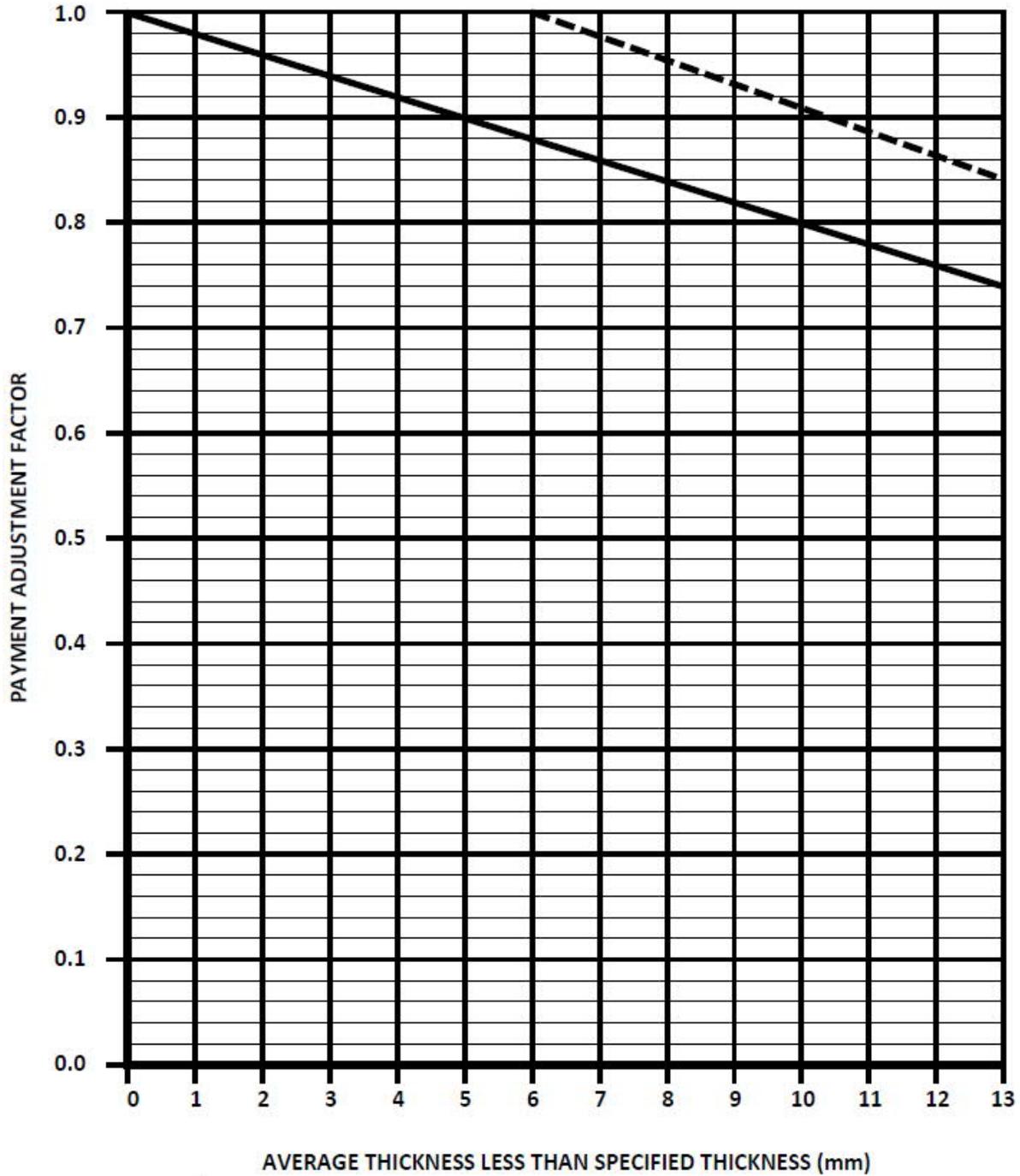
**CHART B**  
**COMPACTION**  
**PAYMENT ADJUSTMENT FACTOR (PA<sub>COM</sub>)**



**CHART C**  
**AIR VOID CONTENT**  
**PAYMENT ADJUSTMENT FACTOR (PA<sub>AV</sub>)**



**CHART D**  
**AVERAGE THICKNESS**  
**PAYMENT ADJUSTMENT FACTOR (PA<sub>T</sub>)**



Legend:  
Total Thickness      ———  
Top Lift Thickness    - - - - -

**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Asphalt Pavement Crack Routing and Sealing” specified herein.
- .2 The purpose of crack sealing is to prolong the life of existing pavements by preventing moisture from penetrating the roadway structure, and by preventing the spalling of material from the edges of the cracks.

**1.2 SUBMITTALS**

- .1 Submit product information on crack sealants, selected for the project works including: name and mailing address of crack sealant supplier and manufacturer, name of crack sealant product to be supplied and written confirmation from the manufacturer that the crack sealant to be supplied meets all specified requirements along with test results that demonstrate that the product meets all specified requirements.

**1.3 SAMPLING AND TESTING**

- .1 Quality control, including the provision of quality control test results for the crack sealant materials, is the responsibility of the Contractor.
- .2 Quality assurance testing may be conducted by the Owner’s representative. Testing will be completed in accordance with Alberta Transportation test methods (ATT): ATT-42, ATT-73 and ATT-56 Part III.

**2. PRODUCTS**

**2.1 CRACK SEALANT MATERIALS**

- .1 Cold-applied crack sealing materials will not be used for this Contract.
- .2 Hot-applied thermoplastic materials
  - Mineral-filled asphalt cement
  - Fiberized asphalt
  - Asphalt rubber
  - Rubberized asphalt
  - Low-modulus rubberized asphalt
- .3 Chemically cured thermosetting materials
  - Self-leveling silicone
- .4 All products to be in accordance with Alberta Transportation’s approved products list.

**2.2 BLOTTING AGENTS**

- .1 When approved the following blotting agents may be used:
- Screened sand with a maximum topsize of 2mm
  - Cement
  - flyash

**3. EXECUTION**

- .1 All Work shall be performed during daylight hours only. No Work shall be performed if the visibility is less than 700 metres. No Work shall be performed during rain or snow or when the pavement surface or cracks are wet. The maximum work area shall be 3 km in length.
- .2 The crack sealant shall not be applied when the pavement temperature is below 10° Celsius.
- .3 Unless otherwise noted, all transverse cracks between 2 mm and 25 mm in width and longitudinal cracks between 2 mm and 12 mm in width shall be routed and sealed. Cracks to be routed keeping the crack in the centre of the rout cross-section.
- .4 Prior to the application of crack sealant, the road surface adjacent to the cracks shall be cleaned and all loose material and moisture shall be removed from the routed cracks. All debris resulting from the cleaning and routing operation shall be removed from the road surface. The routed cracks shall be treated with the hot compressed air lance until the pavement in the routed crack is dry and slightly darkened. There shall be a maximum time period of 2 minutes between cleaning and drying the routed cracks and the application of the crack sealant.
- .5 Crack sealant shall be heated and applied within the applicable specified temperature ranges and in accordance with the manufacturer's recommendations. The heat transfer oil in the melting kettle shall not be heated in excess of 50° C above the safe heating temperature.
- .6 Routed cracks shall be filled with crack sealant such that upon cooling, the filled crack is as shown on the drawings. Excessive crack sealant shall be removed from the pavement surface immediately following application.
- .7 Traffic shall be kept off sealed cracks until the crack sealant has cured. At locations such as intersections where this is not practical, the Contractor shall prevent tracking by applying a blotting agent to the crack sealant. When a blotting agent is used, it shall not be applied until the sealant has cooled sufficiently to prevent inclusion of the blotting agent into the sealant.
- .8 Fuel, asphalt and any other spills shall be cleaned up to the satisfaction of the Consultant at the Contractor's expense.

**END OF SECTION**

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**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Asphalt Pavement Crack Mill and Fill” specified herein.

**2. PRODUCTS**

**2.1 GENERAL**

- .1 All materials are detailed in other sections fo the specification.

**2.2 EQUIPMENT**

- .1 A dry process cold milling machine capable of milling a trapezoidal shaped notch as shown on Drawings.
- .2 Milling machines using water to cool the milling head will not be permitted.
- .3 Sweeping and blowing equipment capable of removing all loosened material from the milled notch and off the roadway surface.

**3. EXECUTION**

- .1 No Work shall be performed during rain or snow or when the pavement surface or cracks are wet.
- .2 Mill a trapezoidal-shaped notch centered over the crack to the limits identified by the Owners Representative.
- .3 All loosened material shall be removed from the notch and the milled surfaces shall be left clean and dry. The milled material shall be disposed of.
- .4 Apply tack coat to all exposed pavement edges by means of hand spraying at the application rates specified in Section 02743.
- .5 The asphalt concrete pavement mix shall be placed and compacted to the top of the milled notch in lifts not greater than 50 mm thick to a minimum of 96% Marshall density, or as otherwise specified. Asphalt cores taken for density testing shall be taken from the center of the notch.
- .6 Backfill all milled notches the same day.

**4. ACCEPTANCE CRITERIA**

- .1 The Work shall comply with the following for final acceptance by the Owners Representative:

- all milled cracks conform with the specified milling profile;
  - the milling conforms to the path of the crack with no part of the crack outside or touching the edge of the milled cross-section;
  - all milled cracks are filled with the proper asphalt mix;
  - the asphalt mix is compacted to the required density;
  - the completed work provides a smooth transition between the infilled material and the adjacent undisturbed pavement surface; and
  - all milled material has been properly spread over the sideslope or disposed of and the work area left in a neat and tidy condition.
- .2 Treated cracks failing to meet these criteria will be repaired by the Contractor at his own expense.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this section in conjunction with other sections for location, use and placement of “Pavement Markings” specified herein.

**1.2 REFERENCES**

- .1 Pavement markings to be in accordance with the latest edition of the “Aerodrome Standards and Recommended Practices”, by Transport Canada (TC).
- .2 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner
- .3 CGSB 1-GP-12C, Standard Paint Colors
- .4 CGSB 1-GP-71, Method of Testing Paints and Pigments
- .5 CGSB 1-GP-74M, Paint, Traffic, Alkyd

**2. PRODUCTS**

**2.1 MATERIALS**

- .1 Paint: CGSB 1-G-12C, yellow 505-308, black 512-301, white 513-301
- .2 Thinner: CAN/CGSB-1.5
- .3 Glass beads: Overlay type: CGSB 1-GP-1-149A

**2.2 MATERIALS REPORTING**

- .1 Contractor to furnish certified test reports for the materials shipped to project. The report shall not be a basis for final acceptance. Contractor to notify the Owners Representative upon arrival of paint to the work site. All emptied containers to be returned to a paint storage area for checking by the Owners Representative. Emptied containers are not to be removed or destroyed until approved by the Owners Representative. Contractor is responsible for disposing all containers in accordance with all applicable laws and regulations.

**3. EXECUTION**

**3.1 EQUIPMENT REQUIREMENTS**

- .1 All equipment for use in the work shall be approved by the Owners Representative and shall include a mechanical marking machine and such auxiliary hand painting equipment as may be necessary to complete the work.
- .2 The mechanical marker shall be an approved atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at

the required coverage and shall be designed so as to apply markings of uniform cross sections and clear cut edges without running or splattering.

- .3 Suitable adjustments shall be provided on the sprayers of a single machine or by furnishing additional equipment for painting the width required.

### **3.2 CONDITION OF SURFACES**

- .1 Pavement surface must be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.
- .2 Complete any surface preparation requirements recommended by the paint manufacturer.

### **3.3 APPLICATION**

- .1 Owner's Representative to review Contractor pavement markings layout prior to paint application. Contractor to co-ordinate the review.
- .2 Unless otherwise approved by Owners Representative, apply paint only when air temperature is above 10°C, wind speed is less than 60km/h, and no rain is forecast within the next four (4) hours.
- .3 All paint lines and pavement marking require two separate coats of paint.
- .4 Apply traffic paint evenly at rate of not less than 0.37 L/m<sup>2</sup>.
- .5 Do not thin paint unless approved by Owner's Representative.
- .6 Symbols and letters to conform to dimensions indicated.
- .7 Paint lines to be of uniform color and density with sharp edges.
- .8 Thoroughly clean distributor tank before refilling with paint of different color.
- .9 Apply glass beads at a rate of 650 g/L of painted area immediately after application of paint.
- .10 Protect pavement markings until dry.
- .11 Protect adjacent structures, buildings, sidewalks, landscaping and other surface features against spillage and over-spray during painting operations.

### **3.4 CLEAN UP**

- .1 Remove spillage and over-spray of paint from pavement and other surface features. Use methods and materials without damaging and leaving visible residue on substrates.

### **3.5 TOLERANCE**

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- .1 Paint markings to be within – 10 mm and + 10 mm of dimensions indicated. There shall be no overlap between the second and first coat. Both coats of paint shall be the same width and alignment.
- .2 Remove incorrect markings as requested by the Owners Representative.

**END OF SECTION**

**1. GENERAL**

**1.1 INTENT**

- .1 Read this section in conjunction with other sections for location, use and placement of “Hydro Seeding” specified herein.

**Error! Bookmark not defined.**

**1.2 DELIVERY STORAGE AND HANDLING**

- .1 Provide seed in standard containers clearly labelled with the following information:
- .1 Supplier’s name and address
  - .2 Lot Number
  - .3 Net Mass
  - .4 Names and percentages of individual seed species
- .2 Protect seed from moisture, mould and damage while in transit and storage.
- .3 Provide fertilizer in standard containers clearly labelled with the following information:
- .1 Supplier’s name and address
  - .2 Specified Composition
  - .3 Net Mass

**2. PRODUCTS**

**2.1 MATERIALS**

- .1 Seed Mixture composition:
- |    |                     |               |
|----|---------------------|---------------|
| .2 | Creeping Red Fescue | 53% by weight |
| .3 | Western Wheatgrass  | 33% by weight |
| .4 | Kentucky Bluegrass  | 14% by weight |
- .2 Provide Canada No. 1 Grade Seed in accordance with the Government of Canada Seeds Act and Seeds Regulations. Seeds which are wet, mouldy, or otherwise damaged will be rejected.
- .3 Provide seeds and seed mixtures that are free of all prohibited weed seeds.
- .4 Provide water free of any impurities which would inhibit or adversely affect germination and growth.
- .5 Provide fertilizer in accordance with the Government of Canada Fertilizers Act and Fertilizers Regulations. Fertilizer composition: 16-20-0. Fertilizer is to be compatible with the seed mixture and soil used. Minimum application rate is 150 kg/hectare.

- .6 Provide wood or wood cellulose fibre, which is free of growth and germination inhibiting factors or other deleterious matter. Minimum application rate is 1500 kg/hectare.
- .7 Provide a polymer of resin tackifier, for use with wood fibre mulch. Application rate as recommended by manufacturer.
- .8 Provide hydraulic seeding equipment including slurry tank, agitation system, pumps, hoses and nozzles.

### **3. EXECUTION**

#### **3.1 GENERAL**

- .1 Prepare topsoil surfaces for seeding as specified in Section 02201. Employ surface roughening methods to minimize erosion and promote grass catch.
- .2 Apply hydro seeding in accordance with the Contract Drawings and as defined in the specifications.
- .3 Apply materials during calm weather and on ground free of frost and standing water.
- .4 Measure the quantities of materials by weight.

#### **3.2 APPLICATION OF SEEDS**

- .1 Perform hydro seeding operations at such a time of the year when climatic conditions are suitable for establishing grass stands.
- .2 Fine grade and loosen the surface to plow depth to obtain a proper seed bed without undue loss from high winds or ordinary rainfall.
- .3 Add materials, using the proper sequence, into the hydraulic seeder under agitation to produce a thoroughly mixed slurry.
- .4 Apply slurry uniformly, at the optimum angle for adherence to surfaces and germination of seed.
- .5 Where the work adjoins existing vegetation, blend the slurry application at least 300mm into adjacent vegetated areas.
- .6 Protect seeded areas against damage.

#### **3.3 MAINTENANCE**

- .1 Maintain optimum soil moisture level in seeded area for germination and continued growth. Control watering to prevent displacement or erosion.

- .2 Re-apply seed, fertilizer, mulch and tackifier to all areas that do not show a uniform stand of grass. Perform such reapplication to allow for establishment prior to Substantial Performance of the Work. A uniform stand of grass will be considered growth that shows no bare spots greater than 0.25 square metres in size and provides a minimum of eighty percent ground cover.

**END OF SECTION**

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**1. GENERAL**

**1.1 INTENT**

- .1 Read this Section in conjunction with other Sections for location, use and placement of “Restoration of Sitework” specified herein.

**2. PRODUCTS**

- .1 Not Applicable.

**3. EXECUTION**

**3.1 RESTORATION - GENERAL**

- .1 Restore all existing areas and sitework damaged or disturbed due to earthwork or other work of this Contract, back to their original condition or better.

**3.2 LANDSCAPE WORK**

- .1 Protect the integrity of the existing landscape features by implementing construction procedures that will minimize damages.
- .2 Restore all landscape features damaged or disturbed by the work, back to their original condition or better. All costs associated with this work will be borne by the Contractor.
- .3 All grassed areas will be restored with topsoil and dryland hydro seed mixture.
- .4 Topsoil and sod reconstruction limits will be laid out by the Owner’s Representative when rough grading has been completed.
- .5 All landscape work will be completed to the satisfaction to the Owner.

**3.3 ASPHALT WORK**

- .1 Protect the integrity of existing runway. This includes utilizing suitably sized equipment and implementing construction procedures that will minimize pavement and structural damage.
- .2 Replace any asphalt pavement damaged or disturbed, outside of the construction limits. All costs associated with this work will be borne by the Contractor.

**3.4 GRAVEL WORK**

- .1 Restore any gravel damaged or disturbed outside of the construction limits, back to their original condition or better. All costs associated with this work will be borne by the Contractor.

**END OF SECTION**

**1. REGULATORY REQUIREMENTS**

- .1 Comply with Safety Codes Act and rules and regulations made pursuant thereto, including the Canadian Electrical Code.
- .2 Unless otherwise indicated, all references to "Canadian Electrical Code" or "CEC" shall mean the edition of the Canadian Electrical Code, Part I, CSA C22.1, and the variations made thereto by Alberta regulation, which are in force on the date of bid closing for the Contract.
- .3 All electrical products shall be tested, certified and labelled in accordance with a certification program accredited by the Standards Council of Canada. Where a product is not so labelled, provide written approval by the authority having jurisdiction.
- .4 Submit to authority having jurisdiction and Utility Company, necessary number of drawings and specifications for examination and approval prior to commencement of electrical work. Pay associated fees.
- .5 Submit to Owner, copy of electrical permit obtained from authority having jurisdiction.
- .6 If authority having jurisdiction conducts an electrical inspection, submit copy of certificate of acceptance provided by authority having jurisdiction.

**2. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

- .1 Submit shop drawings, product data and samples, as specified, indicating details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment and materials.

**3. OPERATION AND MAINTENANCE DATA**

- .1 Provide the following for all systems and components:
  - .1 Manufacturer's product data, including performance curves and schematic and wiring diagrams for all electrical control systems.
  - .2 Manufacturer's installation instructions.
  - .3 Manufacturer's operation instructions.
  - .4 Manufacturer's maintenance instructions, including complete parts list for all serviceable components.
- .2 Provide a comprehensive list of Subcontractors, Sub-subcontractors and suppliers who supplied and installed systems and components.
- .3 Provide copies of all inspection certification reports from authorities having jurisdiction.

**4. RECORD DRAWINGS**

- .1 Record actual locations of all pull boxes, panel boards, luminaires, feeders, electrical equipment and electrical site services.
- .2 Record any changes to circuit designations.

**5. COORDINATION**

- .1 Coordinate work specified with Operations.

**6. SOURCE OF SUPPLY**

- .1 All like materials shall be by a single manufacturer.

**7. REFERENCE STANDARDS**

- .1 Comply with standards of following organizations:
  - .1 Electrical and Electronic Equipment Manufacturers Association of Canada (EEMAC).
  - .2 Institute of Electrical and Electronic Engineers (IEEE).

**8. PRODUCT OPTIONS AND SUBSTITUTIONS**

- .1 Not applicable.

**9. TESTING**

- .1 Prior to energizing any portion of the electrical system, perform megger tests on all parts of the distribution system. Results shall meet the requirements of the CEC, authority having jurisdiction and the Contract Documents.

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED SECTIONS**

- .1 Not Applicable.

**2. PRODUCTS**

**2.1 IDENTIFICATION MATERIALS**

- .1 Lamacoid Nameplates: 3 mm thick plastic engraving sheet, black face, white core, mechanically attached, sizes as follows:
  - .1 Size 1: 12 mm high with 5 mm high letters.
  - .2 Size 2: 20 mm high with 8 mm high letters.
  - .3 Size 3: 25 mm high with 12 mm high letters.
- .2 Wire Identification Materials: Use one of the following:
  - .1 Heat shrink sleeves, blank.
- .3 Colour Banding Tape: Adhesive backed plastic tape, integrally coloured.

**3. EXECUTION**

**3.1 COLOUR IDENTIFICATION OF EQUIPMENT**

- .1 Electrical equipment shall be prefinished in coded colours designating voltage or system, as indicated in Equipment Identification Schedule.
- .2 Voltage colour identification for line voltage equipment shall be as follows:

	<b>Voltage</b>	<b>Colour</b>
.1	120/208 V or 120/240 V:	Grey
.2	347/600 V:	Grey
- .3 In addition to colour identification of line voltage equipment as stated in items 1&2, line voltage equipment with voltage greater than 300 Volts (line to line) shall be identified via clearly visible lamacoid (size 3).

**3.2 NAMEPLATE IDENTIFICATION OF EQUIPMENT**

- .1 Identify equipment with lamacoid nameplates, as indicated in Equipment Identification Schedule.

**3.3 WIRE IDENTIFICATION**

- .1 Power wiring from electrical panels to be labeled with panel identification and circuit number (eg: PNL A1 CCT 7).

- .2 Control wiring to be labeled with terminal labels as shown on PLC wiring diagrams (eg: F301, 301C, F1203, 1203, F144, 144N, F152, 152R)

**3.4 PANELBOARD DIRECTORIES**

- .1 Identify loads controlled by each overcurrent protective device in each panelboard, by means of a typewritten panelboard directory.

**3.5 COLOUR IDENTIFICATION OF WIRING**

- .1 Identify No. 2 AWG wiring and smaller by continuous insulation colour.
- .2 Identify wiring larger than No. 2 AWG by continuous insulation colour or by colour banding tape applied at each end and at splices.
- .3 Colour coding shall be in accordance with Canadian Electrical Code, and as follows:

	<b>Voltage</b>	<b>Colour</b>
.1	120/208 V, 3 phase:	Red, black and blue.
.2	120/208 V emergency:	Red, black and blue with yellow tracer.
.3	347/600 V 3 phase:	Orange, brown, and yellow
.4	347/600 V emergency:	Orange, brown, and yellow with red tracer

- .4 Where multi-conductor cables are used, use same colour coding system for identification of wiring throughout each system.
- .5 Maintain phase sequence and colour coding throughout each system.

**3.6 EQUIPMENT IDENTIFICATION SCHEDULE**

	<b>Equipment</b>	<b>Size</b>
.1	MCC's	3
.2	All compartments on MCCs	2
.3	LBTs	1
.4	HOA switches for exhaust fans	1
.5	Thermostats and Dehumidstats	1
.6	All instruments and equipment smaller than 300 mm × 300 mm × 300 mm, listed in Section 13312 and P&I drawings	1
.7	All instruments and equipment greater than 300 mm × 300 mm × 300 mm, listed in Section 13312 and P&I drawings	2
.8	All HVAC equipment	3
.9	All Electrical Panels	2
.10	Junction Boxes over 100 mm × 100 mm	1

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED SECTIONS**

- .1 Basic Electrical Requirements: Section 16005.
- .2 Colour coding and identification of wires: Section 16075.

**2. PRODUCTS**

**2.1 BUILDING WIRING**

- .1 Building Wiring: to CSA C22.2 No. 75-M1983 and as follows:
  - .1 Conductors: solid copper for No. 14 AWG and smaller, stranded copper for No. 12 AWG and larger.
  - .2 Insulation: RW90 X-link.
  - .3 Insulation Rating: 600V.

**2.2 CABLES**

- .1 Type TECK 90 Cable: to CSA C22.2 No. 131-M89 and as follows:
  - .1 Conductor: copper.
  - .2 Insulation: cross linked polyethylene (XLP).
  - .3 Rating: 600V.
  - .4 Size: as indicated.
  - .5 Configuration: as indicated.
  - .6 Inner Jacket: PVC -40°C.
  - .7 Armour: aluminum
  - .8 Outer Jacket: PVC -40°C.
- .2 Control Cable for Class 2 Remote Control and Signal Circuits:
  - .1 Conductor: copper.
  - .2 Insulation: 300 V insulation, rated 60°C.
  - .3 Configuration: individual conductors twisted together, shielded, and covered with a PVC jacket.

**2.3 CONNECTORS**

- .1 Provide factory fabricated, metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated.

**3. EXECUTION**

**3.1 WIRING, GENERAL**

- .1 Splice only in junction or outlet boxes.

- .2 Conductor length for parallel circuits shall be identical.
- .3 Neatly train and lace conductors inside cabinets, equipment and panelboards.

**3.2 WIRING INSTALLATION IN RACEWAYS**

- .1 Swab raceway system before installing wiring.
- .2 Use pulling lubricant for conductors No. 4 AWG and larger.

**3.3 WIRE CONNECTIONS AND TERMINATIONS**

- .1 Use solderless pressure connectors with insulated covers for copper wire splices and taps, No. 8 AWG and smaller.
- .2 Use insulated spring wire connectors with plastic caps for conductors No. 10 AWG and smaller.
- .3 Use split bolt connectors for copper wire splices and taps, No. 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150% of insulation value of conductor.

**3.4 WIRE SIZE SCHEDULE**

- .1 Lighting Circuits: No. 12 AWG minimum.
- .2 Power Circuits: No. 12 AWG minimum.
- .3 Motor Circuits: No. 12 AWG minimum, except as otherwise indicated on drawings or in schedules.
- .4 Feeder Circuits: as indicated on drawings.

**END OF SECTION**

**1. GENERAL**

**1.1 RELATED SECTIONS**

- |    |                                |                |
|----|--------------------------------|----------------|
| .1 | Basic Electrical Requirements: | Section 16005. |
| .2 | Electrical Identification:     | Section 16075. |
| .3 | Wire and Cable:                | Section 16121. |

**1.2 COORDINATION**

- .1 Coordinate with other work including wire and cable, boxes and fittings and panel work, as necessary to interface installation of conduit with other work.

**2. PRODUCTS**

**2.1 CONDUIT, GENERAL**

- .1 Except where otherwise required by Canadian Electrical Code (CEC), provide conduit of types specified in Conduit Installation Schedule and sizes indicated on drawings or specified.
- .2 Where sizes are not indicated, select proper sizes to suit intended use, fulfill wiring requirements, and comply with Canadian Electrical Code (CEC).

**2.2 METAL CONDUIT AND TUBING**

- .1 Rigid Metal Conduit: to CSA C22.2 No. 45-M1981, and as follows:
- .1 Galvanized Rigid Steel Conduit: zinc coated steel.
  - .2 Fittings: same material as conduit.
- .2 Flexible Metal Conduit: to CSA C22.2 No. 56-1977, and as follows:
- .1 Liquid-Tight Flexible Metal Conduit: continuous interlocked and double-wrapped steel, zinc coated inside and outside, coated with liquid-tight jacket of flexible PVC, minimum 12 mm diameter.
  - .2 Liquid-Tight Flexible Metal Conduit Fittings: cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings.
- .3 Miscellaneous Fittings: locknuts, bushings, reducers, chase nipples, 3 piece unions, split couplings, plugs, and expansion fittings specifically designed for their particular application.

**2.3 NON-METALLIC CONDUIT**

- .1 Rigid PVC (Unplasticized) Conduit: to CSA C22.2 No. 211.2-M1984.

**3. EXECUTION**

**3.1 INSTALLATION OF CONDUIT, GENERAL**

- .1 For existing buildings and new pre-fabricated buildings, conduit shall be surface mounted on walls and ceilings.
- .2 For new buildings with masonry external walls, conduit can be surface mounted to the interior of the wall. For internal studded walls, conduit is to be concealed in the wall.
- .3 Conduit on the outer exterior walls is to be avoided and minimized where necessary.
- .4 Conduit system shall be weatherproof for outdoor areas and for indoor areas with process piping.
- .5 EMT with raintight fittings will be allowed where it is not subject to mechanical injury such as along walls and above 1200 mm from walkway surface. Where a conduit may be stepped on or bumped during typical operation and maintenance, rigid metal conduit shall be used.
- .6 Conduit shall be rigid pipe with proper support except for final connection to field instruments. The final 500 mm conduit connection into field instruments and equipment shall be liquid tight flexible metal. This is to allow easy disconnection and replacement of the device when required.
- .7 Plug conduit ends to prevent entry of dirt and moisture.
- .8 Seal conduit with duct seal compound or fiberglass where conduit leaves heated area and enters unheated area.
- .9 Provide necessary flashing and pitchpockets, making watertight joints where conduit passes through roof or waterproofing membranes.
- .10 Where conduit crosses building expansion joints, install expansion fitting approved by authority having jurisdiction, complete with grounding jumper. Provide bend or offset in conduit adjacent to building expansion joint where conduit is installed above suspended ceilings.

**3.2 INSTALLATION OF RIGID METAL CONDUIT**

- .1 Cut conduit straight, properly ream, cut threads and brush threads clean.
- .2 Fasten conduit terminations in sheet metal enclosures with two locknuts and terminate with bushing. Install locknuts inside and outside enclosure.
- .3 Conduit installed underground shall be painted with two coats of corrosion inhibiting compound before backfilling.

**3.3 INSTALLATION OF NON-METALLIC CONDUIT**

- .1 Make field bends and solvent cemented joints in accordance with manufacturer's instructions.

**3.4           INSTALLATION OF EXPOSED AND SEMI-CONCEALED CONDUIT**

- .1   Comply with the following when installing conduit exposed in service areas, unfinished areas, finished areas, and in accessible spaces behind ceilings, walls and floors:
  - .1   Install conduit to conserve headroom and cause minimum interference in spaces through which conduit passes.
  - .2   Install conduit so as not to interfere with ceiling inserts, luminaires or ventilation ducts or outlets.
  - .3   Alter routing to avoid structural obstructions, keeping crossovers to a minimum.
  - .4   Install exposed conduit and extensions from concealed conduit systems neatly, parallel with, or at right angles to walls and structural members.
  - .5   Run conduit for outlets on waterproof walls exposed. Set anchors for supporting conduit on waterproof wall in waterproof cement.

**END OF SECTION**



***Engineering Ltd.***