TENDER DOCUMENTS

FOR

TOWN OF DRUMHELLER

DRUMHELLER RESILIENCY AND FLOOD MITIGATION MIDLAND DIKE UPGRADES PROJECT TENDER NO. 22.06.20A

DRUMHELLER VALLEY

Klohn Crippen Berger

Klohn Crippen Berger Ltd. Project No: A03409A05

JUNE 2022

Contents

1 INSTRUCTIONS TO PROPONENTS

1.1 *PREPARATION OF TENDERS*

The Tender must be submitted on the forms provided. Each Proponent shall specify on the Tender Form the unit price for each of the separate items called for.

The Proponent shall sign his or her Tender correctly in ink and his or her post office address must be shown.

1.2 *DELIVERY OF TENDERS*

Proponents must submit the section entitled **"Tender Forms,"** in addition to **all Addenda** as issued by the Issuing Office.

Proponents must submit the section entitled "Tender Forms", in addition to all addenda as issued by the Consultant, by email to:

Drumheller Resiliency and Flood Mitigation Office

purchasing@drumheller.ca

Proponents are advised that The Owner accepts no responsibility for submission delays for any reason whatsoever and submissions received after the closing time will be rejected.

Submissions shall include the Subject:

Midland Dike Upgrades Project, TENDER NO. 22.06.20A, [Contractor Name]

Submission will be received until: **2:01 pm, Local Time, July 12, 2022**

Tenders must be received before the bid closing date and time. The official time of receipt shall be determined by the time and date stamp of the Submission Email Address system.

The Bidder is solely responsible for ensuring their tender submission is received in its entirety prior to the tender Closing Time and is encouraged to submit their tender in advance of the tender Closing Time. The Owner assumes no responsibility for server availability or any technical problem, issue, or delay that prevents the submission from being received by the tender Closing Time.

Tenders will be opened after the stated Closing Time and all bidders are invited to view the opening virtually. Details on the process to connect to the opening will be provided to bidders at the pre-tender meeting. The legal name of each bidder and the total tender as stated in the unit price schedule will be read aloud. This reading will not be considered as a representation or warranty that the price is correct or that the tender document is valid.

Bidders shall retain the original copy of all tender documents submitted electronically. The successful bidder will be required to provide their original tender documents, including applicable authentication and original bonds, to the Owner prior to contract execution.

TENDER SUBMISSION

1.2.1 GENERAL

This Tender Document states the instructions for submitting Tenders and the procedures and criteria by which Proponents will be selected. Please acknowledge receipt of this tender document by emailing the Receipt Confirmation form only to the Issuing Office. A copy of the Vendor Participation – Receipt Confirmation Form is included in **Section 2 Tender Forms.**

The Town of Drumheller (herein referred to as "The Owner") reserves the right to reject any or all Tenders, in the event that the Tenders do not meet the requirements. All costs incurred by Proponents in responding to this tender document are solely to the Proponent's account. Under no circumstances, including the cancellation of this tender and/or the decision not to proceed with the tendering process, will The Owner be liable for any costs incurred by the interested Proponents. Furthermore, in no way will this document suggest or constitute a contractual arrangement between the Proponents and The Owner.

The Proponent's Tender and all supporting information become the property of The Owner. All such documentation may be reproduced by The Owner, provided that such reproduction is made solely for internal use or for any purpose required by law.

1.2.2 FORMAT OF TENDER SUBMISSION

1.2.2.1 The tender shall include all pages entitled "Tender Forms" and any attachments thereto in **one** single e-mail with a maximum email size of 25MB.

1.2.2.2 If submissions are larger than 25MB, an email submission with a link to a cloud-basedfile sharing account is acceptable. It is the responsibility of the Bidder to ensure the client can access all files at the time of the deadline, as posted on the cover page.The client will then download all files and documents immediately after the deadline.

1.2.2.3 The email shall include the Tender Number and Bidder Name in the subject title of the email submission.

1.2.2.4 The tender shall be signed and sent in an unprotected Portable Document Format (PDF).

1.2.2.5 The tender shall be accompanied by a bid bond in a digital format as outlined in Section 1.10.

1.2.2.6 All files included in the tender submission shall be in file formats that can be opened by Adobe Acrobat Reader unless otherwise instructed in the tender documents. TheOwner will not accept compressed files (i.e. .zip, .7z).

1.2.2.7 All Tender Forms submitted shall be as issued by the Owner without any additions, alterations, or changes, other than the addition of information requested. Any required information that is missing, omitted, or illegible, any alterations to the text orany

conditions added on or submitted with the Tender Forms, may cause the tender to be declared invalid and rejected.

1.2.3 CONDITIONS OF TENDER

1.2.3.1 All communications regarding this Tender shall be sent to the Issuing Office (Drumheller Resiliency and Flood Mitigation Office) or Authorized Representative. The Owner will assume no responsibility for oral instructions or suggestions. Should the Proponent find discrepancies in or omissions from the specifications, or should the Proponent be in doubt as to their meaning, the Proponent shall notify the Issuing Office or Authorized Representative who may, if necessary, send written addenda to all Proponents.

1.2.3.2 Proponents are advised that all the instructions to Proponents and General Conditions of Tender as may be supplemented herewith, must be strictly complied with. Failure to do so either in whole or in part may invalidate the Tender submitted.

1.2.3.3 Tenders shall be properly executed in full compliance with the following:

- Tenders must be signed by the representative for the Proponent;
- if the Tender is made by a corporation, the full name of the corporation shall be accurately printed immediately above the signatures of its duly authorized officers and the corporate seal shall be affixed;
- if the Tender is made by a partnership, the firm name or business name shall be accurately printed above the signature of the firm and the Tender shall be signed by a partner or partners who have authority to sign for the partnership;
- if the Tender is made by an individual carrying on business under a name other than his or her own, his or her business name together with the individual's name shall be printed immediately above its signature; and
- if the Tender is made by a sole proprietor who carries on business in his or her own name, the proprietor shall print his or her name immediately below his or her signature.

1.2.3.4 In accordance with approved policy of The Owner, each Proponent shall, as a condition of supplying goods and services to The Owner, make full disclosure of any of the following existing business relationships with any member of Council, Directors, or Town of Drumheller, Chief Administrative Officer:

- If a private company - Details of ownership of shares by any of the above.
- If a public company - Details of any ownership of shares, in excess of 1% of total shares issued by any of the above.
- If a partnership - Details of any partnership arrangement of any of the above.
- Details of any directorship of any of the above, unless the directorship is only by reason of the individual being a member of Council, and who has Council's authorization to vote.
- Details of any direct or indirect pecuniary interest of any of the above in the supply of such goods and services.

1.2.3.5 Disclosure, if any, of an existing business relationship shall be made in writing at the time of Tender submission or at the time the Proponent become, or ought to have become, aware of any such relationship.

1.2.3.6 Each Proponent shall make full disclosure of any relationship of any employee of Town of Drumheller who makes recommendations concerning the award of the Tender or any employee who may allot work to or order supplies from the awarded Tender. In addition, Proponents are to reveal details of ownership or partnership arrangements of any immediate relative employed by The Owner who alone or with other relatives hold more than a 25% interest. Failure to disclose this information may result in the rejection of the Tender and/or cancellation of the award. The Owner will not be liable for any costs incurred by the Proponent due to cancellation of the award.

1.2.3.7 The law applicable to this Tender shall be the law in effect in the Province of Alberta. Except for an appeal from an Alberta Court to the Supreme Court of Canada, no action in respect to this Tender shall be brought or maintained in any Court other than in a court of the appropriate jurisdiction of the Province of Alberta.

1.2.4 OTHER GENERAL CONDITIONS APPLICABLE TO THIS TENDER

1.2.4.1 Appendices and Addenda

Any appendices to this tender document and any subsequent addenda are incorporated into and form part of this tender. The information and data contained in any appendices and any subsequent addenda may form the basis upon which the Contract will be entered into with The Owner.

1.2.4.2 Disclaimer of Liability and Indemnity

By submitting a Tender, a Proponent agrees:

- to be responsible for conducting its own due diligence on data and information upon which its Tender is based;
- that it has fully satisfied itself as to its rights and the nature extended to the risks it will be assuming;
- that it has gathered all information necessary to perform all of its obligations under its Tender;
- that it is solely responsible for ensuring that it has all information necessary to prepare its Tender and for independently verifying and informing itself with respect to any terms or conditions that may affect its Tender;
- to hold harmless The Owner, its elected officials, officers, employees, agents or advisors, and all of their respective successors and assigns, from all claims, liability, and costs related to all aspects of the tender process;
- that it shall not be entitled to claim against the The Owner, its elected officials, officers, employees, insurers, agents, or advisors on grounds that any information, whether obtained from The Owner or otherwise (including information made available by its elected officials, officers, employees, agents or advisors), regardless of the manner or form in which the information is provided is incorrect or insufficient;

- that The Owner will not be responsible for any costs, expenses, losses, damages, or liability incurred by the Proponent as a result of, or arising out of, preparing, submitting, or disseminating a Tender, or for any presentations or interviews related to the Tender, or due to The Owner's acceptance or non-acceptance of a Tender; and
- to waive any right to contest in any proceeding, case, action, or application, the right of The Owner to negotiate with any Proponent for the Contract whom The Owner deems, in its sole and unfettered discretion, to have submitted the Tender most beneficial to The Owner and acknowledges that The Owner may negotiate and contract with any Proponent it desires.

1.2.5 REPRESENTATIONS AND WARRANTIES

The Owner makes no representations or warranties other than those expressly contained herein as to the accuracy and/or completeness of the information provided in this tender document.

Proponents are hereby required to satisfy themselves as to the accuracy and/or completeness of the information provided in this tender.

No implied obligation of any kind by, or on behalf of, The Owner shall arise from anything contained in this tender, and the express representations and warranties contained in this tender, and made by The Owner, are and shall be the only representations and warranties that apply.

Information referenced in this tender, or otherwise made available by The Owner or any of its elected officials, officers, employees, agents, or advisors as part of the procurement process, is provided for the convenience of the Proponent only and none of The Owner, its elected officials, officers, employees, agents, and advisors warrant the accuracy or completeness of this information. The Proponent is required to immediately bring forth to The Owner any conflict or error that it may find in the tender document. All other data is provided for informational purposes only.

1.3 *ACCEPTABILITY OF TENDERS*

The Proponent will be allowed to withdraw and modify his or her Tender up to **thirty (30) minutes** before the tender closing time. The modified Tender must be resubmitted in accordance with the instructions contained in **Section 1.2 Delivery of Tenders**, even if the amendment is of unit prices only.

Tenders that are unsigned, incomplete, conditional, illegible, unbalanced, obscure, or contain additions not called for, reservations, erasures, alterations, or irregularities of any kind, may be rejected as unacceptable and rejected.

The Proponent shall fill in every item on the Tender Form. Where quantities are not given, unit prices shall only be entered.

If there is a discrepancy found between the unit prices and the total amount, the unit price will be considered as representing the intention of the Proponent.

The lowest or any Tender will not necessarily be accepted.

1.4 TOWN OF DRUMHELLER AUTHORIZED REPRESENTATIVES - PROJECT ENQUIRIES

The only persons who are, or shall be, authorized to speak or act for the Town of Drumheller with respect to this Tender, are those whose positions or names have been specifically designated in the Issuing Office. Questions or concerns regarding this tender must be received by the contact below via email before the question period deadline.

For information regarding this project, you may contact:

Klohn Crippen Berger Ltd.
500 – 2618 Hopewell Place NE
Calgary, AB T1Y 7J7
Contact: Jonathan Peterson, P. Eng., Project Engineer
Email: jpeterson@klohn.com

The deadline for written questions and inquiries is the end of business (4:30 pm local time) on July 5, 2022. The Issuing Office will formally respond to all inquiries by no later than July 7, 2022.

1.5 OMISSIONS OR DISCREPANCIES

All communications regarding this tender shall be sent to the Issuing Office, The Owner will assume no responsibility for oral instructions or suggestions. Should the Proponent find discrepancies in, or omissions from the specifications, or should the Proponent be in doubt as to their meaning, the Proponent shall notify the Issuing Office, who may, if necessary, send written addenda to all Proponents.

Should a Proponent find discrepancies in, or omissions from, the Drawings or other Tender Documents, or should a Proponent be in doubt as to their meaning, the Proponent should at once notify the Issuing Office who may send direction to all Proponents. No oral interpretations shall be made to any Proponent as to the meaning of any part of the Tender Documents. Every request for an interpretation shall be made in writing and addressed to the Issuing Office's Authorized Representative:

Klohn Crippen Berger Ltd.
500 – 2618 Hopewell Place NE
Calgary, AB T1Y 7J7
Contact: Jonathan Peterson, P. Eng., Project Engineer
Email: jpeterson@klohn.com

1.6 AVAILABILITY OF TENDER DOCUMENTS

Tender Documents are available in electronic format for download from the Alberta Purchasing Connection website at www.purchasingconnection.ca, and from the Town website at www.drumheller.ca/do-business/tenders. The Owner assumes no responsibility or liability for the completeness of Tender Documents obtained from any other source. In the event of a discrepancy with Tender Documents obtained from any other source, the Tender Documents issued above will govern.

Proponents shall promptly notify the Issuing Office identified in **Subsection 0 Omissions and Discrepancies,** upon discovery of any such omissions and/or discrepancies.

1.7 *CONTRACT INFORMATION DOCUMENTS*

The Contract Information Documents listed herein are available for this project as noted in **Section 0 Availability of Tender Documents**.

The following engineering, environmental, and geotechnical information, reports, and other information are available for this tender:

- Town of Drumheller Flood Mitigation Design Reports relating to the Midland Dike Upgrades Project including:
    - Northwest Hydraulic Consultants, 2020 (1). Drumheller River Hazard Study: Hydraulic Modelling and Flood Inundation Mapping Report. Report Prepared for Alberta Environment and Parks, April 2020. Available upon request.
    - Northwest Hydraulic Consultants, 2020 (2). Drumheller River Hazard Study: Channel Stability Investigation Report. Report Prepared for Alberta Environment and Parks, April 2020. Available upon request.
    - Parkland Geotechnical, 2022. Berm Borrow Material Summary. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, March 31, 2020. Provided under separate cover.
    - Historical Resources Impact Assessment Approval with Conditions, September 10, 2021. Provided under separate cover.
- Additional reports available from https://floodreadiness.drumheller.ca/be-informed/resources/drumheller-resiliency-and-flood-mitigation-office
    - Aquatic Environment Assessment
    - Town of Drumheller Resiliency & Flood Mitigation Project, Environmental Risk Assessment
    - Rare Plant Survey for the Town of Drumheller Resiliency & Flood Mitigation Project

1.8 *PLANS AND DRAWINGS*

All separate plans and drawings listed in the tender document will be available to each of the Proponents and are available in electronic form for download from the Alberta Purchasing Connection website at www.purchasingconnection.ca, and from the Town website at www.drumheller.ca/do-business/tenders. Hard copies of these documents are not available for the tender but will be provided to the successful bidder.

1.9 *COMPLETING TENDER FORMS*

The Unit Price Schedules must be completed by:

- showing the Unit Price (where applicable), and the total for each item in the "Total Bid" column (in case of discrepancy the unit price figure will take precedence), and

- showing the tendered lump sum (where applicable) in the "Total Bid" column, and
- showing the sum of all tender item totals in the space marked "Total Tender."

The Tender must be signed by an authorized representative of the Proponent, and

- the official title of the Proponent must be shown, and
- the official seal of the Proponent must be affixed, or the signature must be witnessed.

1.10 *TENDER DEPOSIT*

The Tender must be accompanied by a certified cheque or bid bond made payable to the Town of Drumheller in the amount of ***ten percent (10%)*** of the total sum tendered for the work.

The unsuccessful Proponents' certified cheques or bid bonds will be returned as soon as possible after the award of the Contract, or if no Contract is awarded after such decision is reached by The Owner. The successful Proponent's certified cheque or bid bond will be returned upon receipt by The Owner of the necessary guarantee bonds.

1.11 *GUARANTEE BONDS*

Under Section 1.2.9, Security, of the General Specifications (see **Special Provision 0, Standard Specifications for Highway Construction and Bridge Construction Work)**, the successful Proponent shall deposit with the Town of Drumheller, at the time of signing the contract, the following bonds:

a) a Performance Bond in the amount of ***fifty percent (50%)*** of the agreed Tender price, covering the faithful performance of the Contract.
b) a Labour and Materials Payment Bond in the amount of ***fifty percent (50%)*** of the agreed Tender price.

Both bonds shall be issued by the same Surety Company licensed to do business in the Province wherein the work is located.

The cost of the bonds shall be borne by the Contractor.

The Proponent, with his or her Tender, shall enclose a "Consent of Surety" from the Surety Company stating that it is willing to supply the bonds referred to previously. The Consent of Surety will be required whether the Proponent uses a certified cheque or bid bond under the provisions of **Clause 1.10 Tender Deposit.**

1.12 *SITE CONDITIONS*

The Proponent must examine the site of the work before submitting a bid, either personally or through a representative, and satisfy himself as to the nature and location of the work, local conditions, soil structure and topography at the site of the work, the nature and quality of materials to be used, the equipment and facilities needed prior to and during the prosecution of the work, and all other matters which can in any way affect the work under this Contract. Submission of a Tender by the Proponent acknowledges awareness of all matters that such a site inspection would reveal to the reasonable Proponent.

1.13 *TENDERER'S MEETING*

A Tenderer's Meeting will be held on June 29, 2022, between the hours of 10:00 am and 12:00 pm at the DRFM office at the following location:

Town of Drumheller
Resiliency and Flood Mitigation Office
702 Premier Way
Drumheller, Alberta
T0J 0Y4

The Tenderer's Meeting will be followed by a site visit. Major subcontractors are strongly advised to attend. Others are invited to attend.

No information provided by The Owner or any of its representatives at the Tenderer's Meeting shall be binding unless such information is included in an addendum.

1.14 *PROJECT SCHEDULING AND COMPLETION OF THE WORK*

The Contractor shall schedule his or her operations so that the Work is substantially complete on **November 15, 2022,** and all Work is complete by **May 15, 2023.**

1.15 *SUBCONTRACTORS*

The Contractor named in the Agreement is solely responsible for all work under the Contract and the allocation of work to Subcontractors.

The Contractor is responsible for the administration of all Subcontractors. All disputes as to the scope of work to be carried out by the various Subcontractors shall be the responsibility of the Contractor so that all work is carried out to the satisfaction of the Consultant. No claims for Extras will be allowed on the basis that a Subcontractor did not include the same in their scope of work due to any subdivision of the work expressed or implied in the Plans or Specifications.

1.16 *HIRING OF APPRENTICES*

The Government of Alberta encourages all Proponents to consider employing apprentices on public sector construction projects. To find out more about hiring an apprentice and the supports available for their training, please visit http://tradesecrets.alberta.ca/.

1.17 *GOODS AND SERVICES TAX (G.S.T.)*

Tender prices are to be submitted G.S.T. exempt. Appropriate adjustments for G.S.T. will be added to the total tendered amounts by The Owner, if required.

1.18 *TIME FOR EXECUTING CONTRACT AND DAMAGES FOR FAILURE TO EXECUTE*

Tenders shall be open for acceptance by the Owner for ***thirty-five (35) days*** after the tender closing date.

Any Proponent whose Tender is accepted within the time set out above, will be required to execute the Contract in accordance with **Section 1.2.7.2, Forfeiture,** of the General Specifications (see **Special Provision 0 Standard Specifications for Highway Construction**).

1.19 *ACCEPTANCE OF TENDER AND ITS EFFECT*

The acceptance of the Tender shall bind the successful Proponent to execute the Contract in accordance with **Section 1.2.7.2, Forfeiture,** of the General Specifications (see **Special Provision 0 Standard Specifications for Highway Construction**).

Notwithstanding the provisions of **Clause 1.19 Acceptance of Tender and its Effect** hereinafter, or any other provisions in the Tender, if the Consultant, after acceptance of the Tender but before execution of the Contract, objects to any Subcontractor proposed to be employed by the successful Proponent in the performance of the Contract, and the Contractor refuses or neglects to nominate another Subcontractor, acceptable to the Consultant, the Tender may be rejected.

1.20 *SAFETY PREQUALIFICATION*

Contracts will only be awarded to Proponents who, prior to the time fixed for receiving tenders, possess a valid Certificate of Recognition (COR) or a valid Temporary Letter of Certification (TLC) for a standard COR or COR Equivalency Letter (COREL) for out of province Proponents, as issued by the Alberta Construction Safety Association (ACSA) or another certifying partner authorized by the Alberta Ministry of Labour to issue CORs, TLCs, or CORELs. The COR, TLC, or COREL must be relevant to the work. Possession of a Certificate of Recognition other than a standard COR, TCL, or COREL, such as a Small Employer Certificate of Recognition (SECOR) is not acceptable.

Prospective Proponents who do not possess a COR, a TLC for standard COR, or a COREL and wish to obtain information about obtaining one, are advised to contact:

The Alberta Construction Safety Association
225 Parsons Rd. SW
Edmonton, AB T6X 0W6
Telephone: (780) 453-3311 or (Toll Free) 1-800-661-2272
Fax: (780) 455-1120 or 1-877-441-0440
Web Site: www.acsa-safety.org
E-mail: edmonton@acsa-safety.org

or another certifying partner authorized by the Alberta Ministry of Labour.

It is the Proponent's responsibility to ensure his or her registration in the program is properly documented with the issuing certifying partner and The Owner will assume no liability for errors or omissions in this regard. The Proponent shall submit copies of valid safety certification with the Tender submission.

1.21 *FREEDOM OF INFORMATION AND PRIVACY ACT (FOIP)*

The Owner acknowledges that each Tender may contain information in the nature of a Proponent's trade secrets or commercial, financial, labour relations, scientific or technical information of or about a Proponent. The Owner acknowledges and agrees that Tenders in response to this Request for Tender are provided in confidence and protected from disclosure to

the extent permitted under law. The Owner is bound by the Freedom of Information and Privacy Act (Alberta) and all documents submitted to The Owner will be subject to this protection and all disclosure provisions of this legislation.

1.22 *GIFTS AND DONATIONS*

The successful Proponent shall ensure that no representative of the successful Proponent shall extend entertainment, gifts, gratuities, discounts, or special services, regardless of value, to any employee of The Owner. The successful Proponent shall report to the Issuing Office, any attempt by The Owner's employees to obtain such favors.

1.23 *AGREEMENT ON INTERNAL TRADE AND NEW WEST PARTNERSHIP TRADE AGREEMENT*

The provisions of the Agreement on Internal Trade, Part IV, Chapter Five – Procurement and Annex 502.4, ("AIT") and the New West Partnership Trade Agreement ("NWPTA") apply to this Tender.

1.24 *SPECIFICATIONS AND STANDARD DRAWINGS*

Alberta Transportation's Specification, Specification Amendment, and select Drawing manuals referenced herein can be purchased separately from:

Alberta Transportation
Strategic Procurement Branch
Suite 310, 3rd Floor, Twin Atria Building
4999 - 98 Avenue
Edmonton, AB T6B 2X3
Telephone: (780) 415-1068

Alternatively, the documents may be viewed online on Alberta Transportation's web site at: https://www.alberta.ca/construction-contract-templates.aspx.

The city of Calgary Specification and select Drawing Manuals referenced herein can be viewed and/or purchased separately online on the City of Calgary's website at: https://www.calgary.ca/PDA/pd/Pages/Planning-and-development-resource-library/Publications.aspx.

1.25 *LIQUIDATED DAMAGES*

Liquidated Damages will not apply to this Work.

1.26 *ADDENDA*

Addenda, when issued, form part of the Tender Documents. The Proponent shall acknowledge receipt of each addendum in the space provided on the Tender forms. The individual items included in the addendum shall be added, deleted, or changed in accordance with the instructions contained in the addendum letter. A copy of each addendum will be inserted into the Contract document.

During the tendering period, all Addenda issued by the Issuing Office will be posted to the Alberta Purchasing Connection website at www.purchasingconnection.ca, and the Town website at

www.drumheller.ca/do-business/tenders to the Proponents to the address of each party recorded by the Issuing Office.

Proponents who have obtained Tender Documents from any source other than the Issuing Office will not receive the Addenda. Notwithstanding any other provision of this Tender, each Proponent must ascertain, prior to the time fixed for receiving tenders, that it has received all Addenda issued by the Issuing Office.

2 TENDER FORMS

2.1 *CONDITIONS*

The Undersigned (also referred to as the "Proponent" and the "Contractor"), having carefully read the Contract Documents listed in Article A-2 of the Agreement and inspected the site, hereby agrees to execute, and complete the Work contemplated in strict accordance with the said Contract Documents at the prices stipulated in the Unit Price Schedule.

It is understood that:

1. The estimated quantities shown in this Tender are approximate only and are used to compare bids.
2. No claim shall be made by the Proponent on account of any loss of anticipated profits resulting from any excess or deficiency in the estimated quantities.
3. Payment for work under this Contract will be made on the basis of quantities measured on the site and at the unit prices submitted, which shall be compensated in full for all the work done under the terms of the Contract.
4. The prices quoted shall bear a proper relationship to the value of work done or materials supplied.
5. The Owner reserves the right to terminate or to cancel any or all portions of the work and no claim shall be made on account of any loss of anticipated profits resulting from any cancellations or terminations in this Contract.
6. The Contractor is to complete the Unit Price for all items on the Unit Price Schedule.
7. The Owner reserves the right to accept or reject any or all tenders and to waive irregularities and informalities at its discretion. The Owner reserves the right to accept a tender other than the lowest tender without stating reasons. By the act of submitting its bid, the Proponent waives any right to contest in any legal proceeding or action the right of the Owner to award the work to whomever it chooses, in its sole and unfettered discretion, and for whatever reasons the Owner deems appropriate. Without limiting the generality of the foregoing, the Owner may consider any other factor besides price and capability to perform the work that it deems in its sole discretion to be relevant to its decision including but not limited to the following:
    a) any past experience with the Proponent or lack thereof;
    b) the results of any reference check done by the Owner;
    c) information relating to the financial state of the Proponent, however obtained;
    d) length of the construction period;
    e) specific time for construction.

The _____, Sureties are willing to provide a Performance Bond and a Labour and Materials Bond each in the amount of **50 percent (50%)** of the total amount tendered. The "Consent of Surety" form to this effect is complete.

Accompanying this Tender is the completed "Consent of Surety" along with a certified cheque or bid bond in the amount of **10 percent (10%)** of the total amount tendered for the Work.

If our Tender is accepted, we agree to commence the Work by the ____ day of _____, and to complete the Work on or before the ____ day of _____, or such later date as the Owner may for any reason determine.

It is understood that if this Tender is accepted within **thirty-five (35) days** of the time stated for the Tender closing date, and if the Proponent fails or declines to enter into a Contract in accordance with the terms of the Tender, the Proponent's certified cheque or bid bond shall be forfeited to the Owner as an accepted and agreed determination of the damages to which the Owner may be entitled by reason of the Proponent's failure or refusal to enter into such Contract.

Contractor's Signature	Contractor's Name (Proponent)
Print Name	Witness or Seal
Position in Company	Date
Address	

2.2 *VENDOR PARTICIPATION – RECEIPT CONFIRMATION FORM*

Midland Dike Upgrades Project (Tender No. 22.06.20A)

Please complete this form and email IMMEDIATELY to:

Klohn Crippen Berger Ltd.
500 – 2618 Hopewell Place NE
Calgary, AB T1Y 7J7
Contact: Jonathan Peterson, P. Eng., Project Engineer
Email: jpeterson@klohn.com

Failure to return these forms MAY result in a termination of communication regarding this Tender.

COMPANY NAME: _____

ADDRESS: _____

CITY: _____ PROVINCE: _____ POSTAL CODE: _____

CONTACT PERSON: _____

PHONE NO: _____ FAX NO: _____

EMAIL ADDRESS: _____

I have received a copy of the above noted Tender.

☐ **Yes**, I will be responding to this Tender. I understand any further correspondence will be made via email correspondence.

I agree to have DRFMO send further correspondence that it deems to be of an urgent nature by the following method:

☐ Email

☐ **No**, I will not be responding to this Tender. I understand that if I do not submit a Tender, this will not affect our company's status as a potential Proponent to the Town of Drumheller in the future. I also understand that if I do not return this form, our company will not receive any further notices with regard to this Tender.

SIGNATURE: _____

TITLE: _____ DATE: _____

2.3 *COMPLIANCE WITH THE SPECIFICATIONS*

This form must be completed and signed to constitute a formal Tender.

We have examined these Specifications thoroughly and fully understand all conditions that do or can affect the Work to be done under these Specifications. We hereby certify that the Work offered in our Tender complies in every respect to the Owner's Specifications.

Contractor's Name (Print)

Witness

Signature or Seal of Contractor (Proponent)

Print Name

Position in Company

Alberta Construction Safety Association Number or Equivalent Safety Certification Number ***mandatory***

Date

2.4 *ADDENDA RECEIVED*

(All Addenda Must be returned with tender submission)

Addendum:

#1_____
Date Received

#2_____
Date Received

#3_____
Date Received

#4_____
Date Received

#5_____
Date Received

_____
Contractor's Representative Signature

_____
Print Name

_____
Position in Company

_____
Contractor's Name (Proponent)

_____
Date

2.5 *UNIT PRICE SCHEDULE*

TOWN OF DRUMHELLER

Drumheller Resiliency and Flood Mitigation

FOR
Town of Drumheller
Midland Dike Upgrades Project
Tender No.: 22.06.20A
KLOHN CRIPPEN BERGER LTD. PROJECT NO.: A03409A05

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
1. GENERAL REQUIREMENTS					
1.1	Mobilization and Demobilization	Lump Sum	1	$	$
1.2	Existing and Temporary Access Roads	Lump Sum	1	$	$
2. SITE WORK					
2.1	Demolition and Removal	Lump Sum	1	$	$
2.2	Demolition and Salvage	Lump Sum	1	$	$
2.3	Clearing and Grubbing	sq. m.	18,000	$	$
2.4	Topsoil and Subsoil Stripping	sq. m.	1,850	$	$
2.5	Excavation	cu. m.	5,000	$	$
2.6	Impervious Fill Zone 1A	cu. m.	28,000	$	$

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
2.7	Topsoil Placement	cu. m.	1,850	$	$
2.8	Imported Topsoil	cu. m.	1,850	$	$
2.9	Bedding 5B	cu. m.	175	$	$
2.10	Riprap Class 1	cu. m.	40	$	$
2.11	Riprap Class 2	cu. m.	300	$	$
2.12	Ø 300 mm PVC Pipe	lin. m.	15	$	$
2.13	Ø 450 mm Concrete Pipe	lin. m.	45	$	$
2.14	Ø 600 mm Concrete Pipe	lin. m.	115	$	$
2.15	1S Manhole 1.2 x 1.2	each	2	$	$
2.16	1S Manhole 1.5 x 1.5	each	1	$	$
2.17	5A Manhole	each	1	$	$
2.18	Ø 450 mm Concrete Headwall	each	2	$	$
2.19	Ø 600 mm Concrete Headwall	each	14	$	$
2.20	Ø 300 mm Tideflex Valve (TF-1)	each	1	$	$

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL BID
2.21	Ø 600 mm Tideflex Valve (TF-1)	each	5	$	$
2.22	Ø 450 mm Sluice Gate	each	2	$	$
2.23	Ø 600 mm Sluice Gate	each	1	$	$
2.24	Ø 600 mm Grated Inlet	each	5	$	$
2.25	Willow Plantings	lin. m.	26	$	$
2.26	Hydroseed	sq. m.	20,000	$	$
2.27	Vehicle Access Control Gates	each	2	$	$
3. MAINTENANCE					
3.1	Landscape Maintenance Year 1	year	1	$	$
3.2	Landscape Maintenance Year 2	year	1	$	$
4. CASH ALLOWANCES					
4.1	Care of Water and Turbidity Barriers	Cash Allowance			$ 50,000.00
4.2	Repairs to Existing Storm Sewer	Cash Allowance			$ 100,000.00
				TOTAL TENDER AMOUNT:	

Contractor's Representative Signature	Contractor's Name (Print)
Print Name	
Position in Company	Witness or Seal
Contractor's G.S.T. No.	Date

3 TENDER AMENDMENT FORM

TENDER AMENDMENT
Town of Drumheller – Drumheller Resiliency and Flood Mitigation
DRFMO Tender No.: 22.06.20A Klohn Crippen Berger Ltd. Project No.: A03409A05

We, _____
(Name of Contractor)

the undersigned, modify the Tender Unit Price Schedule for our Tender as shown in the following table.

CONTRACT UNIT PRICE SCHEDULE CHANGES Replacing ALL Previous Unit Price Changes				
BID ITEM NO.	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT PRICE CHANGE + OR -**	**TOTAL CHANGE FOR THIS ITEM + OR -**
			+ or – Change in Total Tender	

We also acknowledge and agree that:

1. This change supersedes all previous changes including those to other bid items. Previously submitted changes are all null and void.
2. We accept full responsibility for any lack of confidentiality arising from the use of this process.
3. We accept full responsibility, for failure of any reason whatsoever, of these revisions to arrive on time, for their accuracy, and for their completeness.

_____ Being _____
Signature Position in Company

Of _____ dated _____
Company Name Date

Email To: Deighen Blakely, P. Eng., Program Director
Subject: Midland Dike Upgrades Tender Email.: purchasing@drumheller.ca

4 GENERAL PROVISIONS

4.1 *DEFINITIONS AND INTERPRETATIONS*

4.1.1 DEFINITIONS

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

4.1.1.1 "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.

4.1.1.2 "Agreement Form" means the document which, when executed by the Owner and the Contractor, formalizes the Contract.

4.1.1.3 Omitted: "Alberta Transportation" definition.

4.1.1.4 "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.

4.1.1.5 "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.

4.1.1.6 "Change Proposal" means a written communication, issued by the Owner to the Contractor on or after the date of execution of the Agreement Form, containing a proposed Change in the Work and requiring the Contractor to submit a quotation for executing such proposed change, including the Contractor's proposed changes to either or both the Contract Price or the Contract Time.

4.1.1.7 "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.

4.1.1.8 "Construction Equipment" means equipment, appliances and things required for the performance of the Work but does not include Permanent Work or Temporary Work.

4.1.1.9 "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.

4.1.1.10 "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.

4.1.1.11 "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, conditions related to Public Works Act claims;
- the Specifications;
- the Drawings;
- Addenda;
- Regulatory Permits and Authorizations;
- and such other documents as may be identified as Contract Documents, and shall include amendments thereto made pursuant to the provisions of the Contract.

4.1.1.12 "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.

4.1.1.13 "Contract Time" means the period of time specified in the Contract for attainment of Substantial Performance of the Work, including authorized adjustments thereto.

4.1.1.14 "Contractor" means the person, firm or corporation contracting directly with the Owner to perform the Work.

4.1.1.15 "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 the performance of the item of work to which it relates.

4.1.1.16 Omitted: The "Crown" definition.

4.1.1.17 "Day" means a calendar day.

4.1.1.18 "Department" means the Town of Drumheller or such successor department.

4.1.1.19 Omitted: "Deputy Minister" definition.

4.1.1.20 "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.

4.1.1.21 "Force Majeure Event" means any war, invasion, insurrection, armed conflict, act of foreign enemy, revolution, terrorist act, interference by military authorities, nuclear explosion, contamination by ionizing radiation, epidemic, pandemic including Covid-19, or quarantine restriction that prevents, delays or interrupts the performance of any obligation under this Contract, other than any obligation to pay any money, and provided such event does not occur by reason of:

- The negligence of the Party relying on the Force Majeure Event (or those for whom it is in law responsible); or
- Any act or omission of the Party relying on the Force Majeure Event (or those for whom it is in law responsible) that is in breach of this Contract.

4.1.1.22 "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.

4.1.1.23 "Invention" means any new and useful practice, process, machine, device, manufacture or composition of matter, or any new and useful improvement thereof.

4.1.1.24 "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.

4.1.1.25 "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.

4.1.1.26 "Milestone Date" means a time period or date specified in the Contract for completion or attainment of specified portions of the Work.

4.1.1.27 "Owner" means the Town of Drumheller and includes a person acting for, or if the office is vacant, in place of, the Owner and the Owner's successors in the office.

4.1.1.28 "Owner's Representative" means the officer or employee of the Town of Drumheller identified in writing by a duly authorized departmental officer to represent the Owner under the Contract.

4.1.1.29 "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.

4.1.1.30 "Permanent Work" means any structure, Product or thing constructed, manufactured or installed in the performance of the Work, but does not include Temporary Work.

4.1.1.31 "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".

4.1.1.32 "Project" means the total construction of which the Work to be provided under the Contract may be the whole or a part.

4.1.1.33 "Regulatory Requirements" means laws, ordinances, rules, regulations, orders, codes, and other legally enforceable requirements in effect and applicable to the performance of the Work.

4.1.1.34 "Schedule of Prices" means the completed Schedule of Prices submitted by the Contractor with his Bid, as accepted by the Letter of Acceptance.

4.1.1.35 "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.

4.1.1.36 "Specifications" means that portion of the Contract Documents comprising Divisions 01 onwards of the specification format including the General Requirements and technical specifications.

4.1.1.37 "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.

4.1.1.38 "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.

4.1.1.39 "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.

4.1.1.40 "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.

4.1.1.41 "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.

4.1.1.42 "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.

4.1.1.43 "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.

4.1.1.44 "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.

4.1.1.45 "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.

4.1.1.46 "Work" means the total construction and related services required by the Contract Documents.

4.1.2 INTERPRETATION

The Contract shall be interpreted as follows:

4.1.2.1 The Contract Documents are complementary, and what is required by anyone shall be as binding as if required by all.

4.1.2.2 Words importing the singular also include the plural and the masculine includes the feminine and vice-versa where the context requires.

4.1.2.3 "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.

4.1.2.4 Words and abbreviations which have well-known technical meanings are used in the Contract in accordance with such recognized meanings.

4.1.2.5 Words importing persons or parties shall include firms and corporations and any organization having legal capacity.

4.1.2.6 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.

4.1.2.7 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.

4.1.2.8 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.

4.1.2.9 Unless the context indicates otherwise, all monetary amounts shall be interpreted as amounts in the lawful currency of Canada.

4.1.2.10 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.

4.1.2.11 When provision is made for a communication to be "written" or "in writing" this means any hand-written, type- written or printed communication, including facsimile transmissions.

4.1.2.12 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.

4.1.2.13 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.

4.1.2.14 This Contract may be executed by the parties in counterparts and may be delivered by email in Portable Document Format (PDF), each of which upon execution and delivery shall be deemed an original and all which taken together shall constitute one and the same agreement.

4.1.2.15 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 Supplementary Conditions.

.4 Conditions of Contract, including General, Payment, Security, and Insurance Conditions.

.5 Drawings.

.6 Specifications.

.7 Drawings of a larger scale shall govern over those of a smaller scale of the same date.

.8 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.

4.2 *LETTER OF CREDIT IN LIEU OF HOLDBACK*

4.2.1 CONTRACT PERFORMANCE SECURITY

4.2.1.1 Contractor shall provide security for performance of the Contract in the form of a Performance Bond for 50% of the Contract Price.

4.2.1.2 Bond shall be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Performance Bond, CCDC Document No. 221.

4.2.1.3 Bond shall be issued by a duly incorporated surety company authorized to transact business of the suretyship in the Province of Alberta.

4.2.1.4 Consign bond to "the Town of Drumheller".

4.2.1.5 Submit bond to the Owner within 15 days after date of issuance of Letter of Intent to Enter Contract.

4.3 *INSURANCE CONDITIONS*

4.3.1 RELATED REQUIREMENTS

4.3.1.1 Hold Harmless Agreement: General Conditions.

4.3.2 GENERAL REQUIREMENTS FOR INSURANCE

4.3.2.1 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, the Contractor shall provide, maintain, and pay for the insurance coverages specified in this section.

4.3.2.2 Form: Insurance policies shall be placed with Insurers who comply with the Insurance Act (Alberta) and be in forms acceptable to the Owner. All required insurance shall be primary and shall not require the pro rata sharing of any loss by any insurer of the Owner.

4.3.2.3 Duration: Unless otherwise specified, required insurance coverages shall be maintained continuously from the date of commencement of the Work until the date of Total Performance of the Work.

4.3.2.4 Waiver of Recourse: The Contractor waives all rights of recourse against the Owner for damages to the Contractor's property.

4.3.2.5 Deductible: The amount of deductible on any insurance provided by the Contractor shall be reasonable and shall be subject to the Owner's approval.

4.3.2.6 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 including cancellations for non-payment of premium.

4.3.2.7 Proof of Insurance: Prior to commencement of any activities on Site, the Contractor shall provide the Owner with proof that insurance coverages are in effect and meet the specified conditions. Proof of insurance shall be in the following forms:

.1 Completed Certificate of Liability Insurance.

.2 Completed Certificate of Property Insurance.

.3 Insurer's standard certificate for insurance coverage.

In addition, the Contractor shall at any time upon request, promptly file a certified true copy of any insurance policy and shall otherwise provide proof of any required insurance, in a form acceptable to the Owner.

4.3.2.8 Subcontractors' Insurance: The 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, the 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. The named insureds on such wrap up liability insurance policy shall be the Contractor and the Owner. The requirements under Article 3 – General Liability Insurance shall apply to such wrap up liability insurance and in addition, the policy shall contain completed operations liability coverage, which shall remain in effect for a period of 12 months after the date of Interim Acceptance of the Work

4.3.3 GENERAL LIABILITY INSURANCE

4.3.3.1 The Contractor shall provide General Liability Insurance with limits of not less than $10,000,000.00 inclusive per occurrence, insuring against bodily injury, death, and property damage including loss of use thereof. Such insurance shall include but not necessarily be limited to coverage for:

.1 Owner's and Contractor's protective liability,

.2 blanket written contractual liability,

.3 personal injury liability,

.4 non-owned automobile liability (minimum sub-limit $2,000,000),

.5 broad form property damage endorsement (as per as per IBC 2313 or similar. Minimum sub-limit $1,000,000),

.6 sudden and accidental pollution,

.7 Forest-fire fighting expenses (minimum sub-limit $250,000).

4.3.3.2 Where such further risks exist, General Liability Insurance shall also include coverage for the following, to limits specified in clause 4.3.3.1:

.1 Operations requiring the use of explosives for blasting, pile driving or caisson work, or removal or weakening of support of property, building, or land.

.2 Elevator and hoist liability.

.3 Operation of attached machinery.

4.3.3.3 General Liability Insurance shall:

.1 not include the Owner as a named insured, and

.2 shall be maintained continuously until twelve months following the date of Substantial Performance of the Work or until the date of Total Performance of the Work, whichever is later.

4.3.4 AUTOMOBILE LIABILITY INSURANCE

4.3.4.1 The Contractor shall provide Automobile Liability Insurance on all vehicles owned, operated, or licensed in the Contractor's name, with limits of not less than $5,000,000.00 inclusive per occurrence for bodily injury, death, and property damage.

4.3.5 AIRCRAFT AND WATERCRAFT LIABILITY INSURANCE

4.3.5.1 Where such risks exist, Contractor shall provide Aircraft Liability Insurance and Watercraft Liability Insurance on all aircraft and watercraft, owned, operated, or licensed in Contractor's name and non-owned aircraft and watercraft used in Contractor's operations, with limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof.

4.3.6 COURSE OF CONSTRUCTION AND BOILER INSURANCE

4.3.6.1 The Contractor shall provide Course of Construction Insurance in the form of:

.1 an All-Risks Builder's Risk Policy, or

.2 if appropriate, due to the nature of the Work, and subject to the Owner's approval, an All-Risks Installation Floater,

Coverage shall:

.1 insure not less than the sum of the amount of the Contract Price and, if any the full value of Products specified to be provided by the Owner for incorporation into the Work.

.2 extend to any location and while in transit and shall be maintained continuously until the date of Substantial Performance of the Work.

.3 include loss or damage caused by flood.

.4 include loss or damage caused by earthquake.

4.3.6.2 Where such risks exist, the Contractor shall provide Boiler and Machinery/Equipment Breakdown Insurance insuring not less than the sum of the amount of the Contract Price and the full value of Products specified to be provided by the Owner for incorporation into the Work. Such risk shall be deemed to exist when the Work includes any boiler, fired or unfired pressure vessel, refrigerating or air conditioning system, mechanical or electrical machine or apparatus used for the generation, transmission, or utilization of mechanical or electrical power. The insurance coverage shall not less than the insurance provided by a comprehensive boiler and machinery policy. The policy shall have the same limits as specified for the course of construction policy and shall be written on a replacement cost basis and shall cover all boilers, pressure vessels, and other objects insurable under a standard boiler and machinery policy. The named insureds on the insurance policy shall be the Contractor and the Owner. Other insureds shall include all subcontractors, consultants, and subconsultants of every tier, whether named or unnamed in the policy, and all others having an insurable interest in the Work as other insureds. The policy shall be maintained continuously until the date of Substantial Performance of the Work or until such objects have been installed, tested, and accepted by the Owner, whichever is the latest.

4.3.7 CONTRACTOR'S EQUIPMENT INSURANCE

4.3.7.1 The Contractor shall provide insurance covering construction machinery and equipment owned, rented, or used by the Contractor for performance of the Work, in such forms and amounts as will enable the expeditious replacement or repair of damaged or destroyed equipment.

4.3.8 OTHER INSURANCE

4.3.8.1 The 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.

4.4 *PAYMENT CONDITIONS*

4.4.1 FEDERAL GOODS AND SERVICES TAX

4.4.1.1 Monies payable by the Owner to the Contractor shall be charged the federal Goods and Services Tax (GST).

4.4.2 BASIS OF PAYMENT

4.4.2.1 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.

4.4.2.2 Payment for Unit Price Work shall be based on the Unit Prices in the Contract.

4.4.2.3 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.

4.4.2.4 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 the Contractor. Fringe benefits shall include health care, vacations with pay, sick time allowance, pension plan, life and disability insurance, and 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:

.1 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 the cost of owning, operating (including wages for equipment operators but not including travel and subsistence costs for equipment operators) loading, unloading, assembling, erecting, and dismantling.

.2 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.

.3 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.

.4 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.

.4 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.

.5 Cost of special services, including the cost of architects, engineers, specifiers, surveyors, testing laboratories, and inspection agencies.

.6 Supplemental costs, including:

.1 travel and subsistence costs of the Contractor's employees (including equipment operators under clause 4.4.2.4.3.);

.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.

.7 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 fees 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.

4.4.2.5 With respect to Cost Plus Work:

.1 Costs payable by the 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, planning and scheduling of work, expendable and unexpendable small tools, including maintenance thereof, and recruitment and training of site staff.

.3 The Contractor shall obtain the Owner's prior approval to subcontract or enter into other agreements for Cost Plus Work.

.4 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.

4.4.3 MEASUREMENT FOR PAYMENT

4.4.3.1 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.

4.4.4 PROGRESS PAYMENTS

4.4.4.1 Prior to Substantial Performance of the Work, the Owner shall make monthly payments to the Contractor.

4.4.4.2 Within 7 days after the end of each monthly payment period, the Contractor shall submit to the Owner:

.1 completed Statutory Declaration Form 00630A, at and after the second monthly payment period,

.2 any data requested by the Owner to assist the Owner to determine the amount due and payable to the Contractor, and

.3 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.

4.4.4.3 The Owner shall, within 42 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 4.4.4.2, 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 4.4.11;

.2 any withholdings under clause 4.4.12.; and

.3 retention of the holdback amount calculated by applying the holdback percentage referred to in clause 4.4.5. to the amount payable to the Contractor under clause 4.4.4.3 after any deductions and withholdings.

4.4.4.4 For Unit Price Work, the Owner may, at his discretion, make partial payment based on partial completion of the scope of a single unit of an item of Work.

4.4.4.5 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.

4.4.4.6 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.

4.4.5 HOLDBACK

4.4.5.1 The Owner shall hold back 10% from each progress payment referred to in clause 4.4.4, pursuant to the Builders Lien Act.

4.4.5.2 Up to 100% of retained holdback monies shall be payable by the Owner to the Contractor not less than 45 days after the date of Substantial Performance of the Work as certified by the Owner provided:

.1 third party claims, received by the Owner pursuant to the Public Works Act, the Builders Lien Act or applicable or addressed and a course of action agreed to by the Owner and the Contractor, and

.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 00630A.

4.4.5.3 The Owner shall, within 63 days after Substantial Performance and subject to having received within the time specified any required information referred to in clause 4.4.5.2, pay to the Contractor 100% of retained holdback monies, subject to any deductions under clause 4.4.11. and to any withholdings under clause 4.4.12., and subject further to withholding:

.1 an amount equal to twice the Owner's estimate of the cost to the Owner of remedying any defects described in the certificate of Substantial Performance of the Work, and

.2 an amount equal to the Owner's estimate of the cost to the Owner of completing any outstanding work described in the certificate of Substantial Performance of the Work.

4.4.5.4 If the Owner withholds a portion of the retained holdback pursuant to clause 4.4.5.3, the Owner shall, at such reasonable times and intervals as the Owner may determine, pay to the Contractor the balance of the retained holdback, as and when the cause or causes for the withholding are removed.

4.4.5.5 When a certificate of Substantial Performance for part of the Work has been issued by the Owner, the provisions of clause 5.2 shall apply proportionately to such part of the Work.

4.4.6 PAYMENT AFTER SUBSTANTIAL PERFORMANCE

4.4.6.1 After Substantial Performance of the Work, the Owner shall make periodic payments to the Contractor on the same basis and conditions as specified in clause 4.4.4, except that such payments:

.1 shall be made at such reasonable times and intervals as the Owner may determine, and

.2 shall not be subject to hold back.

4.4.6.2 When a certificate of Substantial Performance for part of the Work has been issued by the Owner, the provisions of this clause shall apply proportionately to such part of the Work.

4.4.7 FINAL PAYMENT

4.4.7.1 The Owner shall prepare the final statement and make the final payment to the Contractor.

4.4.7.2 Within 42 days after the date of Total Performance of the Work, the Contractor shall submit to the Owner:

.1 any data requested by the Owner to assist the Owner to determine the final amount due and payable to the Contractor,

.2 a completed Statutory Declaration Form 00630A, and

.3 a letter of clearance from Workers' Compensation Board.

4.4.7.3 Subject to having received within the time specified any required information referred to in clause 4.4.7.2, the Owner shall, within 63 days after the date of Total Performance of the Work, prepare and deliver to the Contractor the final statement, stating the final amount which the Owner determines to be due and payable by the Owner to the Contractor.

4.4.7.4 The Owner shall, within 42 days after the final statement is issued to the Contractor, pay the Contractor the final amount.

4.4.7.5 If the final statement is considered by the Contractor to be incorrect, the Contractor shall, within 63 days of receipt thereof, submit to the Owner a notice of claim, including substantiation, notwithstanding the time provisions of clause 4.4.10 of the General Conditions

4.4.7.6 If the Owner does not receive a notice of claim pursuant to clause 4.4.7.5 within the time specified, the final statement shall be considered correct.

4.4.7.7 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.

4.4.8 OWNER'S LIABILITY

4.4.8.1 After the final payment issued pursuant to clause 4.4.7.4 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 therefor prior to or within the time specified in clause 4.4.7.5.

4.4.9 DELAY IN MAKING PAYMENT

4.4.9.1 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.

4.4.10 RIGHT OF SET-OFF

4.4.10.1 10.1 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.

4.4.10.2 10.2 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.

4.4.11 DEDUCTIONS FROM PAYMENTS

4.4.11.1 The Owner may deduct from any amount claimed by or payable to the Contractor:

.1 an amount at least equal to the value, as determined by the Owner, of work not in accordance with Contract Documents,

.2 the amount of any unresolved third-party claim submitted pursuant to the Public Works 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.

4.4.12 WITHHOLDING OF PAYMENT

4.4.12.1 The Owner may withhold all or part of any amount payable to the Contractor in order to protect the Owner or third parties from loss due to the 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.

4.4.12.2 Owner may withhold all or part of any amount payable to Contractor due to Contractor's persistent failure to provide submittals in accordance with the Contract Documents.

4.4.12.3 When the causes for withholding payment pursuant to clauses 4.4.12.1 or 4.4.12.2 are removed to the Owner's satisfaction, the Owner shall pay the Contractor the amount previously due and payable with the next progress payment.

4.4.13 TITLE TO AND ACCEPTANCE OF WORK

4.4.13.1 The 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.

4.4.13.2 The 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.

4.4.13.3 Payments made by the 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.

4.5 *PUBLIC WORKS AND ACT CLAIMS*

4.5.1 GENERAL

4.5.1.1 The Public Works Act (Alberta) applies to this Project. The Builders' Lien Act (Alberta) does not apply.

4.5.1.2 The Public Works Act allows any person who has not received proper payment, regardless of their level in the contracting chain, to make a claim directly to the Owner.

4.5.1.3 This Section specifies procedures for making a claim under the Public Works Act.

4.5.1.4 For the purpose of interpreting the "Notice of Claim" provisions under Section 14 of the Public works Act, this Contract shall be deemed to be a contract for work other than a highway or road as defined in section 1 of schedule 14 of the Government Organization Act. The 45-day claim period as set out in Section 14(3)(a) shall apply.

4.5.2 POSTING OF CLAIMS INFORMATION

4.5.2.1 Contractor shall display, at the Site, on a bulletin board of adequate size, a copy of each of the following:

.1 This Specification Section.

.2 Notice of Public Works Act Claim Form (copy appended to this Section).

.3 Labour and Material Payment Bond, if provided under the Contract.

4.5.2.2 Protect display in plastic sleeves and maintain in legible condition for duration of Contract.

4.5.2.3 The Owner may, upon request, waive the requirement to post claims information where it is not practicable to display this information at the Site.

4.5.3 CLAIMS PROCEDURE

4.5.3.1 Complete Notice of Public Works Act Claim form (copy appended to this Section) and submit form to address indicated on form within 45 Days after the last day on which labour, equipment, material or services giving rise to claim were provided.

4.5.3.2 Owner will acknowledge receipt of claim in writing.

4.5.3.3 The claimant shall, if requested by Owner, submit additional evidence in support of claim.

4.5.4 EXTRACT FROM PUBLIC WORKS ACT

Notice of claim

14 (1) When

(a) a person provides labour, equipment, material or services used or reasonably required for use in the performance of a contract with the Crown for the construction, alteration, demolition, repair or maintenance of a public work, and

(b) that person is not paid by the party who is legally obliged to pay that person, that person may send a notice of that person's claim to the Minister, or agent of the Crown that is responsible for the public work.

(2) (b) that person is not paid by the party who is legally obliged to pay that person
(3) The notice of claim, other than for a claim referred to in subsection (2), must

(a) be sent by registered mail not later than 45 days after the last day on which the labour, equipment, material or services were provided, and

(b) set out the nature and amount of the claim in a form satisfactory to the Crown.

4.6 ***GENERAL CONDITIONS***

4.6.1 OWNER AND OWNER'S REPRESENTATIVE

4.6.1.1 Owner's Duties and Authority: The Owner shall carry out the duties and exercise the authority specified in the Contract.

4.6.1.2 Owner's Representative: The Owner shall appoint a representative who shall, unless the Contractor is expressly advised otherwise by the Owner or a duly authorized departmental officer, have full authority to act on behalf of and bind the Owner under the Contract.

4.6.1.3 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 4.6.1.3.1 to disapprove any work shall not prejudice the authority of the Owner to disapprove such work and to give instructions for the rectification thereof.

4.6.1.4 Instructions in Writing: The Contractor shall take instructions only from the Owner or any assistants appointed pursuant to clause 4.6.1.3. 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.

4.6.1.5 Owner Interpreter of Contract: The Owner in the first instance shall be the interpreter of the Contract and the judge of the Contractor's performance.

4.6.1.6 Owner's Determinations: 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.

4.6.1.7 Owner's Review: 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.

4.6.2 ASSIGNMENT, SUBCONTRACTING AND NOMINATION

4.6.2.1 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).

4.6.2.2 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.

4.6.2.3 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.

4.6.3 DOCUMENTS

4.6.3.1 Property and Use of Contract Documents: 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.

4.6.3.2 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.

4.6.3.3 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 4.6.3.3.1, 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.

4.6.3.4 Additional Instructions: 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.

4.6.3.5 Forms: 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.

4.6.4 GENERAL OBLIGATIONS

4.6.4.1 Contractor's Responsibilities: 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.

4.6.4.2 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.

4.6.4.3 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.

4.6.4.4 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 4.6.6.4, and

.2 the amount of any costs, valued in accordance with clause 4.6.8.3, 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 4.6.4.4.1 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.

4.6.4.5 Climatic and Weather Conditions: 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.

4.6.4.6 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.

4.6.4.7 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.

4.6.4.8 Owner May Object: 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.

4.6.4.9 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 the Contractor's superintendent unless another person is appointed and approved by the Owner.

4.6.4.10 Owner's Responsibilities for Safety

.1 If under clause 4.6.4.18 the Owner carries out work on the Site with his own workers he shall, in respect of such work and subject to clause 4.6.4.9:

.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 4.6.4.18 the Owner contracts with Other Contractors on the Site he shall require them to have the same regard for safety and avoidance of danger.

4.6.4.11 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 issues 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, when 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.

4.6.4.12 Responsibility to Rectify Loss or Damage: 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.

4.6.4.13 Hold Harmless Agreement: 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 or willful acts by the Contractor or the Contractor's employees or agents. This hold harmless shall survive the Contract.

4.6.4.14 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 4.6.4.14.1, 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.

4.6.4.15 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 clause 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 4.6.6.4, and

.2 the amount of such costs, which shall be added to the Contract Price.

4.6.4.16 Patent Rights: 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.

4.6.4.17 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.

4.6.4.18 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 4.6.4.18.1, 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 4.6.4.18.1, 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 4.6.8.3.

4.6.4.19 Permanent Work Designed by the 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 4.6.4.19.1 relates unless such information has been reviewed by the Owner, and the Contractor shall not thereafter alter such design without the Owner's review.

4.6.4.20 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 4.6.4.20.1 as if they were the Contractor.

4.6.4.21 Record of Labour and Construction Equipment: 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.

4.6.4.22 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.

4.6.4.23 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 4.6.4.23.1 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.

4.6.5 QUALITY OF PRODUCTS AND WORK

4.6.5.1 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.

4.6.5.2 Cost of Samples: All samples shall be supplied by the Contractor at his own cost if the supply thereof is provided for in the Contract.

4.6.5.3 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.

4.6.5.4 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 4.6.5.4.2 shall apply.

.2 Where, pursuant to clause 4.6.5.4.1, this clause applies, the Owner shall determine:

.1 any extension of time to which the Contractor is entitled under clause 4.6.6.4, and

.2 the amount of any costs incurred by the Contractor, which shall be added to the Contract Price.

4.6.5.5 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.

4.6.5.6 Dates For Inspection and Testing: The Contractor Shall agree with the Minster 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.

4.6.5.7 Rejection: If, at the time and place agreed in accordance with clause 4.6.5.6, Products are not ready for inspection or testing or if, as a result of the inspection or testing referred to in clause 4.6.5.5, 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.

4.6.5.8 Cost for Inspection and Testing: 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.

4.6.5.9 Independent Inspection: 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 4.6.1.3 and for this purpose such independent agency shall be considered as an assistant of the Owner.

4.6.5.10 Examination of Work Before Covering Up: 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.

4.6.5.11 Uncovering and making Openings: 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 4.6.5.9 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.

4.6.5.12 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 therefor, 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 4.6.5.12.1 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.

4.6.6 COMMENCEMENT, COMPLETION, CONTRACT TIME AND DELAYS

4.6.6.1 Commencement of Work: 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.

4.6.6.2 Possession of 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 4.6.6.4, 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.

4.6.6.3 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.

4.6.6.4 Extension of Contract Time

.1 In the event of:

.1 a change in the Work made under clause 4.6.8.1, 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 4.6.4.5, 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.

4.6.6.5 Contractor to Provide Notification and Details

.1 The Owner shall not be bound to make any determination pursuant to clause 4.6.6.4 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.

4.6.6.6 Interim Determination of Extension of Time: 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 4.6.6.5.1.2, 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.

4.6.6.7 Rate of Progress: 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, or Milestone Dates, 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 or Milestone Dates. 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.

4.6.6.8 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 notify the Owner, 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 issue a certificate of Substantial Performance of the Work.

.2 The Owner shall, within 21 days after the date of delivery of the notice referred to in clause 4.6.6.8.1, either issue to the Contractor, a certificate, 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 issue 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 certificate 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 certificate.

4.6.6.9 Substantial Performance of Part or Parts of Work

.1 In accordance with the procedure set out in clause 4.6.6.8, the Contractor may request and the Owner may issue a certificate of Substantial Performance 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.

4.6.6.10 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 notify 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 4.6.6.8.2, either issue a certificate of Total Performance of the Work or give instructions.

4.6.6.11 Warranty Performance of the Work: 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 4.6.7, has been completed to the satisfaction of the Owner.

4.6.6.12 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 4.6.6.12.1.1, 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 4.6.6.12.2.

4.6.7 WARRANTY

4.6.7.1 Warranty Period

.1 In the Contract the term "warranty period" shall mean a period of two (2) years, 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 4.6.6.8, or

.2 in the event of more than one certificate having been issued by the Owner under clause 4.6.6.9, 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 4.6.7.1.1.1 and 4.6.7.1.1.2, 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.

4.6.7.2 Completion of Outstanding Work: 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.

4.6.7.3 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 4.6.7.3.1 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 4.6.8.

4.6.7.4 Contractor's Failure to Carry Out Instructions: If the Contractor defaults in carrying out instructions issued pursuant to clause 4.6.7.2 or 4.6.7.3, 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.

4.6.7.5 Contractor to Search: 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 4.6.7.3 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.

4.6.8 CHANGES AND VARIATIONS

4.6.8.1 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, if such changes on the Contract Price shall be valued in accordance with clause 4.6.8.3 and any extension of the Contract Time shall be determined in accordance with clause 4.6.6.4. 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.

4.6.8.2 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.

4.6.8.3 Valuation of Changes in the Work

.1 Changes referred to in clause 4.6.8.1 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.

4.6.8.4 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 4.6.8.4.1 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.

4.6.8.5 Quantity Variations

.1 Except for items of Work, if any, for which the applicability of this clause 4.6.8.5 has been specifically excluded elsewhere in the Contract, the Owner and the Contractor may agree to adjust a rate or price contained in the Contract:

.1 if the actual quantity of work executed under the item exceeds or falls short of the estimated quantity specified in the Schedule of Prices by more than 15%; and

.2 if there is no off-setting adjustment with respect to the quantity of any other item of work; and

.3 if, based on the actual quantity of work executed and the rate or price contained in the Schedule of Prices, the extended amount of the item exceeds 15% of the original Contract Price; and

.4 if the Contractor believes that he has incurred significant additional expense as a result thereof or the Owner believes that the quantity variation entitles the Owner to an adjustment in the rate or price.

.2 An adjusted rate or price made pursuant to clause 4.6.8.5.1, where the actual quantity of work executed under the item exceeds the estimated quantity specified in the Schedule of Prices by more than 15%, shall apply only to the quantity that is in excess of 115%.

.3 An adjusted rate or price made pursuant to clause 4.6.8.5.1, where the actual quantity of work executed under the item falls short of the quantity specified in the Schedule of Prices by more than 15%, shall not exceed the rate or price that would cause the total amount paid for the item to exceed 85% of the product of the

original rate or price contained in the Schedule of Prices multiplied by the estimated quantity specified in the Schedule of Prices.

4.6.9 CHANGES IN COST AND REGULATORY REQUIREMENTS

4.6.9.1 Increase or Decrease in Cost: Subject to clause 4.6.9.2, 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, except where specified otherwise in the Contract Documents.

4.6.9.2 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 4.6.9.2.1 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.

4.6.10 CLAIMS REVIEW PROCESS AND DISPUTE RESOLUTION PROCEDURE

4.6.10.1 General

.1 Any claims or demands 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 assistants or the Owner's assistants' directors, officers, employees, agents or sub-contractors, in relation to the carrying out of the Work, are to be made only to, or against, the Owner. The Contractor waives any right to commence or carry on such claims or demands against any person other than the Owner.

.2 Unless otherwise agreed to in writing between the Owner and the Contractor, all disputes in respect of the application or interpretation of any provision of the Contract shall be determined in accordance with the Dispute Resolution Procedure (as defined in clause 4.6.10.3). Either party may at any time by notice to the other refer any question in respect of the application or interpretation of any provision of this Agreement to the Dispute Resolution Procedure. In the case of a Claim (as defined in clause 4.6.10.2), the Contractor shall follow the Claims Review Process for Contractor Claims (as set out in clause 4.6.10.2).

.3 The Contractor is hereby warned that under applicable laws there may be certain things that have to be done by certain times, otherwise the Contractor may lose its legal right to make, or continue with making, a claim against the Owner.

4.6.10.2 Claims Review Process for Contractor Claims : The review of the contractor's claim is subject to the following process:

.1 If a circumstance arises between the Owner and the Contractor, in connection with or arising out of the Contract or the carrying out of the Work, which the Contractor believes requires a change in payment or compensation under the Contract or a change in the time required to complete the Contract, such situation is considered a claim (the "Claim").

.2 As soon as the Contractor becomes aware of the Claim, the Contractor shall immediately begin to keep separate daily work records relating to the Claim. The records may include, but are not limited to, accurate quantity measurements, quality reports, actual direct costs, and actual indirect costs. The Contractor shall provide copies of such records in the manner and at the times requested by the Owner.

.3 Notice of claim

.1 Where the Contractor considers that there is a Claim, the Contractor shall send a notice of the Claim (the "Notice of Claim") to the Owner's Representative (as set out in the Contract).

.2 The Notice of Claim must be provided as soon as reasonably possible after the occurrence of the circumstance giving rise to the Claim, and not later than seven days after the occurrence of the circumstance or the Contractor becoming aware of the circumstance. It is imperative that the Contractor provide such notice in such manner and if the Contractor fails to provide such notice in such manner, the Owner may assert a claim for damages arising from such failure.

.3 The Notice of Claim shall be in such written form as directed in writing by the Owner or be in writing and expressly referring to this clause 4.6.10.2.3.3 and shall set out details about the Claim, including but not limited to:

.1 the Contract number;

.2 the Contract description;

.3 Notice of Claim number;

.4 identification of any documents or particulars that support the Claim (including any written or oral communications related to the Claim);

.5 detailed description of the substance of the Claim with dates, locations, incurred/projected direct costs (labour, material,equipment, etc.), incurred/projected indirect costs and any other items relevant to the Claim;

.6 relevant provisions of the Contract which support the Claim and the reasons why such provisions support the Claim;

.7 identify whether there is any impact on a critical path that will impact the construction schedule (as set out in the contract) thereby resulting in extension of the Contract Time (as defined in the contract);

.8 any other information that may be helpful for reviewing the Claim; and

.9 any proposals on ways to mitigate the impact of the Claim.

.4 In order for there to be an efficient and effective understanding of the Claim by the Owner, it is incumbent on the Contractor to provide all the necessary information reasonably needed by the Owner in order to understand the Claim and to provide all the necessary information in an organized, concise, and logical manner.

.5 Notwithstanding a Notice of Claim has been provided to the Owner, the Work must proceed or continue without delay.

.4 Owner Acknowledgement of the Notice of Claim

.1 Upon receipt of the Notice of Claim, the Owner shall provide a written acknowledgement to the Contractor and within seven days of the receipt of the Notice of Claim arrange a tri-party meeting of the Owner's representative, the Contractor and the Owner's assistant. The details of the Claim will be discussed at the tri- party meeting.

.5 Ongoing effect

.1 If the circumstance giving rise to the Claim has a continuing effect, then the Contractor shall submit to the Owner such further information at such intervals as may be reasonably required by the Owner.

.6 Review of the Claim

.1 If the Contractor wishes to have the Owner review the Claim, the Contractor shall send a written notice to the Owner's Representative (as set out in the Contract) no later than 28 days after submitting the Notice of Claim, expressly referring to this clause 4.6.10.2.3.6 and requesting the Owner to review the Claim (the "Level 1 Notice").

.2 Failure by the Contractor to provide the Level 1 Notice in such manner shall be deemed by the Owner to be an abandonment of the Claims Review Process for Contractor Claims (as set out in clause 4.6.10.2), unless otherwise agreed to in writing by the Owner.

.3 The parties will make bona fide efforts to review the Claim but the Work must proceed or continue without delay during the following process to review the Claim.

.4 Level 1 Review by the Owner's Representative

.1 within 14 days of the receipt of the Level 1 Notice, the Level 1 reviewer will provide a written acknowledgement of receipt of the Level 1 Notice to the Contractor;

.2 the Level 1 reviewer shall commence review of the claim as soon as possible and will meet with the Contractor within a period of 30 days from the receipt of the Level 1 Notice. During this meeting, the Level 1 reviewer and the Contractor will start the process of negotiating and entering into a claim review process agreement for the Claim (the "CRP

Agreement") addressing the schedule for the review, the process for the review (including participants), the date for providing the Level 1 reviewer's decision;

.3 the Contractor shall provide any additional information as set out in the CRP Agreement and as may be further required by the Level 1 reviewer;

.4 the Level 1 reviewer shall provide the Contractor with the Level 1 reviewer's decision (the "Level 1 Decision") by the date set out in the CRP Agreement;

.5 if the Contractor is not satisfied with the Level 1 Decision, the Contractor may submit the Claim to the Dispute Resolution Procedure set out in clause 4.6.10.3.

.5 The review of the Claim shall end no later than 12 months after the occurrence of the circumstance giving rise to the Claim. If the review of the Claim has not been completed within 12 months after the occurrence of the circumstance giving rise to the Claim, for any reason whatsoever including the inability of the parties to agree on a CRP Agreement, the Claim shall be deemed to have been unequivocally denied by the Owner and the Contractor may submit the Claim to the Dispute Resolution Procedure set out in clause 4.6.10.3.

4.6.10.3 Dispute Resolution Procedure :

.1 Any Claim that has not been resolved by the Claims Review Process for Contractor Claims (as set out in clause 4.6.10.2), or any disagreement or other dispute in respect of the application or interpretation of any provision of the Contract (the "Dispute"), will be resolved in accordance with the dispute resolution procedure set out in this clause 4.6.10.3 (the "Dispute Resolution Procedure"):

.1 the Dispute Resolution Procedure shall be started by delivery of a notice (the "Dispute Notice") in writing and expressly referring to this clause 4.6.10.3, from one party to the other party providing details of a Dispute and invoking the Dispute Resolution Procedure in respect of that Dispute.

.2 any Dispute Notice issued by the Contractor to the Owner must be sent to:

Project Director,

Town of Drumheller,

702 Premier Way,

Drumheller, Alberta T0J 0Y0

.3 within 30 days from the receipt of the Dispute Notice, officials designated by the Owner and the Contractor will meet (the "Settlement Meeting") at a mutually acceptable time and place to make all reasonable efforts to attempt to resolve the Dispute (all negotiations held pursuant to the Settlement Meeting are to be held on a without prejudice basis and will not be used by either party as evidence at any other proceeding); and

.4 if the Settlement Meeting does not result in resolution of the Dispute, either party may refer the Dispute to a court of law of competent jurisdiction.

4.6.10.4 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 4.6.10.4.1.

.3 If a third party sends written notice to the Owner of an undischarged obligation or unsatisfied claim referred to in clause 4.6.10.4.1, 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 obliges 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 4.6.10.4.3 shall apply only when written notice of the obligation or claim is sent to Owner not later than 45 days after the last day on which the labour, equipment, material or services giving rise to such obligation or claim were provided.

4.6.11 RELEASE FROM PERFORMANCE

4.6.11.1 Frustration: 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 4.6.15., terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof.

4.6.11.2 Removal of Construction Equipment on Termination: If the Contract is terminated pursuant to clause 4.6.11.1, the Contractor shall remove from the Site all Construction Equipment.

4.6.11.3 Payment if Contract Terminated

.1 If the Contract is terminated pursuant to clause 4.6.11.1, 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 4.6.11.2.

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.

4.6.12 SUSPENSION AND TERMINATION BY OWNER

4.6.12.1 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 4.6.12.2 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.

4.6.12.2 Owner's Determination Following Suspension

.1 Where, pursuant to clause 4.6.12.1, this clause applies the Owner shall determine

.1 any extension of time to which the Contractor is entitled under clause 4.6.6.4, 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.

4.6.12.3 Suspension Lasting More Than 91 Days: 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 4.6.12.1.1.1 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 4.6.8.1 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 4.6.14., in which case the provisions of clauses 4.6.14.2 and 4.6.14.3 shall apply.

4.6.12.4 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 4.612.4.1 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 4.6.14.

4.6.13 DEFAULT OF CONTRACTOR

4.6.13.1 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 4.6.2.1, 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 4.6.6.7 or an instruction issued pursuant to clause 4.6.6.12 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 4.6.2.2, 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 4.6.6.3,

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 4.6.13.1.1 or clause 4.6.13.1.2, 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.

4.6.13.2 Valuation at Date of Termination

.1 The Owner shall, as soon as practicable after any entry and termination by the Owner pursuant to clause 4.6.13.1, 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.

4.6.13.3 Payment After Termination: If the Owner terminates the Contractor's right to continue with the Work in whole or in part under clause 4.6.13.1, 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.

4.6.13.4 Assignment of Benefit of Agreement: The Contractor shall, if so instructed by the Owner within 14 days of the entry and termination referred to in clause 4.6.13.1, 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.

4.6.14 DEFAULT OF OWNER

4.6.14.1 Failure of Owner to Pay: 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.

4.6.14.2 Removal of Construction Equipment: Upon the termination of the Contract referred to in clause 4.6.14.1, the Contractor shall remove promptly from the Site all Construction Equipment.

4.6.14.3 Payment on Termination: In the event of termination pursuant to clause 4.6.14.1 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 4.6.11., but, in addition to the payments specified in clause 4.6.11.3, 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.

4.6.14.4 Contractor May Suspend Work

.1 As an alternative to termination under clause 4.6.14.1 but without prejudice to the Contractor's entitlement to terminate under clause 4.6.14.1, 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 4.6.14.4.1 and thereby suffers delay or incurs cost the Owner shall determine

.1 any extension of time to which the Contractor is entitled under clause 4.6.6.4, and

.2 the amount of such costs, which shall be added to the Contract Price.

4.6.14.5 Resumption of Work: When the Contractor suspends work or reduces the rate of work pursuant to clause 4.6.14.4.1 and the Owner subsequently pays the amount due, the Contractor's entitlement under clause 4.6.14.1 shall, if notice of termination has not been given, lapse and the Contractor shall resume normal working as soon as is reasonably possible.

4.6.15 FORCE MAJEURE

4.6.15.1 Force Majeure Event:

.1 If a Force Majeure Event occurs then notwithstanding any other provision of this Contract:

.1 To the extent that and for so long as either Party is prevented by the Force Majeure Event from performing any obligation under this Contract, that Party is relieved from liability due to its inability to perform or delay in performing that obligation; and

.2 If the Force Majeure Event wholly or substantially prevents the Contractor from proceeding with the Work then the times by which the Contractor shall obtain Substantial Performance of the Work or Total Performance of the Work as applicable shall be adjusted for the period of the Force Majeure Event.

.2 Upon either Party becoming aware of the occurrence of a Force Majeure Event that prevents that Party from performing any obligation under this Contract, that Party shall in a timely manner give the other Party notice of the Force Majeure Event, including reasonable details of the anticipated effects on performance of this Contract, and thereafter the Contractor shall, on an ongoing basis, notify the Owner of its plans for remedying or mitigating the effects of the Force Majeure Event.

.3 If the Contractor anticipates that the Force Majeure Event will delay the times by which the Contractor shall obtain Substantial Performance of the Work or Total Performance of the Work as applicable, but is of the opinion the delay can be avoided or mitigated through extraordinary measures, the Contractor may propose to the Owner that such extraordinary measures be taken by the Contractor at the Owner's expense.

Drumheller Resiliency and Flood Mitigation Office

Certificate of Liability Insurance

INSTRUCTIONS:

- This certificate must be completed by the Contractor's insurance agent or broker and submitted to The Town of Drumheller **prior to commencement of any activities** by the Contractor on site. Refer to the Insurance Conditions in the Contract Documents for detailed description of insurance requirements, including required coverages.
- An Insurer's standard certificate of insurance is **not acceptable** in lieu of this Town of Drumheller form, unless modified to provide **all** information required by this form.
- It is understood that this certificate is issued as information only. It does not amend, extend or alter coverages afforded by the policies described herein.
- Submit the completed certificate to: **Town of Drumheller**
  702 Premier Way
  Drumheller, AB
  T0J 0Y4

Identification of Insured

Contractor's Name		
Contractor's Address		
City / Town	Province	Postal Code

Identification of Contract

Contract Name (location and description of the Work as it appears in the Contract Documents)	Project ID (from Contract Documents)
	Contract Number
	CPIN

General Liability Insurance

Insurer's Name		
Policy Number	Expiry Date month (name of), date, year	Limit of Liability (per occurrence)

Coverages provided by this Policy (check applicable coverages)

- ☐ Owner's and Contractor's protective liability
- ☐ Blanket written contractual liability
- ☐ Personal injury liability
- ☐ Non-owned automobile liability
- ☐ Broad form property damage endorsement
- ☐ Sudden and accidental pollution liability
- ☐ Blasting
- ☐ Piledriving or caisson work
- ☐ Removal or weakening of support of property, building or land
- ☐ Elevator and hoist liability
- ☐ Operation of attached machinery
- ☐ Forest fire-fighting expenses

Certificate of Liability Insurance

Drumheller Resiliency and Flood Mitigation Office

Automobile Liability Insurance

Insurer's Name		
Policy Number	Expiry Date month (name of), date,year	Limit of Liability (per occurrence)

Aircraft Liability Insurance (if applicable)

Insurer's Name		
Policy Number	Expiry Date month (name of), date,year	Limit of Liability (per occurrence)

Watercraft Liability Insurance (if applicable)

Insurer's Name		
Policy Number	Expiry Date month (name of), date, year	Limit of Liability (per occurrence)

Certification

The undersigned hereby certifies that:

- The policies described herein, subject to their terms, conditions, and exclusions, have been issued to the named insured and are in force at this time.
- Coverages afforded under said policies will not be cancelled or materially changed to restrict coverage unless thirty (30) days advance written notice has been given to the Town of Drumheller at the address shown on page 1 of this form and each of the policies have been endorsed to this effect.
- The undersigned is an authorized representative of each of the insurance companies listed herein, and has full knowledge of the facts set forth herein and believes them to be true.

Name of Issuing Agency			
Address of Issuing Agency			
City / Town	Province	Postal Code	Telephone No.
Name of Authorized Representative (print or type)	Signature of Authorized Representative		Date of Issue

Drumheller Resiliency and Flood Mitigation Office

Certificate of Property Insurance

INSTRUCTIONS:

- This certificate must be completed by the Contractor's insurance agent or broker and submitted to the Town of Drumheller **prior to commencement of any activities** by the Contractor on site. Refer to the Insurance Conditions in the Contract Documents for detailed description of insurance requirements, including required coverages.
- An Insurer's standard certificate of insurance is **not acceptable** in lieu of this Town of Drumheller form, unless modified to provide **all** information required by this form.
- It is understood that this certificate is issued as information only. It does not amend, extend or alter coverages afforded by policies described herein.
- Submit the completed certificate to: **Town of Drumheller**
  702 Premier Way
  Drumheller, AB
  T0J 0Y4

Identification of Insured

Contractor's Name		
Contractor's Address		
City / Town	Province	Postal Code

Identification of Contract

Contract Name (location and description as it appears in the Contract Documents)	Project ID (from Contract Documents)
	Contract Number
	CPIN

Drumheller Resiliency and Flood Mitigation Office

Certificate of Property Insurance

Course of Construction Insurance

Insurer's Name		
Policy Number	Expiry Date month (name of), date, year	Total Insured Value

Form of Policy (check applicable)

☐ All Risks Builder's Risk Policy ☐ Other (specify below)

☐ All Risks Installation Floater

Limits of Liability

$	$	$
At Place of Work	At any other location	In transit

Deductible

$	$	$
At Place of Work	At any other location	In transit

Coverages provided by this Policy (check applicable coverages)

☐ All risks coverage

☐Primary Insurance, **not** requiring loss sharing with other insurers

☐Town of Drumheller included as a named insurable insured

☐Subcontractors, sub-subcontractors and others with an interest, included as additional insureds

Drumheller Resiliency and Flood Mitigation Office

Certificate of Property Insurance

Boiler Insurance

Insurer's Name		
Policy Number	Expiry Date month (name of), date, year	Limit of Liability (per occurrence)

Certification

The undersigned hereby certifies that:

- The policies described herein, subject to their terms, conditions, and exclusions, have been issued to the above named insured and are in force at this time.
- Coverages afforded under said policies will not be cancelled or materially changed to restrict coverage unless thirty (30) days advance written notice has been given to Town of Drumheller at the address shown on page 1 of this form and each of the policies has been endorsed to this effect.
- The undersigned is an authorized representative of each of the insurance companies listed herein, and has full knowledge of the facts set forth herein and believes them to be true.

Name of Issuing Agency			
Address of Issuing Agency			
City / Town	Province	Postal Code	Telephone No.
Name of Authorized Representative (print or type)	Signature of Authorized Representative		Date of Issue

STATUTORY DECLARATION
SUBMITED BY CONTRACTOR FOR PAYMENT

IDENTIFICATION OF AGREEMENT

Project Title:	
Contractor:	
Agreement Effective Date: (year) (month) (day)	
Town Representative:	Contractor:

IDENTIFICATION OF DECLARANT: Must Be An Authorized Representative Of The Contractor

Name of Declarant: _____

Business Address: _____

Position/Title: _____

DECLARATION OF CONTRACTOR'S REPRESENTATIVE:

I solemnly declare that, as of the date of this Statutory Declaration, I am an authorized signing officer of the Contractor named in the Agreement identified above, and as such have legal authority to bind the Contractor, and have personal knowledge that all insurance and Workers' Compensation Board premiums, accounts payable for subcontracts and related Total Costs of Material and Labour which have been incurred by the Contractor in performance of the Work pursuant to the Agreement, have been paid in full up to and including the latest Construction Period Payment received, as identified above, except for:

1. Payments deferred by agreement between the Contractor and a Subcontractor which have been reported to the Town Representative for the Town's Representative's verification and prior approval, or
2. Amounts withheld by reason of a legitimate dispute which has been identified to the relevant Party or Parties and from whom payment has been withheld including any legitimate dispute with a Subcontractor, as identified below:

_____

_____

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

The making of a false or fraudulent statutory declaration is a contravention of the Criminal Code of Canda and carries, up conviction, penalties including fines or imprisonment, or both.

_____
Signature of Declarant
Authorized Representative of the Contractor

Declared before me at _____

In the Province of _____

dated _____

_____
Signature of Notary Public or Commissioner of Oaths in and for Alberta

_____
Print Name

_____
Expiry Date of Commission

Notice of
Public Works Act Claim

Submit completed form by **"Registered Mail"** to:

Town of Drumheller
Resiliency and Flood Mitigation Office
702 Premier Way
Drumheller, Alberta, T0J 0Y0

Claimant Information

Name (legal name)				
Address				**City/Town**
Province	**Postal Code**	**Telephone**	**Fax**	**E-Mail**

Project Information

The claim is made in respect of the following pr	
Project Name:	
Town of Drumheller Contract #: (if known)	

Details of Claim

1	**Our Contract is with (name of contracting party):**	**(and Prime Contractor, if different)**

2 **This claim is made in respect of the following work (provide a short description of labour, equipment, materials, or service provided):**

3 **Time** **(work includes labour, equipment, materials or services provided)**

☐ The work related to this claim was fully performed on: _____

OR

☐ The work related to this claim is not yet fully performed but payment for work performed to: _____

has not been received as of: _____ (Today's Date)

4 **Amount**

The amount of this claim is **$** _____ which includes **$** _____ In holdback funds or n

5 **Signature**

I, the undersigned, am or represent the claimant named above and believe that the information provided is true and correct

Printed Name of Declarant _____ Signature of Declarant _____

For Owner Use Only

Contract #	Date Received	Date Filed	Date Acknowledged

ADDENDUM A-01

Project:	**Tender No. 22.06.20A - Drumheller Resiliency and Flood Mitigation – Midland Dike Upgrade Project**
Addendum:	**A-01**
Date:	
Location:	**Drumheller, Alberta**

To All Bidders:

1. General

1.1. This addendum shall be read in conjunction with the Tender No. 22.06.20A Drumheller Resiliency and Flood Mitigation – Midland Dike Upgrade Project.

1.2. Where inconsistent with the above, this addendum shall govern. This addendum forms an integral part of the Contract Documents and shall be included therein.

1.3. No consideration shall be allowed for increases (extras) to the CONTRACT PRICE due to failure of the Contractor or Subcontractor not being familiar with this addendum.

1.4. The Bidder shall insert in the Tender Form the number(s) of the addenda received by them during the tendering period and taken into account by them in preparing their tender.

1. A – Questions

End of Addendum A-01

5 SPECIAL PROVISIONS

5.1 *STANDARD SPECIFICATIONS, SPECIFICATION AMENDMENTS, SUPPLEMENTAL SPECIFICATIONS, AND TYPICAL DRAWINGS*

5.1.1 ALBERTA TRANSPORTATION NAME CHANGE

Due to government reorganization, Alberta Transportation's name has changed. As a result, some specifications, drawings, plans, and other documents in this Contract may continue to reference Alberta Infrastructure, Alberta Infrastructure and Transportation, or Alberta Transportation and Utilities. Please be advised that any references to Alberta Infrastructure, Alberta Infrastructure and Transportation, or Alberta Transportation and Utilities shall mean Alberta Transportation.

5.1.2 TOWN OF DRUMHELLER

Town of Drumheller has no name change. Town of Drumheller Resiliency and Flood Mitigation Office is referred to as "The Owner" herein.

5.1.3 STANDARD SPECIFICATIONS FOR CONSTRUCTION

The specifications for the construction work, which shall form part of the Contract Agreement, are published in the following manuals:

- Alberta Transportation, General Specifications, Specification Amendments and Supplemental Specifications for Highway and Bridge Construction – Edition 15, 2013;
- Alberta Transportation, Standard Specifications for Highway Construction;
- Alberta Transportation, Standard Specifications for Bridge Construction – Edition 16, 2017;
- Alberta Transportation, Civil Works Master Specifications for Construction of Provincial Water Management Projects, 2017; and,
- City of Calgary Standard Specifications – Erosion and Sediment Control, 2017.

Generally, and unless otherwise noted or context dictates otherwise, the following changes are to be made to the above-mentioned manuals:

- the words "Department," "Minister" or "City" shall be replaced by the word "Owner."

5.1.4 SPECIFICATION AMENDMENTS AND SUPPLEMENTAL SPECIFICATIONS

The Specification Amendments listed in the following Table are contained in the manual entitled "General Specifications, Specifications Amendments and Supplemental Specifications for Highway and Bridge Construction – Edition 15, 2013". Items that are marked with an "X" are applicable to this Contract; items that are not so marked do not apply. The Contractor is advised that the applicable Specification Amendments may contain modifications to the payment clauses for the Specifications amended.

AMENDMENTS TO SPECIFICATIONS		
SECTION 1 – GENERAL SPECIFICATIONS		
	AMC_C125.2	Priority Line Painting for Site Occupancy
	AMC_C125.3	Non-Priority Line Painting for Site Occupancy
X	AMC_S53.1	Amendment to Specification 1.2, General, Re: Construction Staking and Survey - Majority by Contractor
	AMC_S53.2	Amendment to Specification 1.2, General, Re: Construction Staking and Survey - Majority by Consultant
	AMC_S53.3	Amendment to Specification 1.2, General, Re: Construction Staking and Survey for Bridge Structures
	AMC_C230	Amendment to Specification 1.2 General, Re: Diesel Fuel Cost Adjustment
SECTION 3 – SURFACING		
X	AMC_S116	Amendment to Specifications 2.3, Grading, 3.1, Subgrade Preparation, and all Base Course Specifications, Re: Tolerances for Surface Finish
	AMC_S155	Amendments to Specification 3.50, Asphalt Concrete Pavement (EPS), Re: Hot In-Place Recycled Asphalt Pavement
	AMC_S201	Amendments to Specification 3.50, Asphalt Concrete Pavement (EPS), Re: Acceptance Testing for Contracts with Small Quantities (less than 1,000 tonnes) of Asphalt Concrete Pavement
SECTION 5 – MATERIALS		
	AMC_S9.4	Supply of Aggregate – Contractor's Supply with Option
X	AMC_S9.5	Supply of Aggregate – Contractor's Supply with No Option
	AMC_S9.6	Supply of Aggregate – Designated Source
	AMC_C218	Interim Payment for Supply of Materials
BRIDGE CONSTRUCTION SPECIFICATIONS		
	AMC_B013	Amendments to Specification 1.2 General, Re: Adjustment of Completion Date and Damages for Delay for Bridge construction work
	AMC_B010	Amendments to Specification 1.2 General, Re: Duration of Work and Site Occupancy for Bridge Construction
	AMC_B011	Lane Closure for Bridge Construction

AMENDMENTS TO SPECIFICATIONS		
	AMC_B020	Amendments to Specification 1.2 General, Re: Site Offices for Bridge Construction
	AMC_B219	Amendments to Specification 1.2 General, Re: Optional Course of Construction Insurance

5.1.5 TYPICAL PLANS AND DRAWINGS

The following additional specifications, typical plans, and drawings, which shall form part of the Contract Agreement, are for viewing and/or download from Alberta Transportation's website at the following address: www.transportation.alberta.ca:

- Typical minimum requirements for traffic accommodation and construction zone temporary signing are included in the manual entitled "Traffic Accommodation in Work Zones 2018," 2nd Edition, Date of Issue December 2018.

  It may be necessary for the Contractor to modify these drawings and/or develop new drawings to address non-typical situations when developing the Traffic Accommodation Strategy in accordance with Specification 7.1, Traffic Accommodation and Temporary Signing.
- Typical minimum requirements for erosion and sediment control devices are included in the following manuals:
  - Erosion and Sediment Control – June 2011
  - Field Guide for Erosion and Sediment Control – June 2011
- All other typical plans and drawings are included in the manual entitled "CB6 Highway Standard Plates," revised July 2015.

Hardcopy versions of select manuals are available for purchase from Alberta Transportation, Strategic Procurement Branch, Suite 310, 3rd Floor, Twin Atria Building, 4999 – 98 Ave., Edmonton, AB, Telephone: (780) 415-1068.

Proponents are advised that, from time to time, Alberta Transportation may issue revisions to existing drawings, and/or may insert drawings into the above mentioned manuals without re-printing hardcopy editions of the manuals. These new and/or revised drawings will be available on Alberta Transportation's website.

Proponents are further advised that any drawing revisions and/or new drawings posted on Alberta Transportation's website, as of five (5) calendar days prior to the date set for the opening of Tenders, will apply to this Contract.

Any standard drawings that are not available on Alberta Transportation's website will be included in the Contract Documents.

5.2 *CONTRACT INFORMATION DOCUMENTS*

Contract Information Documents including, but not limited to, geotechnical reports, miscellaneous documents, and reference drawings that may have been provided to the Contractor

or made available to the Contractor for viewing during the tender period, shall not be considered part of the Contract Documents.

The Contractor is not entitled to rely upon the factual information or factual data in any Contract Information Document, nor any opinions or interpretations contained therein. Contract Information Documents shall not be considered accurate, complete or appropriate, and are made available solely for the purpose of providing the Proponent with access to the information available to the Owner.

5.3 *STANDARD DRAWINGS*

In addition to the standard drawings referenced in the specifications, the following standard drawings shall apply:

SOURCE	DRAWING NO.	DESCRIPTION
City of Calgary	15	Erosion Control – Block and Gravel Inlet Sediment Barrier
City of Calgary	16	Erosion Control – Silt Fence Sediment Barrier

5.4 *CONSULTANT*

The Consultant for this project is:

Klohn Crippen Berger Ltd.
500 – 2618 Hopewell Place NE
Calgary, AB T1Y 7J7

5.5 *MODIFICATIONS TO SCOPE OF WORK*

The Owner shall be entitled to increase or reduce the Scope of Work due to budgetary constraints or for any reason whatsoever upon the Owner providing written notice to the successful Contractor. If this is necessary, the actual type of work acceptably completed will be paid at the applicable prices bid shown in the Unit Price Schedule.

5.6 *SCOPE OF WORK*

The Scope of Work for this project shall include, but is not limited to, the following:

- Raising of existing Midland Dike crest by approximately 0.4 to 0.5 m, widening of crest to 4 m.
- Installation of cross-drain and storm sewer infrastructure, including associated appurtenances and restoration of pavement, curb, gutter, and sidewalk.
- Placement of instream riprap protection in the Red Deer River.
- Site stabilization, revegetation and clean up.
- Other work.

Unless otherwise specified, the Contractor shall supply all materials necessary to complete the Work. A complete job is called for, therefore any labour, material, equipment, tool or incidental

item not specifically mentioned but necessary for completeness will be considered incidental to the Work and no separate or additional payment will be made.

5.7 *RIGHT OF WAY RESTRICTIONS*

Prior to the commencement of his or her operations, the Contactor shall consult with the Consultant to determine the location of properties with construction restrictions and conduct his or her operations accordingly.

The following properties currently have construction restrictions:

- 102 15th Street NW, Drumheller, AB, T3Z 3M3
- 1201 1 Avenue Northwest, Drumheller, AB, T0J 0Y1
- 1215 1 Avenue Northwest, Drumheller, AB, T0J 0Y1

If the restricted properties are still not available by the time the contractor has completed all other work, The Owner reserves the right to either:

- Modify the design and construction as required;
- Delete the affected portion of the work from the Contract.

All work items actually completed will be paid for at the applicable contact unit prices. No separate or additional payment will be made as a result of any alteration or elimination of original contract quantities.

5.8 *PROJECT SCHEDULING AND COMPLETION*

The Contractor shall schedule his or her operations to complete all of the work under this Contract by May 15, 2023.

5.9 *WORKING HOURS*

Contractor shall adhere to Town of Drumheller Community Standards Bylaw No. 16-10 for working hours.

The Contractor shall abide by all Federal, Provincial, and Town of Drumheller regulations regarding the noise level generated by the Contractor's operations or equipment.

5.10 *PROJECT INTERIM COMPLETION DATES*

The Contractor will be subject to the following interim completion dates:

PROJECT COMPONENT	**INTERIM COMPLETION DATE**
Instream Work	October 15, 2022
Mobilization to Site	September 1, 2022
Fill Placement complete	October 15, 2022
Live Cuttings, Topsoil Placement and Seeding complete	November 15, 2022 (prior to snow cover)

Project complete	May 15, 2023

Where the interim completion date shown above is stated as the number of calendar days rather than a specified date, the Contractor shall schedule his or her activities to ensure work within the specified project component is completed within the specified number of calendar days.

General Specification 1.2.19, "Adjustment of Completion Dates" and General Specification 1.2.20, "Failure to Complete on Time" will apply to all interim completion dates.

5.11 *CONTRACTOR'S WARRANTY AND FINAL ACCEPTANCE:*

The following Special Provision replaces General Specification 1.2.53 Contractor's Warranty and Final Acceptance in its entirety:

During the warranty period, the Contractor shall warrant the Work to be free from any defect or failure and to withstand climatic, maintenance and normal operational conditions. The Warranty period shall be **two (2) years** and shall commence on the date of the Construction Completion as determined by the Owner.

Work requiring warranty periods different from above will be identified in the Special Provisions.

The Contractor shall repair, at his or her own expense, any such defect or failure which occurs in the Work prior to the expiry of the warranty period. The Owner will notify the contractor, in writing, of repairs required during the warranty period; and the Contractor shall promptly make the necessary repairs.

If the Contractor fails to carry out repairs promptly or to the satisfaction of the Owner, the Owner may then make other arrangements to have the repairs done, the cost of which shall be debt due and owing by the Contractor and the Surety to the Owner.

Contrary to Specification 2.20, Seeding, the warranty period shall be two (2) years and shall commence on the date of the Construction completion, as determined by the Owner.

Upon completion of all above requirements, a Final Acceptance Certificate will be issued by the Consultant on behalf of the Owner.

5.12 *RESTRICTED ACTIVITY PERIOD*

The Contactor shall be aware of the following Restricted Activity Period (RAP) for the Red Deer River, as they are classified as Class C Water Bodies:

- Red Deer River:

  April 16 to June 30, annually

The information above is based on Alberta Environment and Parks' *Code of Practice for Watercourse Crossings* Calgary Management Area Map – Dated November 2012.

The installation of isolations is not permitted during the Restricted Activity Periods on the Red Deer River. Additionally, all isolations must be removed prior to April 16 each year before the spring freshet, per the *Water Act* approval.

5.13 *PROPONENT'S INVESTIGATION*

The Proponent is responsible for examining the Plans, Specifications, Tender and Contract forms and to carefully investigate and satisfy itself of every condition affecting the Projects and Site including, but not limited to, the site conditions, and the Work to be provided. The contractor acknowledges and agrees that its submission of a tender is conclusive evidence that the Contractor made such investigation and that whether or not it has so investigated, it is willing to assume and does assume all risk regarding conditions affecting the Project and the Site.

The Contractor acknowledges and agrees that any information pertaining to subsurface soil, rock and groundwater conditions on the borehole/testpit logs or report shown on the drawings has been obtained for design purposes and is valid only at the specific locations of the boreholes/testpit logs or report and on the date that the subsurface investigations took place. Proponents may wish to supplement this information, for their purposes, by performing additional investigations.

5.14 *DIFFERING CONDITIONS*

If, during the execution of the Work, the Contractor encounters surface or subsurface conditions, not resulting from inclement weather or seasonal river elevation differentiation or flow volume or groundwater conditions, which meet all of the following requirements;

- differ substantially from those indicated in the Contract Documents;
- differ materially from those ordinarily found and generally recognized as inherent in construction activities of the character provided in the Contract Documents;
- could not have been reasonably discovered during the Proponent's investigation of the Site in accordance with Special Provision, Proponent's Investigation;
- were not foreseeable by a reasonably experienced Contractor; and
- are not expressly dealt with elsewhere in the Contract,

then the Contractor must notify the Consultant and Owner promptly, before such conditions are disturbed, if possible. In any event the Contractor must give written notice to the Consultant and Owner within 7 calendar days after first observance of the conditions. On receipt of such notice from the Contractor, the Consultant will promptly investigate such conditions. Failure to provide written notice within the prescribed time period will preclude the Contractor from proceeding under this section.

If the Consultant or Owner notice potential differing conditions, the Consultant will give notice to the Contractor that Consultant will investigate such conditions.

If as a result of the Consultant's investigation, the Consultant determines that a differing condition exists, which would cause or result in an increase or decrease to the scope of the Work, the cost to be incurred by the Contractor, or in the time required to perform the Work, then the Consultant may recommend to the Owner for the Owner's consideration, one or more of the following:

- provide instruction to the Contractor on how to proceed including, but not limited to, removing all or a portion of the Work, revisiting all or a portion of the Work, or continuing the Work as set out in the Contract.
- adjust one or more of the following:

- Construction Completion Dates
- Site Occupancy Days; or

- Adjust the amount of payment for the Work in accordance with Contract including, if applicable Section 1.2.25, Extra Work, or reduce the amount to be paid under the Contract. Additional costs will be based on unit rates as set out in the Contract, or as negotiated as appropriate.

The Contractor may pursue the matter further through the process detailed in Section 1.2.54, Claims and Dispute Resolution if:

- The Consultant determines that a differing condition does not exist; or,
- The Consultant determines that a differing condition exists but the Contractor believes the Consultant's instructions or adjustments are inconsistent with the intent or scope of the Contact, or are given in error. Then the Contractor must give notice to the Consultant and proceed to carry out the instructions.

Upon encountering differing surface or sub-surface conditions, the Contractor is responsible for implementing measures to reduce impacts related to these conditions. The Contractor is not entitled to payment for that portion of costs incurred which could have been reasonably avoided by the Contractor.

5.15 *HAUL ROUTE INFORMATION*

Hauling of all materials shall be in accordance with Specifications 4.5, Hauling of the Standard Specifications for Highway Construction and the Provisions contained herein.

For information and requirements of local haul routes the Contractor shall contact the following:

- Information on local Town of Drumheller road bans can be obtained by calling Roadata Services at 1-888-830-7623

5.16 *ROAD RESTRICTIONS / ROAD BANS*

The Contractor is advised that all Alberta Transportation provincial road restrictions / road bans and Town of Drumheller local road restrictions / road bans on hauls roads to and from the project shall be enforced in accordance with Specification 4.5, Hauling of the Standard Specifications for Highway Construction and Provisions contained herein. No extra payment will be made for hauling of materials under road ban conditions.

Information on provincial Alberta Transportation road bans can be obtaining by call 1-855-762-3226 or by visiting Alberta Transportation's web site at www.alberta.ca/road-restrictions-and-bans-overview.aspx

Information on local Town of Drumheller road bans can be obtained by calling Roadata Services at 1-888-830-7623

5.17 *SITE ACCESS PADS*

Site access pads shall be constructed at all entrances and exit points to the construction areas, or as designated by the Consultant, to prevent the tracking of mud and dirt onto existing roads.

The access pads shall be a minimum of 15 metres long and wide enough to remove the mud and dirt from the vehicle tires. The access pad shall be a minimum of 200 mm thick and be constructed of uniformly sized drain or crush rock.

The Contractor shall remove all sediment, dirt, dust and mud deposited on existing roads at the end of each work day, or as often as necessary to keep roadways clear. When muddy conditions exist, all vehicle tires shall be sprayed clean of all debris in a designated area to contain sediment prior to entering the public roadway.

Sediment that poses a hazard to vehicle or pedestrian traffic on the roadway, as determined by the Consultant, shall be removed immediately.

The construction, maintenance and removal of site access pads, washing of tires, and removal of sediment, dirt, and mud from roadway will be considered incidental to the Work and no separate or additional payment will be made.

5.18 *TEMPORARY CONSTRUCTION ACCESS ROAD*

The construction, maintenance and removal of site access pads, washing of tires, and removal of sediment, dirt, and mud from the roadway will be considered incidental to the Work and no separate or additional payment will be made.

At the completion of the project, or as deemed required by the Consultant, the Contractor shall complete a site restoration to return the disturbed areas to a condition equal to or better than prior to work starting. The Contractor will be paid under applicable bid items necessary to complete the work. The Consultant will have the final decision on what type of work is to be completed. The following bid items may be applicable: "Common Excavation – Waste", "Borrow Excavation – Contractor Supply", "Hydroseeding", and "Topsoil Supply".

Temporary construction access roads may be terminated at any time by the Consultant if, in the opinion of the Consultant, the Contractor is mistreating the intent of the temporary access roads.

The Contractor shall have no claim against the Owner for any adjustment, including termination to temporary construction access road prior to starting or during construction. No additional compensation will be paid by the Owner for any delay, inconvenience or damage sustained by the Contractor which is caused by the adjustment or termination of any temporary access roads.

5.19 *PROJECT SITE OFFICE*

In addition to the requirements of General Specification 01520, Construction Facilities, Clause 1.2 Site Office, the Contractor shall provide a site office for the entire project duration. The Contractor shall be responsible for all utilities, upkeep, and maintenance of the project site office as well as providing all weather access and parking facilities.

5.20 *PROGRESS AND MILESTONE CONSTRUCTION MEETINGS:*

The Contractor is responsible for hosting construction progress and milestone meetings at its site office or at a location determined by the Consultant. All attendees identified as necessary by the Consultant must be in attendance. The frequency, date and agendas for the meetings will be determined by the Consultant.

The following, but not limited to, shall be considered as Milestone Meetings:

- General Pre-Construction Meeting (1 week prior to start)
- Weekly construction meetings
- Substantial completion meeting

All meetings will be considered incidental to the Work and no separate or additional payment will be made.

5.21 *PROJECT IDENTIFICATION / GRANT SIGNS*

The Contractor shall be required to install one (1) Project Identification / Grant Signs, supplied by the Owner. This sign shall be located at a key point within the Town of Drumheller for public awareness and information, as directed by the Consultant, and shall remain in place for the duration of construction.

Plywood edges must be sealed. All edges, front and back are to be primed using high quality exterior primer and one coat of green (Pantone 349c) exterior enamel paint. Reflective sheeting (ASTM D 4956-01 – Type 1) is to be added to the information panel area prior to adding textual information.

The sign shall be fabricated using aluminum or exterior 12 mm MDO plywood (crezan), and installed using 100 mm x 150 mm wooden posts. Sign shall be installed minimum 1.50 m above natural ground measured to the bottom of sign board.

Sign Placement, installation and maintenance shall be in accordance with Standard Specification 7.1, Traffic Accommodation and Temporary Signing".

The installation of the project identification / grant sign will be considered incidental to the work and no separate payment will be made.

5.22 *CONSTRUCTION ADVISORY SIGNS*

The Contractor shall be required to supply and install one (1) Construction Advisory Signs. This sign shall be located at a key point within the Town of Drumheller for public awareness and information as directed by the Consultant. The Construction Advisory Sign shall include the name of the project and contact information for the Contractor and Town of Drumheller. The sign shall be installed three (3) weeks prior to Construction start-up at a location as directed by the Consultant and shall remain in place for the duration of construction.

Plywood edges must be sealed. All edges, front and back are to be primed using high quality exterior primer and one coat of green (Pantone 349c) exterior enamel paint. Reflective sheeting (ASTM D 4956-01 – Type 1) is to be added to the information panel area prior to adding textual information.

The sign shall be fabricated using aluminum or exterior 12 mm MDO plywood (crezan), and installed using 100 mm x 150 mm wooden posts. Sign shall be installed minimum 1.50 m above natural ground measured to the bottom of sign board.

The Contractor shall be responsible for the design and fabrications of the Construction Advisory Signs. All drawings shall be stamped and signed by a Professional Engineer registered in the

Province of Alberta. One (1) copy of the general sign layout and associated shop drawings shall be submitted to the Consultant for review a minimum of two (2) weeks in advance of scheduled fabrication.

Sign Placement, installation and maintenance shall be in accordance with Standard Specification 7.1, Traffic Accommodation and Temporary Signing".

Contractor shall be fully responsible for the posting of a 24-hour telephone contact number for public information. The telephone number and sign lettering shall be of sufficient size to permit reading while travelling at 50 km/hr (ie. For Construction Information Call 403-823-0994).

There will be no separate or additional payment for all costs associated with the Public Information call number and shall be considered incidental to Work.

The installation of the project identification / grant sign will be considered incidental to the work and no separate payment will be made.

5.23 *PUBLIC NOTIFICATION – ELECTRONIC MESSAGE BOARDS*

Public Notification – Electronic Message Boards not required for this contract.

5.24 *PUBLIC NOTIFICATION – BUSINESS OWNERS*

The Contractor shall submit a detailed schedule (i.e., Gantt Chart) outlining the work and timeline to complete the work within the project limits.

The Contractor shall maintain close contact with each affected land owner, via the Consultant, with respect to schedule and shall ensure the schedule is updated on weekly basis, or as directed by the Consultant.

5.25 *SURVEY BY OWNER'S REPRESENTATIVE*

In addition to Alberta Transportation's General Specifications for Highway and Bridge Construction, Specification 1.2.31 Stakes, Marks, and Engineering Test and AMC_S53.2, the Owner's Representative will perform the following survey work:

- Checks for Measurement for Payment for earthwork quantities.

5.26 *WORK IN THE VICINITY OF UTILITIES*

The Contractor shall be advised that there are utilities in the vicinity of the Midland Dike upgrade work. The Contractor shall arrange for locating utilities where required. The Contractor will be responsible for and will conduct his or her work in such a manner as to safeguard all communication / telephone lines, power lines, gas lines, water lines, sanitary lines, and oil pipelines within the limits of this project. It is also the Contractor's responsibility to maintain liaison with the utility owners and take all other precautions to maintain the utility services.

There will be no separate payment for locating and protection of utilities; all costs associated with this work shall be considered incidental to this Contract.

ATCO ELECTRIC Phone No.: 1-800-668-5506

Mr. Greg Smith, Operation Supervisor
Atco Electric
610-12 Street S.W.
Drumheller, AB T0J 0Y0
Email: greg.smith@atco.com
Phone: 403 820-7503
Cell: 403 820-3593

TELUS Phone No.: 587-876-0715

Mr. Roger Medavarapu, Area Manager
Drumheller, AB T0J 0Y0
Email: roger.medavarapu@telus.com

APEX UTILITIES

Apex Utilities Phone No.: 1-866-222-2067
Email: customercare@apexutilities.com

TOWN OF DRUMHELLER Phone No.: 403-823-1351

Mr. Kevin Blanchett, Operations Manager
702 Premier Way
Drumheller, AB T0J 0Y0
Email:

The Contractor shall not have any claim for compensation or damages against the Owner for any stoppage, delays, inconvenience, or damages sustained by him due to any interference to the presence, adjustment, obtaining crossing agreements, or any coordination with any utility.

5.27 *ENVIRONMENTAL CONTROL*

5.27.1 CONTROL OF EQUIPMENT

The Contractor shall carefully control all equipment and work operations so that his or her operations do not extend beyond the designated working limits unless otherwise specifically authorized by the Consultant.

5.27.2 BURNING

Under no circumstances will burning be permitted within the project limits.

5.27.3 HISTORICAL RESOURCES

Pursuant to Section 31 of the *Historical Resources Act*, should any paleontological or historical resources be discovered during the conduct of construction activities, the Consultant is to be informed immediately. Pursuant to information from the appropriate governing body, it may be necessary for the Owner to issue further instructions regarding the documentation of these resources.

5.28 ENVIRONMENTAL INFORMATION

The following environmental information is available for this tender:

- Applied Aquatic Research Ltd., 2021 (1). Fall Riverine Habitat Inventory of the Red Deer and Rosebud Rivers – Resiliency and Flood Mitigation Program. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, January 2021.
- Applied Aquatic Research Ltd., 2021 (2). Fall Vegetation Survey Report – Resiliency and Flood Mitigation Program. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, January 2021.
- Applied Aquatic Research Ltd., 2021 (3). Fall Wildlife Habitat Inventory – Resiliency and Flood Mitigation Program. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, January 2021.

The above documents may be accessed from: https://floodreadiness.drumheller.ca/be-informed/resources/drumheller-resiliency-and-flood-mitigation-office

The Contractor shall contact Alberta Environment and Parks (AEP) and inform the Consultant should an animal denning site, raptor nest or injured wildlife be found at any time during construction. The Contractor is advised that if any sensitive species are located that, dependent on the species, the work in the vicinity of the nest will be restricted.

The Contractor shall stockpile all topsoil materials at least twenty (20) metres from the watercourse and provide suitable erosion and sedimentation control measures.

5.29 ECO PLAN

The Contractor shall prepare and implement an project and site-specific Environmental Construction Operations (ECO) Plan in accordance with the Environmental Construction Operations (ECO) Plan Framework Municipal Version 2020 edition (available at *https://www.calgary.ca/uep/esm/contractor-environmental-responsibilities/eco-plans.html*) except for Section 2.3 Erosion and Sediment Control and Section 2.4 Municipal Tree Protection. The contractor's ECO Plan shall incorporate a Siltation and Erosion Control Plan (SECP) that includes site specific details of implementation and maintenance of erosion control measures.

The Contractor shall incorporate all Regulatory Approval conditions into the ECO Plan. The Contractor shall submit the ECO Plan to the Consultant seven (7) calendar days prior to the Pre-Construction Meeting for comments.

The recommended environmental protection plan measures outlined below are intended to form part of the ECO Plan that will be designed and implemented to protect the aquatic environment during construction and throughout the post-construction period. These measures would be intended to ensure compliance with the Federal *Fisheries Act* and prevent the harmful, alteration, disruption and destruction of fish habitat. Nothing in this Special Provision shall waive the Contractor's responsibility for Environmental Management in accordance with General Specification 1.2.50. The Contractor shall minimize siltation of the water body resulting from the construction of the Works.

Construction area boundaries and areas of concern shall be marked with conspicuous

flagging tape to ensure public awareness as well as to remind construction personnel that the site is a sensitive area which shall not be disturbed beyond necessity. All individuals on site shall be orientated with respect to environmental protection measures.

5.30 *ENVIRONMENTAL PROTECTION DEVICES OR PROCEDURES*

General Specification 1.2.50.3.3 Maintenance of Environmental Protection Devices, is revised as follows:

Delete the last paragraph and replace with the following:

Payment for maintaining temporary and permanent erosion control devices, including the removal and deposing of silt from containment ponds, sediment barriers or other temporary sediment erosion control products, until the Construction Completion is issued by the Consultant, will be considered incidental to the Work, and no separate or additional payment will made.

5.31 *VIBRATION MONITORING*

The Contractor shall cooperate with The Owner to facilitate vibration monitoring during the Work. Should the Owner note that vibration is becoming an issue near buildings and structures, the Owner may direct the Contractor to use less vibratory effort for fill placement and compaction, to mitigate impacts to adjacent infrastructure.

5.32 *DIESEL FUEL COST ADJUSTMENT*

5.32.1 GENERAL

.1 The Owner will make adjustments to the monthly progress payments due to the Contractor when the Owner determines that the Monthly Price Index for low sulphur diesel fuel has increased or decreased in excess of 15% of the Base Price Index.

.2 The Monthly Price Index will be published on the Government of Alberta web site https://www.alberta.ca/unit-prices-and-cost-adjustments.aspx .

.3 This section only applies to low sulphur diesel fuel, for the category of Work and at the consumption rates specified herein.

.4 The Base Price Index that applies to the Contract is **$ 145.31**.

5.32.2 DEFINITIONS

.1 Monthly Price Index (MPI):

The Monthly Price Index will be based on the average Edmonton and Calgary Rack Rates for low sulphur diesel as published by the Oil Price Information Service (OPIS). The MPI will be calculated as the average of the first 3 Mondays of each month. New MPI's will be established each month by the Owner. In the event of a statutory holiday, the Rack Rate from the next working day will be used to determine the MPI.

.2 Base Price Index (BPI):

The Base Price Index specified for this Contract will be the most current MPI, as

determined solely by the Owner, prior to the initial tender advertising date.

.3 Monthly Diesel Price Index (MDPI):

The Monthly Diesel Price Index is the MPI published by the Owner for the month in which Work is performed. The MDPI will be effective from the 26th day of the previous month to the 25th day of the current month.

5.32.3 DIESEL FUEL CONSUMPTION RATES

.1 For the purpose of the diesel fuel cost adjustment, the following category of Work and diesel fuel consumption rate will be used:

Category of Work	Diesel Fuel Consumption Rate (CR) (1)
Clearing and Grubbing, Topsoil and Subsoil Stripping, Excavation, Impervious Fill Zone 1A, Bedding 5B, Riprap (all classes)	1.6 litres/m^3

Note 1: The specified consumption rates include overhaul and truck haul. No adjustments to the specified consumption rates will be made for Contractor's choice of equipment, type of fuel, construction methodologies, efficiencies, or haul distances. No diesel fuel price adjustments will be made to Lump Sum Items.

5.32.4 CALCULATION OF DIESEL FUEL COST ADJUSTMENT

.1 The Owner will calculate the diesel fuel cost adjustment for the months in which the specified category Work is performed.

.2 The Owner will compute the ratio of Monthly Diesel Price Index / Base Price Index each month the specified category of Work is performed. If the ratio falls between 0.85 and 1.15, inclusive, no fuel cost adjustment will be made for that month. If the ratio is less than 0.85 a credit to the Owner will be computed. If the ratio is greater than 1.15 additional payment to the Contractor will be computed. Diesel Fuel Cost Adjustments will be computed as follows:

.1 Diesel Fuel Price Decrease: When the MDPI is less than 85% of the Base Price Index, a diesel fuel de-escalation assessment will be calculated. This assessment will be deducted from any monies due the Contractor on the monthly progress payment.

P.R. = (0.85 - (MDPI / BPI)) x (Q) x (BPI) x

(CR) where:

P.R. = Price Rebate

Q = the monthly quantity of the specified category of Work performed, as determined by the Owner and as reported on the monthly progress estimate

CR = the diesel fuel consumption rate for the specified category of Work.

.2 Diesel Fuel Price Increase: When the MDPI is more than 115% of the Base Price Index, a diesel fuel escalation assessment will be calculated. This assessment will be added to any monies due the Contractor on the monthly progress payment.

P.I. = ((MDPI / BPI) - 1.15) x (Q) x (BPI) x

(CR) where:

P.I. = Price Increase

Q = the monthly quantity of the specified category of Work performed, as determined by the Owner and as reported on the monthly progress estimate

CR = the diesel fuel consumption rate for the specified category of Work.

.3 The Price Rebate or Price Increase will be authorized by means of a Change Order.

5.32.5 CONTRACTOR'S OPTION TO PARTICIPATE

.1 The Contractor shall have the option to participate or opt-out of the Minister's diesel fuel cost adjustment process.

.2 If the Contractor wishes to opt-out of the Owner's diesel fuel cost adjustment process, the Contractor shall state its intent in writing to the Owner prior to execution of the Contract.

.3 If the Contractor does not state its intent in writing to the Owner prior to execution of the Contract, the Owner will deem that the Contractor's intent was to participate in the diesel fuel cost adjustment process and no further changes will be considered.

.4 The Contractor will not be permitted to either opt-in or opt-out of the diesel fuel cost adjustment process after the Owner's execution of the Contract.

5.32.6 CONCLUSION OF DIESEL FUEL COST ADJUSTMENT

.1 The calculation of Price Rebates and Price Increases on diesel fuel costs will only be considered for the category of Work specified and performed prior to the date of Substantial Performance of the Work.

.2 For any of the category of Work specified and performed after the date of Substantial Performance of the Work, the Owner will process payments without applying any diesel fuel cost adjustments.

5.32.7 FINAL PAYMENTS

.1 If the Contractor fulfills the prerequisites to Substantial Performance by the specified date, the Owner will determine the difference between the cumulative monthly

estimated quantities for the category of Work specified and the final quantities for that same Work. An average Monthly Diesel Price Index will be calculated by averaging the Monthly Diesel Price Indexes for all months in which the category of Work specified was performed. This average Monthly Diesel Price Index will be applied to the quantity differences for such work.

.2 If the Contractor does not fulfill the prerequisites to Substantial Performance by the specified date, diesel fuel price adjustments will not be applied to any difference between the estimated and final quantities of the category of Work specified.

6 SPECIFICATION AMENDMENTS

The work of this contract is covered by the following specifications, prepared based on Alberta Transportation's Civil Works Master Specifications for construction of water management projects.

DIVISION 01 – GENERAL REQUIREMENTS		
	01110	Summary of the Work
	01275	Measurement Rules
	01280	Measurement Schedule
	01321	Construction Schedule
	01330	Submittals
	01390	ECO Plan
	01391	Environmental Protection
	01410	Regulatory Requirements
	01411	Work Site Safety
	01452	Quality Control and Quality Assurance
	01510	Existing and Temporary Utilities
	01520	Construction Facilities
	01552	Existing and Temporary Roads
	01601	Products and Execution
	01621	Product Options and Substitutions

	01722	Site Surveying
	01742	Final Clean-up
	01775	Contract Acceptance Procedures
	01785	Contract Record Drawings
DIVISION 02 - SITEWORK		
	02220	Demolition, Salvage and Removal
	02232	Site Clearing and Grubbing
	02234	Topsoil and Subsoil Stripping
	02240	Care of Water
	02242	Turbidity Barriers and Monitoring
	02244	Fish Capture and Release
	02315	Excavation
	02330	Earthwork Materials
	02331	Fill Placement
	02342	Geotextile
	02373	Riprap and Bedding Placement
	02613	Precast Concrete Manhole
	02615	PVC Pipe
	02617	Precast Concrete Pipe
	02910	Topsoil and Subsoil Placement
	02915	Hydroseeding
	02916	Landscape Maintenance

	02950	Live Cuttings
DIVISION 03- CONCRETE		
	03400	Precast Concrete Structures
DIVISION 03- METALS		
	05505	Metal Fabrications
DIVISION 11- EQUIPMENT		
	11280	Medium Duty Slide Gates
	11282	Backflow Prevention Valves

7 PLANS

The following drawings dated June 17, 2022 form part of the Contract Documents.

G-001 Midland Project Cover Sheet, Location Plan and Drawing Index

G-002 Midland Project Legend, Notes and Survey Control

C-101 Midland Project General Arrangement Plan and Project Site Limits

C-102 Midland Project Upstream Plan and Profile Sta 1+000 to Sta 1+250

C-103 Midland Project Upstream Plan and Profile Sta 1+250 to Sta 1+500

C-104 Midland Project Downstream Plan and Profile Sta 2+000 to Sta 2+406

C-105 Midland Project Downstream Plan and Profile Sta 2+406 to Sta 2+782

C-301 Midland Project Upstream Sections 1 of 2

C-302 Midland Project Upstream Sections 2 of 2

C-303 Midland Project Downstream Sections 1 of 2

C-304 Midland Project Downstream Sections 2 of 2

C-401 Crossdrain B-1 Plan and Profile

C-402 Midland Downstream Overland Flow Scape Route B-1 Plan and Profile

C-403 Midland Downstream Storm Crossdrain B-11 Plan and Profile

C-404 Midland Downstream Storm Crossdrain B-12 Plan and Profile

C-405 Midland Downstream Storm Crossdrain B-13 Plan and Profile

C-406 Midland Downstream Overland Flow Scape Route B-14 Plan and Profile

C-407 Midland Downstream Overland Flow Scape Route B-15 Plan and Profile

C-408 Midland Downstream Overland Flow Scape Route B-15A Plan and Profile

C-409 Midland Downstream Storm Crossdrain B-17 Plan and Profile

C-501 Upstream Proposed Instream Riprap Protection Plan and Section

C-502 Midland Project Typical Cross Section

8 ENVIRONMENT PERMITS AND AUTHORIZATIONS

The following lists related permits and authorizations for the Midland Dike Upgrades Project work:

- First Nations Consultation FCN # FNC202006286 – granted sufficiency in January 2021
- The HRA Requirements were provided to the DRFMO in October 2020 (HRA Number: 4956-20-0069-001). Further work required includes a Historic Resources Impact Assessment (HRIA) by a qualified archeologist.
- Alberta Environment – Water Act - TBD
- Fisheries and Oceans Canada – TBD
- Transport Canada (Navigable Waters) – TBD

9 ADDENDA

(Attach addenda, if any, behind this page.)

10 AGREEMENT

This Agreement made on the _____ day of _____ in the year **Two Thousand Twenty Two**

by and between **Town of Drumheller**
hereinafter called the **"Owner"**

and
hereinafter called the **"Contractor"**

witnesses that the parties agree as follows:

10.1 *ARTICLE A-1 THE WORK*

The Contractor shall:

Perform the Work required by the Contract Documents for **Town of Drumheller Resiliency and Flood Mitigation** which have been signed by the parties, and which were prepared by **Klohn Crippen Berger Ltd.**

(a) Acting as and hereinafter called **"Consultant"** and

(b) Do and fulfill everything indicated by this Agreement, and

(c) Attain Final Acceptance of the Work, as certified by the Consultant, by the **15th day of May 2023.**

10.2 *ARTICLE A-2 CONTRACT DOCUMENTS*

The following is an exact list of the Contract Documents referred to in Article A-1 of this Agreement and as defined in item 1.1.4 of DEFINITIONS. This list is subject to subsequent amendments in accordance with the provisions of the Contract and agreed upon between the parties.

1. Instructions to Proponents
2. Tender Forms
3. Tender Amendment Forms
4. Special Provisions
5. Specification Amendments
6. Supplemental Specifications
7. Plans
8. Environmental Permits and Authorizations
9. Addenda
10. Agreement

10.3 *ARTICLE A-3 CONTRACT PRICE*

The quantities shown in the Unit Price Schedule are estimated. The Contract Price shall be the final sum of the products of the actual quantities that are incorporated in, or made necessary by the Work, as confirmed by count and measurement, and the appropriate Contract Unit Prices, together with any adjustments that are made in accordance with the provisions of the Contract Documents.

(a) The Estimated Contract Price shall be the sum of the products of the estimated quantities and the appropriate Contract Unit Prices in the Schedule.

(b) See Unit Price Schedule in the Tender Form.

10.4 *ARTICLE A-4 PAYMENT*

(a) The Owner shall pay the Contractor in Canadian Funds for the performance of the Contract, the amounts being determined by actual measured quantities of the individual work items contained in the Unit Price Schedule in Article A-3(c) of this Agreement, and measured in accordance with the methods of measurement given in the specifications.

(b) Subject to applicable legislation and the provisions of the Contract Documents, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a **10% holdback**, the Owner shall:

(1) Make progress payments to the Contractor on account of the work performed as certified by the Consultant, which will become due and payable 45 days following the cut-off date of the progress certificate, (which unless agreed to differently, will be the 25th day of the month), and

(2) Upon Final Construction Acceptance of the Work as certified by the Consultant pay to the Contractor the unpaid balance of holdback monies then due, and

(3) Upon termination of the warranty period as certified by the Consultant pay to the Contractor the unpaid balance of monies then due.

(c) If the Owner fails to make payments to the Contractor as they become due under the terms of this Contract or in an award by arbitration or court, interest of **three percent (3%)** per annum on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

10.5 *ARTICLE A-5 RIGHTS AND REMEDIES*

(a) 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.

(b) No action or failure to act by the Owner, Consultant 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.

10.6 *ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES*

Communications in writing between the parties or between them and the Consultant shall be considered to have been received by the addressee on the date of delivery if delivered by hand to the individual or to a member of the firm or to an officer of the corporation for whom they are intended or if sent by post or by telegram, to have been delivered within five (5) working days of the date of mailing, dispatch or of delivery to the telegraph company when addressed as follows:

The Owner at **Deighen Blakely, P. Eng., Program Director**
Drumheller Resiliency and Flood Mitigation Office
224 Centre Street
Drumheller AB T0J 0Y4

The Contractor at

The Consultant at **Rob Cheetham, P. Eng., Project Manager**
Klohn Crippen Berger Ltd.
500 – 2618 Hopewell Place NE
Calgary, Alberta T1Y 7J7

10.7 *ARTICLE A-7 LAW OF THE CONTRACT*

The law of the Place of the Work shall govern the interpretation of the Contract.

10.8 *ARTICLE A-8 LANGUAGE OF THE CONTRACT*

This Agreement is drawn in English at the request of all parties hereto; ce marche est redige en anglais a la demande de toutes les parties.

10.9 *ARTICLE A-9 SUCCESSION*

The General Specifications of the Contract, and the other aforesaid 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 assigns.

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

SIGNED, SEALED AND DELIVERED
in the presence of:

OWNER

TOWN OF DRUMHELLER

Name

Signature

print name and title

Signature	**Witness**
print name and title	**print name and title**

Date

CONTRACTOR

Name

Signature	**Witness**
print name and title	**print name and title**

Date

N.B. Where legal jurisdiction, local practice, or Owner or Contractor requirement calls for proof of authority to execute this document, proof of such authority in the form of a certified copy of a resolution naming the person or persons in question as authorized to sign the Agreement for and on behalf of the corporation or partnership, parties to this Agreement, should be attached.

2.0 GENERAL

2.1 WORK OF THE PROJECT

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

.1 DRUMHELLER RESILIENCY AND FLOOD MITIGATION

.2 Work of the Project is being carried out utilizing multiple contracts.

.3 Work of the Project has been divided into the following major contract packages:

.1 Package 1 for Midland Dike Upgrades for the Town of Drumheller. Anticipated construction: August, 2022 to May 2023.

.2 Package 2 for Newcastle Dike Upgrades for the Town of Drumheller. Anticipated construction: August, 2022 to May 2023.

.3 Package 3 for Dike C Dike Upgrades for the Town of Drumheller. Anticipated construction: August, 2022 to May 2023.

.4 Package 2 for Willow Estates Dike Upgrades for the Town of Drumheller. Anticipated construction: August, 2022 to May 2023.

.4 The Owner may subdivide, consolidate, add to, or otherwise modify the above contract packages.

.5 Allow other Contractors every opportunity to introduce and store their materials or products.

.6 Co-ordinate and connect the Work of this Contract to accommodate the work of Other Contractors.

2.2 WORK OF THIS CONTRACT

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

.1 Raising a length of approximately 0.5 metres of earthen flood protection dike on the north bank of the Red Deer River in the neighborhood of Midland.

.2 Constructing a 225 metre long extension of earthen dike, immediately west of 25 Street NW and east of 1 Avenue NW and associated earthworks.

.3 Raising a length of approximately 1025 metres of earthen flood protection dike on the north bank of the Red Deer River in the neighborhood of Midland and associated earthworks.

.4 Storm system improvements in Midland as identified in the drawings.

.5 Installation of riprap bank stabilization and aprons at storm system improvements locations as identified in the drawings.

.6 Installation of riprap bank stabilization and aproning at locations in Midland as identified in the drawings.

.7 Landscaping including topsoil replacement and seeding.

.8 Other works as identified in the drawings.

.2 The Site of the Work of this Contract is located along the north bank of the Red Deer River in Sections 9 and 10, Township 29, Range 20, West of 4th Meridian, within the Midland neighborhood in the Town of Drumheller, Alberta.

2.3 CONTRACT TIME

.1 The Contract will commence on the date on which the contract has been signed by both parties.

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

.3 Refer to the contract documents of the Assignable Contract for contract time provisions specified for the Assignable Contract.

.4 Attain Substantial Performance of the Work by November 15, 2022, except for the following:

.1 Subsoil and Topsoil Placement

.2 Seeding/Hydroseeding

.3 Final Commissioning

.5 Attain Total Performance of the Work by May 15, 2023, or as agreed upon by the Owner in the event of material supply delays.

2.4 WORK RESTRICTION/MILESTONE DATES

.1 Ensure conformance to all applicable Town of Drumheller Community Standards Bylaws.

.2 As a Class C water body, construction operations in the Red Deer River are prohibited between the dates of April 16 and June 30 of any year.

2.5 BORROW AREAS AND RIPRAP SOURCES

.1 The Contractor shall source their own borrow areas for supply of Impervious Fill Zone 1A materials as described in Section 02330 – Earthwork Materials.

.2 The location(s), excavation layout(s), excavation methods, scheduling, and sequencing of Borrow Area Excavation to provide suitable Impervious Fill materials is the sole responsibility of the Contractor.

.3 The Contractor is responsible to obtain all applicable permits (may include Alberta Transportation, Historical and Paleontological Resources, etc), agreements, access rights, and approvals necessary to source borrow material. The Contractor is to comply with any specific conditions required by the applicable landowner(s).

.4 Where there are conflicts with existing utilities at the borrow source(s) the Contractor is responsible for obtaining required agreements with each utility company and protection of the utility throughout any borrow development.

.5 The chosen borrow material(s) must be pre-approved by the Contactor and Owner/Engineer of Record as outlined in Section 02330 – Earthwork Materials. Only the pre-approved borrow materials may be used for the project. If at any point in the project the Contractor requires material from a different borrow source, the new borrow area material must be pre-approved for use by the Contactor and Owner/Engineer of Record.

2.6 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 Use of the areas within the Site described above are subject to the following conditions:

.1 Use designated Stockpile / Laydown areas to store, stockpile, maintain, repair, assemble, clean, or produce only the materials, equipment and supplies required for the Work of this Contract.

.2 Locate the Owner's Site Office within the Stockpile/Laydown areas.

.3 Use only the designated Site Access Routes to transport, deliver or haul to or from the Site, materials, personnel, equipment, and supplies required for the Work of this Contract, in accordance with Section 01552- Existing and Temporary Roads. Ensure that all Contractor suppliers, agents, and related personnel, use only the designated Site Access Routes.

.4 Accommodate public traffic and provide public safety measures, including those required along North River Drive, according to Section 01552 – Existing and Temporary Roads and Section 01411 – Work Site Safety. Provide safety measures to exclude public access to the Site or associated hazards.

.5 Accommodate construction activities adjacent to the Site by other Contractors or the Owner. Accommodate construction traffic along portions of the Site comprising public roads.

.6 Close, sign and restrict public access to the regional pathway, within the Site, to the satisfaction of the Owner according to Section 01411 – Work Site Safety.

.7 Accommodate and coordinate for all municipal maintenance, garbage collection, road, sidewalk, utility servicing or other municipal activities, inspections or repairs by the Town of Drumheller or utility authorities.

.4 Assume responsibility for the care and protection of the existing work within the Site.

.5 Confine plant, equipment, products and operation of workmen to the Site Limits.

.6 Jointly use the area within the Site Limits with the Owner, the Owner's agents, and local utility authorities.

.7 Assume responsibility for the care and protection of the existing work within the Site, including utilities and municipal infrastructure.

2.7 PUBLIC ROADS

.1 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.

.2 Conform to bylaws, regulations imposed by local road and street authorities including Starland County, Kneehill County, Wheatland County, and the Town of Drumheller.

.3 Do not permit travel of tracked vehicles along asphalt concrete paved public roadways unless measures suitable to the Owner to preclude damage are in place. Undertake all repairs and associated costs for roadway damage.

.4 For information and requirements of local haul routes the Contractor shall contact the following: Information on local Town of Drumheller road bans can be obtained by calling Roadata Services at 1-888-830-7623

3.0 PRODUCTS NOT USED

4.0 EXECUTION NOT USED

END OF SECTION

1.0 GENERAL

1.1 PERFORMANCE OF WORK COVERED BY ALLOWANCES

.1 The Owner will determine who will perform the Work covered by the allowances.

.2 If not specified, the Owner will determine the manner in which prices are obtained for Work covered by the allowances.

.3 When requested or specified, assist the Owner by identifying potential Suppliers and Subcontractors and obtaining prices for Work covered by the allowances.

.4 Work and expenditures from the allowances will only be made when authorized in writing by the Owner.

1.2 CONTRACTOR'S RESPONSIBILITIES

.1 The Contractor's responsibilities for Work covered by the allowances shall be the same as for other Work of this Contract.

.2 On notification in writing of the selection of a Supplier or Subcontractor by the Owner, execute a contract for the Products or Work with the designated Supplier or Subcontractor.

1.3 SCHEDULING WORK COVERED BY ALLOWANCES

.1 For Work covered by the allowances, including the allowance[s] for unforeseen work:

.2 perform the Work within the Contract Time; and include the Work in the construction schedule.

.3 The Owner will supply the Contractor with required documentation or information within the time specified or, where such time is not specified, in sufficient time to permit the construction schedule to be maintained.

1.4 ALLOWANCES: UNFORESEEN WORK

.1 The amount of the allowance includes all costs. Do not include in the Contract Price any separate costs in excess of the allowance amount.

.2 Work performed under the allowance will be authorized by Change Order and valued in accordance with General Provisions Section 4.6.8 – Changes and Variations.

.3 Allow the amount specified in the Schedule of Prices for unforeseen work.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 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.

Abbreviation/Symbol	Meaning
µm	micrometre or micron
mm	millimetre
m	metre
mm^2 or mm2	square millimetre
m^2 or m2	square metre
ha	hectare
kPa	kilopascal
MPa	megapascal
m^3 or m3	cubic metre
l (or where clarity is needed 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

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:

Quantity	**Dimension**
Volume of earth	centimetre
Volume of concrete	millimetre
Length of pipe	centimetre
Area of land	decimetre

.4 the survey system adopted will be at 20 linear metres spacing for measuring earthwork;

.5 contours are based on LiDAR provided by the Province of Alberta and ground survey captured by Altalis in 2021 (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 as shown on the Drawings and 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] [horizontal] 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 survey data input to earthwork terrain modelling software (CAD-Civil 3D); where volumes are computed using the triangulation method of comparing pre and post construction digital elevation surface models.

.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 clause 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 clause 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 anytime 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 may be 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 a progress 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 Work will include the amount of work performed for Mobilization and Demobilization, Existing and Temporary Roads, and Care of Water.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 MEASUREMENT SCHEDULE

.1 Schedule: See next page.

.2 Quantity Calculations – Scheduled Lump Sum items.

.1 When an interim payment is to be a specified percentage of a lump sum item, and is calculated based on the ratio of the value of Work completed to the interim date, and the Contract Bid Amount, that specified percentage will be included in the calculation of the value of the Work completed to that interim date.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
1. GENERAL REQUIREMENTS		
1.1	Mobilization and Demobilization	.1 Scope: Mobilization includes supplying and transporting to the Site, labour, equipment, products and incidentals; providing and maintaining temporary facilities and controls, temporary buildings including site office, utilities, safety and security measures including temporary fencing, and other construction necessary for Contractor's methods carried out during performance of the Contract and which does not remain as part of the Permanent Work; preparing, supplying materials for, and implementing the ECO and ESC Plans; monitoring, rectifying any non-compliance; and reporting as required by the ECO and ESC Plans, and; all related work and materials for which payment is not included elsewhere. Demobilization includes removing and transporting from the Site, labour equipment, products, and other items not required to remain upon Total Performance of the work; cleaning up of the Site and laydown; and all related work and materials for which payment is not included elsewhere. Mobilization and Demobilization includes interim and partial mobilization and demobilization activities required to perform the Work of the Contract. .2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item. .1 Payment of 25% of the Lump Sum amount after completion of Work for 5% of the Contract Bid amount. .2 Payment of another 25% of the Lump Sum amount after completion of Work for 25% of the Contract Bid amount. .3 Payment of another 25% of the Lump Sum amount after completion of Work for 50% of the Contract Bid amount. .4 Payment of the remaining 25% of the Lump Sum amount after completion of all Work of the Contract and issuance of the Construction Completion Certificate.
1.2	Existing and Temporary Access Roads	.1 Scope: Includes providing earthwork materials, designing, preparing, installing, constructing, maintaining during construction and removing when required of existing and temporary roads including: access roads, haul road and detour, pathways, trails, construction facilities and laydown areas, parking areas required for and used by Contractor-generated traffic. Includes providing surface protection measured, barriers, signage, flag persons, dust control, and other measures to safely regulate traffic for all detours and existing and temporary roads

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		required for, as a result of, or used by Contract generated traffic, conducting video surveys or other means accepted by the Owner Representative to document pre-construction conditions, removing snow from existing and temporary roads and detours, preparing submittals, obtaining approvals, paying all levies required by the Town, and all related work and materials for which payment is not included elsewhere. Earthwork materials incorporated into these works will not be paid for under any other item. Other materials incorporated into these works will not be paid for under any other item. .2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item. .1 Payment of 25% of the Lump Sum amount after completion of Work for 5% of the Contract Bid amount. .2 Payment of another 25% of the Lump Sum amount after completion of Work for 25% of the Contract Bid amount. .3 Payment of another 25% of the Lump Sum amount after completion of Work for 50% of the Contract Bid amount. .4 Payment of the remaining 25% of the Lump Sum amount after completion of all Work of the Contract and issuance of the Construction Completion Certificate.
2. SITE WORK		
2.1	Demolition and Removal	.1 Scope: Includes demolishing and disposing of existing pathways (paved and gravel), existing concrete headwalls, existing storm sewers as identified on the Drawings; all work associated with the demolition including saw cutting, breaking, demolishing; excavating, removing, temporary stockpiling and rehandling of demolished materials; loading, hauling, and disposing of demolished materials including asphalt concrete pavement, concrete, and debris, at an off-Site disposal facility; and all related work and materials for which payment is not included elsewhere. .2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.
2.2	Demolition and Salvage	.1 Scope: Includes salvaging, removing, temporary stockpiling and rehandling of existing signs, sign posts, benches, barriers, waste bins, and flap gates; loading, hauling, unloading and stockpiling salvaged materials at the on-Site storage area; repair, cleaning or replacement of damaged components, providing new posts,

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		foundations or anchoring mechanisms and loading, hauling, handling, reinstalling, remounting, supporting, backfilling and affixing existing signs, sign posts, benches, flap gates, and associated anchoring mechanisms; and all related work and materials for which payment is not included elsewhere. .2 Payment: Lump Sum paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.
2.3	Clearing and Grubbing	.1 Scope: Includes all labour, equipment and material needed to cut, grub, removing, load, haul, and dispose at an off-Site disposal facility, of logs, trees, brush, stumps, roots, and other deleterious material from designated areas; protect and treat trees and shrubs that are to remain; protect roots designated by the Owner to remain; protect existing facilities designated by the Owner to remain; level, grad and finish of cleared areas; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the area of Clearing and Grubbing as measured by survey. .3 Payment: Unit price per square metre.
2.4	Topsoil and Subsoil Stripping	.1 Scope: Includes labour, equipment and resources to strip, sort, load, haul, dump, and stockpile Topsoil in specified areas, and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be cubic meters of stripped soil volume between the original ground surface and the stripped ground surface as measured by survey. .3 Payment: Unit Price per cubic metre.
2.5	Excavation	.1 Scope: Includes excavating; shaping and trimming to finished excavation surfaces; temporary stockpiling and rehandling, if required; sorting, loading, hauling, dumping, initial spreading of suitable materials in fill placement areas; temporary stockpiling, rehandling, loading, hauling, and disposing of unsuitable soil materials at an off-Site waste disposal area; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the excavated volume between the stripped ground or base of gravel subgrade surface as measured by survey and the excavation lines, grades, and elevations specified in the Contract Documents or as adjusted by the Owner. .3 Payment: Unit Price per cubic metre.
2.6	Impervious Fill Zone 1A	.1 Scope: Includes all labour, equipment, and resources required to investigate, test, verify suitable quality, provide submittals and quality control, paying royalties, supply, load, haul, temporary

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		stockpile, rehandle, place, and compact Impervious Fill Zone 1A to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; and all related work and materials for which payment is not included elsewhere. It is the responsibility of the Contractor to determine a suitable fill source location. Material that does not meet requirements of Impervious Fill Zone 1A delivered to site will not be compensated for. Overages in fill delivered to site will not be compensated for. .2 Measurement: Shall be cubic meters of suitable Impervious Fill Zone 1A fill, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents. .3 Payment: Unit Price per cubic meter.
2.7	Topsoil Placement	.1 Scope: Includes obtaining Topsoil from temporary onsite stockpiles; preparing receiving surfaces; dumping, spreading, grading, scarifying, cultivating, and preparing Topsoil obtained from Stockpile; removing and disposing of rocks and deleterious materials; and all related work for which payment is not included elsewhere. .2 Measurement: Shall be the in-place volume of Topsoil as determined from the top surface area of the Topsoil measured by survey multiplied by the thickness specified in the Contract Documents or as adjusted by the Engineer of Record.
2.8	Imported Topsoil	.1 Scope: Includes paying royalties, supplying, transporting to site and temporarily stockpiling imported Topsoil; preparing receiving surfaces; rehandling from temporary stockpile, hauling, dumping, spreading, grading, scarifying, cultivating Imported Topsoil; removing and disposing of rocks and deleterious materials; and all related work for which payment is not included elsewhere. .2 Measurement: Shall be the in-place volume of Imported Topsoil as determined from the top surface area of the Imported Topsoil measured by survey multiplied by the thickness specified in the Contract Documents or as adjusted by the Engineer of Record.
2.9	Bedding 5B	.1 Scope: Includes preparing receiving surfaces; supplying, paying royalties, sizing, screening, quality control testing, loading, hauling, temporary stockpiling, placing, and trimming of Bedding 5B; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the in-place volume of Bedding Gravel 5B between the fill lines, grades, slopes, elevations and dimensions specified in the Contract Documents or as adjusted by the Engineer of Record.

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
2.10	Riprap Class 1	.1 Scope: Includes all labour, equipment, and resources required supply and place Riprap Class 1 to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; supply and place geotextile; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be cubic meters of Class 1 Riprap, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents. .3 Payment: Unit Price per cubic meter.
2.11	Riprap Class 2	.1 Scope: Includes all labour, equipment, and resources required supply and place Riprap Class 2 to the design lines, grades, and elevations as shown on Drawings and in the Contract Documents; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be cubic meters of Class 2 Riprap, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents. .3 Payment: Unit Price per cubic meter.
2.12	Ø 300 mm PVC Pipe	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 300 mm PVC pipe, as shown in the Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative. .3 Payment: Unit Price per meter.
2.13	Ø 450 mm Concrete Pipe	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 450 mm concrete pipe, as shown in the Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative. .3 Payment: Unit Price per meter.
2.14	Ø 600 mm Concrete Pipe	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm concrete pipe, as shown in the

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		Design Drawings and specifications, including: supplying, transporting, and storing pipe; preparing receiving surfaces, installing pipe sections, and backfill; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be meter of pipe placed, as determined by survey and the finished grade lines, grades, slopes, and elevations specified in the Contract Documents or as adjusted by The Owner Representative. .3 Payment: Unit Price per meter.
2.15	1S Manhole 1.2x1.2	.1 Scope: Includes all labour, equipment, and materials required to supply and install 1S (1.2m x 1.2m) concrete manhole as shown in the Design Drawings, including excavation, base preparation, manhole installation of barrel, backfill, risers, lid/grate./hatch, and all other and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per manhole installed as inspected by Engineer of Record. .3 Payment: Unit Price per manhole.
2.16	1S Manhole 1.5x1.5	.1 Scope: Includes all labour, equipment, and materials required to supply and install 1S (1.5m x 1.5m) concrete manhole as shown on the Design Drawings, including excavation, base preparation, manhole installation of barrel, backfill, risers, lid/grate/hatch, and all other and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per manhole installed as inspected by Engineer of Record. .3 Payment: Unit Price per manhole.
2.17	5A Manhole	.1 Scope: Includes all labour, equipment, and materials required to supply and install 5A concrete manhole rise extension on existing manhole(s) as shown in the Design Drawings, and all related work and materials for which payment is not included elsewhere incl. excavation. .2 Measurement: Shall be per manhole installed as inspected by Engineer of Record. .3 Payment: Unit Price per manhole.
2.18	Ø 450 mm Concrete Headwall	.1 Scope: Includes all labour, equipment, and materials required to supply and install precast concrete headwall for Ø 450 mm pipe as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. This includes supply and install of bedding gravel and all bedding preparatory work. .2 Measurement: Shall be per concrete headwall for Ø 450 mm pipe

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		.3 Payment: Unit Price per concrete headwall for Ø 450 mm pipe
2.19	Ø 600 mm Concrete Headwall	.1 Scope: Includes all labour, equipment, and materials required to supply and install precast concrete headwall for Ø 600 mm pipe as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. This includes supply and install of bedding gravel and all bedding preparatory works. .2 Measurement: Shall be per concrete headwall for Ø 600 mm pipe .3 Payment: Unit Price per concrete headwall for Ø 600 mm pipe
2.20	Ø 300 mm Tideflex Valve (TF-1)	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 300 mm Tideflex Check-Valve (TF-1) as shown in the Design Drawings and specifications, and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per Ø 300 mm Tideflex Check-Valve (TF-1) .3 Payment: Unit Price per Ø 300 mm Tideflex Check-Valve (TF-1)
2.21	Ø 600 mm Tideflex Valve (TF-1)	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm Tideflex Check-Valve (TF-1) as shown in the Design Drawings and specifications, and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per Ø 600 mm Tideflex Check-Valve (TF-1) .3 Payment: Unit Price per Ø 600 mm Tideflex Check-Valve (TF-1)
2.22	Ø 450 mm Sluice Gate	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 450 mm sluice gate as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per Ø 450 mm sluice gate. .3 Payment: Unit Price per Ø 450 mm sluice gate.
2.23	Ø 600 mm Sluice Gate	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm sluice gate as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per Ø 600 mm sluice gate. .3 Payment: Unit Price per Ø 600 mm sluice gate.
2.24	Ø 600 mm Grated Inlet	.1 Scope: Includes all labour, equipment, and materials required to supply and install Ø 600 mm grated inlet/outlet as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere.

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		.2 Measurement: Shall be per grated inlet/outlet for Ø600 mm pipe. .3 Payment: Unit Price per Ø 600 mm grated inlet/outlet.
2.25	Willow Plantings	.1 Scope: Includes all labour, equipment, and materials required to supply and install willow planting as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. .2 Payment: Unit Price per lineal metre.
2.26	Hydroseed	.1 Scope: Includes all labour, equipment, and materials required to supply and install hydroseed as shown in the Design Drawings and specifications and all related work and materials for which payment is not included elsewhere. .2 Payment: Unit Price per square metre of hydroseeding.
2.27	Vehicle Access Control Gates	.1 Scope: Includes all labour, equipment, and materials required to supply vehicle access control gates, fill concrete, and all associated accessories, drilling post holes and backfilling with fill concrete, fabricating, painting, supplying, storing, handling, and installing vehicle access control gates, and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be per vehicle access control gate. .3 Payment: Unit Price per each vehicle access control gate installed.
3. MAINTENANCE		
3.1	Landscape Maintenance Year 1	.1 Scope: Includes watering, controlling weed growth, protecting and ensuring acceptable establishment of seeded area and plants; reseeding and replanting areas that fail to thrive; replacing defective plants; mowing grass, picking up and removing litter; preparing monthly maintenance reports and implementing corrective and preventative measures to achieve acceptable establishment; and all related work and materials for which payment is not included elsewhere. Starting date for Year 1 begins at the date of issuance of the Construction Completion Certificate. No measurement will be made until the required maintenance reports have been submitted. .2 Measurement: Shall be for monthly maintenance work completed as determined from inspections by the Engineer of Record. .3 Payment: Shall be per year.
3.2	Landscape Maintenance Year 2	.1 Scope: Includes watering, controlling weed growth, protecting and ensuring acceptable establishment of seeded area and plants; reseeding and replanting areas that fail to thrive; replacing defective plants; mowing grass, picking up and removing litter;

ITEM NO.	ITEM NAME	SCOPE, MEASUREMENT AND PAYMENT
		preparing monthly maintenance reports and implementing corrective and preventative measures to achieve acceptable establishment; and all related work and materials for which payment is not included elsewhere. Starting date for Year 1 begins at the date of issuance of the Construction Completion Certificate. No measurement will be made until the required maintenance reports have been submitted. .2 Measurement: Shall be for monthly maintenance work completed as determined from inspections by the Engineer of Record. .3 Payment: Shall be per year.
4. CASH ALLOWANCES		
4.1	Care of Water and Turbidity Barriers	.1 Scope: Includes designing, supplying, installing, constructing, operating, maintaining, monitoring and removing care of water provisions, isolation measures such as turbidity barriers, fish capture and release, and turbidity monitoring, required to perform the work, and all related work and materials for which payment is not included elsewhere according to contractor's ECO Plan and regulatory conditions. .2 Payment: Cash Allowance.
4.2	Repairs to Existing Storm Sewers	.1 Scope: Includes inspection by CCTV and preparing and submitting inspection records; implementing possible repairs to existing storm sewer, including excavation, supply and installation of pipe and repair couplers; supply, placement, and compaction of bedding and backfill materials; surface restoration, and; and other work identified by the Engineer of Record. .2 Payment: Cash Allowance.

END OF SECTION

1.0 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

.2 The Contractor shall be responsible for administrative requirements for the following Contract meetings:

.1 Workplace Orientation

.2 Safety

.3 Weekly Site Meetings

.3 The Owner or the Contractor may request additional meetings related to installation of equipment, co-ordination with other Contractors, commissioning progress, warranty, dispute resolution, municipal compliance, environmental issues, public safety, traffic, permitting, or utility 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 4 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 Change proposals, change orders, approvals required, costing and mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.8 Products and materials provided by the Minister.

.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 or as otherwise determined by the Engineer of Record.

.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 Minister, 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 Change proposal effects 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 per Contractor's COR Safety Program.

.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 Covid-19 Protocols

.2 Project description including areas of work and other concurrent construction contracts.

.3 Hazardous areas including open excavations, construction equipment traffic, blasting, and chemical or explosive storage, etc.

.4 Safety equipment to be worn by workers, including areas with special requirements.

.5 Traffic routes on the Site.

.6 Evacuation procedures.

.7 First aid procedures.

.8 Excavation or work permit procedures.

.9 WHMIS (Workplace Hazardous Materials Information System) requirements for handling and storage of chemicals.

.10 Fire safety rules and regulations.

.11 Rules and regulations regarding wildlife, environmental concerns, drugs, alcohol, etc.

1.6 SAFETY MEETINGS

.1 Frequency: Per Contractor's COR Safety Program, no less than weekly during the course of the Work for each area of work. Safety Meetings may form part of the Weekly meeting agenda.

.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.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 FORMAT OF SCHEDULE

.1 Base the format of the construction schedule on the following:

.1 Horizontal bar chart of sufficient size to clearly indicate all required information.

.2 Time divided into months, weeks, and days. Identify the first workday of each week.

.3 Space for revisions.

1.2 QUALITY OF SCHEDULE

.1 Provide a separate bar for each activity.

.2 Indicate the start and completion dates for each activity, and the work restriction and Milestone Dates, and the Contract Time specified in Section 01110 – Summary of Work.

.3 Indicate the projected percentage of completion for each activity as of the first day of each month.

1.3 SUBMITTALS

.1 Provide the following submittals.

.2 Construction schedule:

.1 Within 10 days of receipt, the Owner will either return the submitted construction schedule to the Contractor with no exceptions taken or require revisions to the construction schedule. Provide a revised construction schedule within 5 days of receiving the Owner's comments, if any.

.2 An initial construction schedule for the Owner's review within 15 days after the date of commencement of the Contract.

.3 Not Used.

.4 Progress revisions within 15 days after receiving notice to do so from the Owner.

1.4 USE OF THE CONSTRUCTION SCHEDULE

.1 Adhere to, and require that all Subcontractors and Suppliers adhere to, the construction schedule.

1.5 PROGRESS REVISIONS

.1 Revise the construction schedule upon request by the Owner if, in the Owner's opinion:

.2 the progress of the Work is substantially different from the latest construction schedule and the date of Substantial Performance of the Work appears to be in jeopardy.

.3 the Work is being performed in a sequence that is not in keeping with the general work sequence of the latest construction schedule; or

.4 a revision is necessary to reflect a required adjustment to the Contract Time that has been authorized by the Owner.

.5 Outline methods to be used to complete the Work within the Contract Time.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 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 Additional submittals required but not specified in other sections of the contract are appended to this section. Submit these submittals prior to commencement of Work at the Site.

1.3 SUBMITTAL PREPARATION

.1 Determine and verify the following:

.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 Minister, 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 the following:

.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 the following:

.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 daysof 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, and does not require re-submittal, 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 REPRODUCTION OF SUBMITTALS

.1 After review of the submittal, the Owner will reproduce the number of copies of the submittal that the Owner requires, and return the reviewed reproducible documents.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 RELATED SPECIFICATIONS

.1 Section 01391 Environmental Protection.

.2 Alberta Transportation Erosion and Sediment Control Manual June, 2011

1.2 ENVIRONMENTAL LEGISLATION

.1 The Owner will obtain the environmental approvals, permits, licences, and authorizations required for the Project.

.2 The Contractor shall familiarize itself with all applicable federal and provincial legislation and regulations concerning environmental protection and shall conduct its activities in accordance with such legislation and regulations, including, but not necessarily limited to, the provincial Historical Resources Act, Environmental Protection and Enhancement Act and Water Act and the federal Fisheries Act and Navigable Waters Protection Act.

.3 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.

.4 Provide The Owner with written confirmation of Contractor's full compliance with all approvals, permits, licences and authorizations before the full amount of holdback will be released.

.5 The Contractor shall also familiarize itself with all applicable Codes of Practice issued by Alberta Environment and shall conduct its activities in accordance with such Codes of Practice, including, but not necessarily limited to, the Code of Practice for Asphalt Paving Plants and the Code of Practice for Pits, both under the Environmental Protection and Enhancement Act and the Code of Practice for Watercourse Crossings under the Water Act.

.6 In the event of conflicting statements between the various Acts, Authorizations, Permits, and Codes of Practice, the more stringent requirement shall apply.

.7 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.

1.3 ECO PLAN

.1 Prepare and implement an Environmental Construction Operations Plan for each phase of the Contract in accordance with the Alberta Transportation manual entitled "Environmental Construction Operations Plan (ECO Plan) Framework," July 2020 version. 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 and environmental monitoring that the Contractor undertakes to comply with all applicable legislation, regulations, and approvals during the course of construction and during "winter shut down," and other similar "shut down". The ECO Plan shall incorporate a Siltation and Erosion Control Plan (SECP) and provisions for sections below.

.1 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 identifiedat the pre-construction meeting.

.2 The ECO Plan shall not cover any permanent or long term environmental, or erosion control devices or work specified in the Contract.

.3 Submit the ECO Plan to The Owner at least 7 calendar days prior to the pre-construction meeting. The Owner will review the ECO Plan and communicate any concerns to the Contractor at least 7 calendar days prior to the pre-construction meeting. Address any issuesor concerns regarding the proposed ECO Plan to the satisfaction of The Owner prior to the commencement of the Work.

.4 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. When the Contractor's work zone representative changes, the new work zone representative shall provide a letter of acknowledgment to the Owner indicating that the new work zone representative has reviewed the ECO Plan and will comply with its requirements.

.5 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 that the "temporary environmental control measures" detailed in the ECO Plan are sufficient to ensure compliancewith all applicable 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.

.6 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 andthe Contractor shall modify the ECO Plan accordingly.

.7 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, the Owner may make other arrangements to have the Work done and deduct the cost thereof from any money owing to the Contractor.

.8 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 including removing and disposing of material from silt containment ponds and sediment barriers will be incidental to the Work and will not be paid for separately.

1.4 GENERAL ENVIRONMENTAL PROTECTION REQUIREMENTS

.1 Advise The Owner as soon as possible of any accidents.

.2 Conduct accident investigations.

1.5 DISPOSAL OF WASTE MATERIALS

.1 Do not release, dump, spill or dispose of any substance into the environment that causes or could cause impairment of or damage to the environment or human health or safety. Mitigate to ensure compliance with all regulatory legislation, any wastes arising from the work and any other substances that causes or could cause impairment of or damage to the environment or human health or safety, and should Contractor fail to do so, the Owner may, without further notice, arrange the clean-up of such wastes and other substance at the expense of the Contractor.

.2 Remove and dispose of any inert solid waste materials resulting from the work in accordance with Alberta Environment's Construction, Renovation and Demolition Waste Reduction Guidelines and as determined by the Owner prior to Total Performance of the Work or othertime scheduled in the Contract Documents. The Contractor may temporarily store such material in interim stockpiles on the disturbed land.

.3 Where applicable, dispose of waste materials at the Drumheller Landfill.

1.6 REPORTING PROCEDURES FOR SPILLS OF DELETERIOUS OR HAZARDOUS MATERIALS

.1 During the construction, any release of silt or other deleterious substance into a body of water or watercourse, the Contractor shall immediately report to the Owner, Alberta Environment and the Federal Department of Fisheries and Oceans (1-800-222-6514).

.2 In the event of the release of silt or other deleterious substance into a body of water or watercourse, the Contractor shall take all reasonable measures to contain the release and repair any damage at its expense. Spills or releases of hazardous materials and any other substances that cause or could causeimpairment of or damage to the environment or human health or safety shall also beimmediately reported to The Owner, Alberta Environment and, if a body of water or watercourse is involved, The Owner, Alberta Environment and the Federal Department of Fisheries and Oceans (1-800-222-6514). Take all reasonable measures to contain the spill and cleanup and any such work shall be performed in accordance with the applicable legislation and regulations at the Contractors' expense.

1.7 WEED CONTROL & CLUBROOT MANAGEMENT PLAN & WHIRLING DISEASE

.1 Whirling Disease

Whirling disease is caused by Myxobolus cerebralis, a microscopic parasite of salmonid fish,including trout and whitefish. This disease can cause high levels of mortality in some fish.

To prevent the spread of Whirling Disease in Alberta, all equipment that may come in contactwith the stream environment (water, sediment, aquatic flora and fauna) must arrive and departthe worksite clean, dry and disinfected. Care should be taken to ensure water from cleaning does not re-enter any nearby waterways through runoff, ditches, or storm drains. The

Contractor must comply with all decontamination conditions contained in regulatory approvals and as per the latest Alberta Government guidelines: (https://www.alberta.ca/stop-whirling-disease.aspx). As part of the ECO Plan the Contractorshall detail their proposed Whirling Disease control measures for all instream work and workwithin the riparian area.

.2 Clubroot Management Plan

Clubroot, caused by Plasmodiophora brassicae, is a serious disease of cruciferous crops (i.e. mustards, canola, etc.) which can result in reduced to severe yield losses. Clubroot wasdeclared a pest under Alberta's Agricultural Pests Act in April 2007. Enforcement of the Actis the responsibility of the Agricultural Service Board located in each municipality.

The Contractor shall carry out their operations in accordance with the provisions in the attached Weed Control and Clubroot Management Plan and the Best Management Practices outlined in the Alberta Clubroot Management Plan which is available on-line at the following location:

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex11519

As part of the ECO Plan, the Contractor shall detail their proposed Clubroot control measures for soil disturbance work at locations involving Clubroot infected soils. Details shall include proposed equipment cleaning procedures as well as any control measures recommended by the Municipality's Agricultural Fieldman.

Soil disturbance work shall not commence until the Contractor's ECO Plan has been reviewed and accepted by the Consultant.

All costs associated with the implementation of Clubroot control measures, including those required by the applicable Agricultural Service Board, will be considered incidental to the Work and no separate or additional payment will be made.

.3 Black Knot Fungus

To control the spread of black knot fungus, caused by Dibotryon morbosum or Apiosporinamorbosa, contractors must develop and implement a site-and species-specific weed management plan, as per Alberta Weed Control Act and Weed Control Regulations. A localized weed survey is to be conducted between June and August at construction sites and along equipment movement corridors to identify any weed species present. All equipment entering the project site must be cleaned before arrival to prevent the spread ofweed species. Removing and destroying wood infected with black knot fungus is the only way to control the disease once it is present. If black knot fungus is identified, the diseasedwood must be immediately removed and disposed of at the Town landfill facility.

As part of the ECO Plan the Contractor shall detail their proposed Black Knot Fungus controlmeasures for removal and hauling of any black knot found on Site.

All costs associated with the implementation of Black Knot Fungus control measures will beconsidered incidental to the Work and no separate or additional payment will be made.

.4 Dutch Elm Disease

To control the spread of Dutch Elm Disease, caused by Ophiostoma ulmi or Ophiostoma nova-ulmi, European Elm Bark Beetle (Scolytus multistriatus) and Native Elm Bark Beetle (Hylurgopinus rufipes), contractors must develop and implement a site-and species-specificweed management plan, as per Alberta Weed Control Act and Weed Control Regulations.

The Contractor shall carry out their operations in accordance with the provisions in the attached Alberta Government Dutch Elm Disease Prevention and Control Plan and the Best Management Practices outlined in the Alberta Dutch Elm Disease Prevention and Control Plan Management Plan which is available on-line at the following location:

http://www.alberta.ca/dutch-elm-disease.aspx

http://www.alberta.ca/dutch-elm-disease-prevention-what-you-can-do.aspx

Removing and destroying wood infected with Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle is the only way to control the disease once it is present. If Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle is identified, the diseasedwood must be immediately removed and disposed of at the Town landfill faciilty to prevent spread.

As part of the ECO Plan, the Contractor shall detail their proposed Dutch Elm Disease/ European Elm Bark Beetle / Native Elm Bark Beetle control and removal measures. Details shall include any control measures recommended by the Municipality's Agricultural Fieldman.

All costs associated with the implementation of Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle control measures will be considered incidental to the Work and no separate or additional payment will be made.

1.8 CONTROL OF SURFACE WATER RUN-OFF

.1 All exposed areas resulting from construction activities will require erosion control devices. Extra erosion and sediment control materials shall be on site during the construction period should a precipitation or snowmelt event occur at a vulnerable time.

.2 If runoff or sediment laden water from the area disturbed by the construction exists, it should be diverted to a settling pond, sediment trap, or through a vegetated area to minimize erosion and sedimentation of the waterbody and/or storm drain inlets. All flow diversion will be conducted such that it does not adversely affect the land and in a manner such that it will not disturb sediments in the waterbody.

.3 Stabilize all disturbed areas, including exposed soils and slopes, by:

.1 Immediately installing temporary erosion control measures to remain in place until vegetation or other long-term erosion control methods are fully established and functioning.

.2 Installing and placing long-term erosion control measures including, but not limited to, slope stabilization and re-vegetation.

.4 Accumulated sediment shall be removed from sediment control devices as required to ensure effective treatment of surface runoff. The Contractor shall remove sediment in such a manner that no sediment is released downstream of the structure and also to ensure the device is not damaged. All costs associated with this work will be considered incidental and shall be included in the lump sum price bid for Care of Water and no separate or additional payment will be made.

.5 The Contractor shall take care and handle hazardous materials in accordance with current regulations and the following:

.1 Hazardous material(s) stored on the project site shall be labelled according to the WHMIS regulations and will be suitably contained.

.2 All equipment working in and around the river shall use bio-degradable hydraulic fluid.

.3 All equipment servicing activities with the potential for accidental spills (i.e. oil changes and hydraulic repair) shall be conducted in a designated area.

.4 Used oil, filter and grease cartridges, lubrication containers, and other products of equipment maintenance shall be contained and disposed of at the nearest industrial waste facility.

.5 The Contractor shall fuel, service, wash and stage equipment a minimum of 100 metres from any watercourse. The Contractor shall store fuel within a containment berm that is at least 100 metres from any waterbody and that has a minimum capacity of 110% of the volume of fuel being stored. The Contractor shall control all runoff from washing, servicing and containment areas such that it does not enter any waterbodies.

.6 Ensure waste storage areas do not block drainage ways or that the wastes are at risk of being introduced into a watercourse. The Contractor shall dispose of all waste generated during construction at local landfill sites in accordance with local guidelines. The Contractor shall provide weather-proof and wildlife-resistant garbage containers for waste disposal.

.7 Hydraulic, fuel and lubrication systems of equipment shall be inspected to ensure that systems are in good condition and free of leaks.

.8 To ensure adequate response capability in the event of a fuel spill, fuel and service vehicles shall carry an approved hydrocarbon spill kit for ground spills, in addition to floating sorbent pads and booms for spill cleanup on open water.

.9 All fuel nozzles shall be equipped with functional automatic shutoffs and a minimum 10 kg of commercial grade adsorbent. Shovels and an empty fuel barrel will be carried on all fuel and service vehicles.

.10 All spills shall be reported in accordance with all federal and provincial reporting procedures.

.11 Contaminated soil and vegetation and used sorbent material shall be collected and disposed of at an approved industrial waste disposal facility.

.6 The development, implementation, supply and maintenance of the ECO Plan shall be considered incidental to the Work and no separate or additional payment will be made.

1.9 ASSUMED INSTREAM REGULATORY CONDITIONS

.1 For the purposes of bidding, assume the following regulatory conditions for instream work must be met. Once permit approvals have been obtained, the permit conditions will replace these assumptions. In the event that the following assumptions are substantially different than permit conditions, a Change will be issued.

.1 All mitigation measures outlined in Contract Documents including report “Fall Riverine Habitat Inventory of the Red Deer & Rosebud Rivers in 08/09/10/11-29-20 W4M and 20/29-28-19 W4M”

.2 Isolation plan as outlined in Contract Documents including report “Fall Riverine Habitat Inventory of the Red Deer & Rosebud Rivers in 08/09/10/11-29-20 W4M and 20/29-28-19 W4M”

.3 Turbidity Monitoring Plan as outlined in Contract Documents including report “Fall Riverine Habitat Inventory of the Red Deer & Rosebud Rivers in 08/09/10/11-29-20 W4M and 20/29-28-19 W4M”

END OF SECTION

1.0 GENERAL

1.1 SURFICIAL AQUATIC RESOURCES

.1 Physical:

.1 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.

.2 Conform to the Environmental Construction Operations (ECO) Plan as specified in Section 01390 – ECO Plan.

.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 Do not deepen by excavation or place fill material on the river or stream bed or other surface bodies of water unless such work is part of the Permanent Work or Temporary Work.

.6 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.

.7 Use Construction Equipment with bio-friendly hydraulic fluids, free from external oil and grease when operating in, or within the wetted perimeter, of a river, stream, and other surface bodies of water.

.8 Use clean granular fill with less than 10% 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.

.9 Remove Temporary Work, including culverts and bridges, and reclaim river and stream banks and beds, and other disturbed areas, prior to attaining Substantial Performance of the Work unless specified otherwise.

.10 Silt Fence Management:

.1 Be responsible for, and maintain the fabric in silt fences until the date of Warranty Performance of the Work.

.2 Inspect the fabric, posts, and pins, in the silt fencing at intervals appropriate to weather events. Based on inspections, maintain the fencing to perform for the purpose intended.

.3 Remove silt accumulations and dispose of silt on Site, at locations acceptable to the Minister.

.4 Unless otherwise specified in the Contract Documents, or otherwise requested by the Owner, remove temporary silt fencing within 30 days after the date of Warranty Performance of the Work.

.2 Biological:

.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 Construction operations in the Red Deer River are prohibited between the dates of April 16 and June 30 of any year as a Class C water body.

.3 A qualified Environmental Monitor, subcontracted to the Contractor, must review and inspect the Work and environmental control measures for work completed in close proximity to any bodies of water.

1.2 GROUND WATER RESOURCES

.1 Physical:

.1 Do not change ground water levels in wells located on adjacent lands.

.2 Biological:

.1 Do not change ground water quality in adjacent landowner wells.

1.3 TERRESTRIAL RESOURCES

.1 Wildlife:

.1 Maintain setback distances between construction operations and the habitat of each of the designated wildlife species as designated by the Owner. The Owner may identify additional habitat sites and wildlife species during the Contract Time. Additional work required to protect additional habitat sites and wildlife species will be authorized by Change Order. The Contractor is to notify the Owner seven (7) days in advent of the start of construction. Wildlife habitat and bird nesting surveys will be completed by the Consultant's Qualified Professional.

.2 Do not allow pets on the Site.

.3 Do not allow firearms, hunting, or shooting on the Site.

.4 Do not harass wildlife.

.5 Prevent livestock from entering the Site by installing temporary fences as necessary.

.2 Vegetation and Weed Control:

.1 Remove or control existing and new adverse vegetation that affects adjacent landowners and their croplands, 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 to prevent importing weed seeds.

.3 Notify the Owner prior to commencing adverse vegetation control measures.

.4 Be responsible for damage to crops, 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 by mechanical equipment before they go to seed at no extra cost to the Owner.

.8 Protect existing trees along the work area from damage by the Contractor's activities.

.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 ECO 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 Remove spilled hazardous materials, including hazardous liquid wastes, in accordance with Regulatory Requirements, and reclaim land and other property. Report spills to Alberta Environment and the Owner.

.4 Dispose of hazardous waste materials, including hazardous liquid wastes, in accordance with Regulatory Requirements.

.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^2 of 6 mil polyethylene.

.3 A shovel.

.4 An empty fuel barrel with the lid removed.

.3 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 to contain spilled fuel.

.4 Clearly mark and barricade fuel storage areas and non-portable transfer lines. Use markers that are visible under all weather conditions.

.5 Store waste Construction Equipment lubricants in a tank or closed container and dispose of off-Site in accordance with the Regulatory Requirements.

1.4 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 construction. Flag an area of 15 m beyond the edge, and surrounding, a newly found heritage resource, and report the finding immediately to the Owner.

.3 Additional work required to protect newly found heritage resources will be authorized by Change Order.

.4 Complete all work in compliance with Historical Resources Act Approval #4956-20-0069-002

1.5 SOCIO-ECONOMIC

.1 Air Pollution:

.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 until corrective repairs or adjustments are made.

.3 Control dust on the Site, and prevent dust from the Site from damaging vegetation and dwellings, or causing a nuisance to persons. Be responsible for damages from dust caused by construction operations.

.1 Dust abatement shall be achieved by watering, application of dust abatement materials chosen from the Alberta Transportation Recognized Product List; or through the use of biodegradable soil stabilizers approved by the Owner.

.2 Dust suppressant materials shall be applied, as required, by method subject to the approval of the Owner. The completed treatment shall provide a smooth and relatively dust free surface.

.3 The Contractor shall perform the Work in accordance with the materials supplier's recommended application rates, and methods of roadway preparation and placing of material unless otherwise directed by the Owner.

.4 All costs associated with dust abatement, regardless of number of applications, or required maintenance will be considered incidental to the Work, and no separate or additional payment will be made.

.2 Noise:

.1 Comply with hours of work and noise bylaws required by the Town of Drumheller By-laws, or other local authorities having jurisdiction.

.2 Provide noise barriers to maintain acceptable noise levels outside the barriers, as per Town of Drumheller bylaws or as directed by the Owner.

.3 Perform blasting, drilling, jackhammering, pile driving, and other operations producing high-intensity impact noise between the hours of 9:00 am and 5:00 pm on weekdays except Statutory Holidays. Adhere to other work restrictions specified in the Contract Documents.

.3 Light:

.1 Direct all stationary floodlights to shine downward at an angle less than horizontal. Provide shielding for all floodlights and do not direct at residences.

.4 Vibration:

.1 This section provides the minimum requirements for vibration monitoring control to be completed by the Contractor and Owner's Representative during all phases of the construction activities. Contractor is advised that the ground vibration may restrict the construction practices.

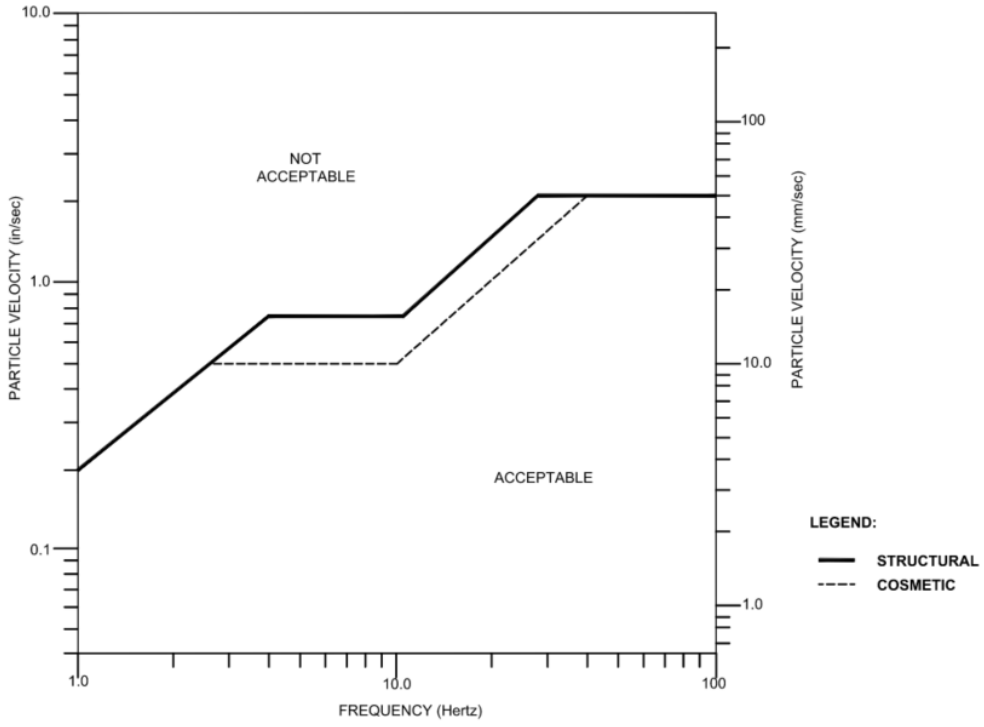
.1 The purpose of the construction vibration monitoring program is to assess possible impacts that construction activities might have on adjacent facilities in order to protect these facilities from vibration induced damage during all phases of the work. The facilities include, but are not limited to, adjacent residential buildings within proximity of the Work.

.2 The Contractor shall be responsible for the following requirements:

.1 The Contractor shall sign off on the Vibration Monitoring Plan prepared by the Town and work with the Owner's Representative to ensure that construction vibrations do not exceed the levels described below. The Owner's Representative shall monitor the vibration levels generated at any stage during construction.

.2 All Areas: Conduct construction activities so that vibration levels at a distance of 30m from construction limits or at nearest affected building (whichever is closer) do not exceed the cosmetic threshold as listed in the Figure below.

FIGURE 1: STRUCTURAL AND COSMETIC THRESHOLDS FOR VIBRATION (USBM & OSMRE)



.3 The Owner's Representative shall be responsible to complete the following:

.1 Prepare and deliver notices to all adjacent residential buildings within 30m of construction activities notifying them of a public pre-construction meeting for property owners within the zone of influence (30m of proposed dike), which shall be arranged by the Consultant. This meeting is an opportunity to inform property owners of the construction and provide notice of the potential for construction vibrations, discuss the methodology and inform residents of the limits to vibration levels. Residents will also be informed that exterior inspections will be taking place on all buildings within 30m of the dike footprint. Residents will also be advised that they can request interior inspections if they desire.

.2 Owner's Representative will complete exterior inspections on all residential buildings within 30m of the dike footprint. Owner's Representative will also complete interior inspections for all residents that request one. A report shall be prepared and delivered to the Town summarizing all inspections.

.3 The Owner's Representative, or retained Vibration Monitoring Firm, shall prepare a Vibration Monitoring Plan that adheres to the Vibration Monitoring Requirements listed in this specification. The Vibration Monitoring Plan shall be submitted to the Town for Review and Approval. The Contractor shall also sign off on the Vibration Monitoring Plan.

.4 The Owner's Representative, or qualified Vibration Monitoring Firm, shall implement the vibration monitoring plan during construction of the dike and shall work with the Town and Contractor to ensure the plan is followed and that vibration impacts are minimized as much as possible.

.5 Prepare and submit weekly vibration monitoring reports to the Town as described in the Vibration Monitoring Plan.

.6 Complete post-construction damage inspections for any building owners that report damages during the construction of the berms. Owner's Representative shall prepare and submit a report summarizing the post-construction damage inspections to the Town.

.2 Vibration Monitoring Requirements

.1 This section provides the details of the Vibration Monitoring Requirements that will be implemented by the Owner's Representative, or third party, and the Contractor during the construction of the dikes.

.1 Ensure construction vibrations remain below the Cosmetic threshold level shown on Figure 1 above.

.2 During the first stage of work a comprehensive vibration monitoring test section shall be developed, which monitors the construction activities which could create noticeable vibrations and identifies those key construction activities which create the largest vibrations and warrant closer monitoring during the project. The results of the test section shall be used to modify the Contractor's procedures, if required, to maintain vibrations below the alert levels at the adjacent buildings / facilities. The frequency of ongoing monitoring for the remainder of the project will depend on the Contractor's ability to maintain vibrations below the alert level. As a minimum, periodic vibration monitoring shall be carried out every two days during the key construction activities, to provide a record of vibration measurements in each stage / area of work.

.3 The results of the vibration monitoring during the first stage of work will be used to determine the frequency of required monitoring for the remainder of the project. The Owner's Representative will provide the Town with a recommendation on the level and frequency of monitoring moving forward.

.4 Vibration monitors shall be capable of measuring PPV levels triaxially in three directions over a frequency range of 1 to 100 Hz. The monitors shall be Instantel Blastmate Series III or Minimate Plus seismographs or equivalent equipment. The Vibrations monitor shall be capable of recording peak triaxial PPV values in at least 5-minute interval histogram plots. The method of coupling the geophones to the ground shall be described in the vibration monitoring plan. The vibration monitors shall be calibrated and a proof of calibration shall be submitted to the consultant prior to mobilization to site.

.5 The Owner's Representative shall be responsible for protection and maintenance of the vibration monitoring instruments. The Contractor shall cooperate with the Owner's Representative to maintain the monitoring instruments.

.6 The Owner's Representative shall be notified of any vibration-related complaint that is received. The Contractor shall investigate the complaint and prepare an assessment and proposed solution for review by the Owner's Representative. The activity that created the complaint shall be halted until an appropriate solution / resolution has been agreed to and implemented.

.7 The post-construction vibration monitoring summary report shall be submitted to the Town three weeks after the completion of the construction activities.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

END OF SECTION

1.0 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.

.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 ALBERTA BUILDING CODE

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

1.4 OWNER OBTAINED APPROVALS

.1 The Owner has obtained or will obtain the approvals listed below.

.1 Environmental Protection and Enhancement Act (EPEA)

.1 Instrument: Conservation and Reclamation Approval

.2 Agency: Alberta Environment.

.3 Activity: Approval of stormwater management system.

.2 Historical Resources Act

.1 Instrument: Approval.

.2 Agency: Alberta Culture and Status of Women.

.3 Activity: To alter historical resources with mitigation.

.3 Municipal Government Act

.1 Instrument: Approval.

.2 Agency: Municipal Authority.

.3 Activity: To close roads and road allowances

.4 Public Lands Act

.1 Instrument: “D” Reservation.

.2 Agency: Alberta Environment.

.3 Activity: To reserve public lands for the development of the Project.

.5 Water Act

.1 Instrument: Approval and amendment.

.2 Agency: Alberta Environment.

.3 Activity: To construct the Project and perform instream activities

.6 Fisheries Act

.1 Instrument: Authorization

.2 Agency: Fisheries and Oceans Canada

.3 Activity: To perform instream activities.

.7 Navigable Waters Act

.1 Instrument: Authorization

.2 Agency: Transport Canada

.3 Activity: To perform instream activities.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION

.1 All instream works must comply with the ‘Canadian Navigable Waters Act’ signage and marking requirements, including:

.1 Signs stating “Construction Ahead”, legible from a distance of 50 m, placed upstream and downstream of the work area.

.2 That the perimeter of the work site is visible from sunset to sunrise and during periods of restricted visibility by the placement of yellow flashing lights, cautionary buoys with retro-reflective material, or cautionary buoys with yellow flashing lights.

END OF SECTION

1.0 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, Temporary Letter of Certification (TLC) or Certificate of Recognition Equivalency Letter (COREL) 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), TLC or COREL prior to commencing Work at the Site.

.3 WCB Clearance Letter prior to commencing Work at the Site.

.4 The Contractor's safety plan, including the Contractor's safety policy, safety procedures, and a safety education program, at least 10 days prior to commencing Work at the Site.

.5 The name of the person responsible for supervision of the Contractor's safety plan at the Site prior to commencing Work at the Site.

.6 The names of workers qualified as first aiders prior to commencing Work at the Site including monthly updates.

.7 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.

.8 Completed incident forms and reports as soon as possible.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 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.

.4 Submit quality control test results within 48 hours to the Owner.

.5 Quality documentation verifying conformance of materials and installation is required prior to acceptance for payment.

1.2 QUALITY ASSURANCE

.1 The Owner will perform quality assurance testing and inspection as the Owner deems appropriate. No such testing by the owner or its representatives shall relieve the Contractor of its responsibility to construct the work in accordance with the drawings and specifications.

.2 Product acceptance will be based on quality assurance testing.

.3 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.

.4 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.

.5 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.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

END OF SECTION

1.0 GENERAL

1.1 CONTRACTOR'S GENERAL RESPONSIBILITIES FOR EXISTING UTILITIES

.1 The approximate location and elevation 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 There will be no separate payment for locating and protection of utilities; all costs associated with this work shall be considered incidental to this Contract.

.7 The Contractor shall not have any claim for compensation or damages against the Owner for any stoppage, delays, inconvenience or damages sustained by him due to any interference to the presence, adjustment, obtaining crossing agreements, or any coordination with any utility.

1.2 UTILITY CONTACTS

.1 ATCO ELECTRIC

Phone No.: 1-800-668-5506
Mr. Greg Smith, Operation Supervisor, Atco Electric
610-12 Street S.W. Drumheller, AB T0J 0Y0
Email: greg.smith@atco.com
Phone: 403 820-7503
Cell: 403 820-3593

.2 TELUS

Phone No.: 587-876-0715
Mr. Roger Medavarapu, Area Manager
Drumheller, AB T0J 0Y0
Email: roger.medavarapu@telus.com

.3 .APEX UTILITIES

Phone No.: 1-866-222-2067
Email: customercare@apexutilities.com

.4 TOWN OF DRUMHELLER

Phone No.: 403-823-6300
224 Centre Street
Drumheller, AB T0J 0Y4

1.3 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.

1.4 TEMPORARY SANITATION FACILITIES

.1 Provide separate sanitation facilities for male and female workers on the Site in accordance with the requirements of the local health authorities and following Covid-19 protocols. Provide any additional facilities required to suit construction operations or to satisfy the requirements of the local health authorities.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 GENERAL

.1 Provide and maintain temporary buildings required to perform the Work.

.2 Locate temporary buildings within the specified area.

1.2 SITE OFFICE

.1 Provide a Contractor's Site office. Within the office, provide a furnished room for holding Contract meetings.

1.3 FIRE PROTECTION

.1 Provide and maintain appropriate temporary fire protection equipment during the performance of the Work as required by Regulatory Requirements.

1.4 TEMPORARY FENCING

.1 Provide and maintain appropriate temporary fencing during the performance of the Work as required to isolate active construction areas.

.2 Provide and maintain appropriate temporary fencing around riprap stockpiles.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 TRAFFIC ACCOMMODATION STRATEGY

.1 Traffic Accommodation applies to road systems and trail networks. All accommodation must consider both vehicle and pedestrian impacts and mitigations.

.2 Provide a Traffic Accommodation Strategy detailing the measures proposed to safely accommodate the travelling public. The minimum requirements are specified in the Department manual: "Traffic Accommodation in Work Zones" (Latest Edition); Any Contract specific requirements, in excess of the minimum requirements, will be identified in this Section 01552.

.3 Provide a Traffic Accommodation Strategy consisting of drawings detailing the configuration of temporary construction signs and other traffic control devices at the Site and provide written confirmation of the methods or procedures being used by the Contractor to address specific traffic safety related issues or situations at the Site.

.4 When road and/or trail detours are required, ensure the Traffic Accommodation Strategy includes detailed drawings identifying the corresponding proposed traffic accommodation measures.

.5 Ensure any issues or concerns regarding the Contractor's proposed Traffic Accommodation Strategy are addressed to the mutual satisfaction of the Contractor and The Owner prior to the commencement of the Work.

.6 The Contractor shall have no claim against The Owner resulting from The Owner's failure to accept the Contractor's Traffic Accommodation Strategy submission.

.7 The Contractor is responsible for all costs to address concerns raised by The Owner during the review of the Contractor's Traffic Accommodation Strategy submission.

1.2 REQUIREMENTS FOR TRAFFIC ACCOMMODATION

.1 Unless otherwise specified, accommodate public traffic on a 24-hour per day basis using any means at the Contractor's discretion, subject to the minimum requirements of the "Traffic Accommodation in Work Zones" (Latest Edition).

.2 Make suitable provisions, including the use of detours, to accommodate all vehicular and pedestrian traffic safely and with a minimum of inconvenience.

.3 Provide, install, maintain and protect traffic control devices such as signs, barriers, fences and lights at the Contractor's expense and in accordance with Section 1.6 "Temporary Construction Signing".

.4 Install, maintain and protect at the Contractor's expense, any additional traffic control devices deemed necessary by The Owner.

.5 Provide the required number of flag persons, during all periods of active equipment operations which may affect normal traffic operations.

.6 Control the Contractor's operations to ensure normal school bus operations are not interfered with.

.7 Ensure uninterrupted access is provided to developments along the Site.

.8 Obtain prior approval from The Owner before changing or disrupting existing accesses and road crossings.

.9 Carry out construction operations in one continuous operation at road crossings, intersections and entrances for the Site.

.10 Provide and use such other methods or equipment necessary to accommodate public traffic safely.

.11 Promptly make any modifications to the traffic accommodation operations deemed necessary by The Owner. The Owner may suspend Work in accordance with Section 00725 – General Conditions, Clause 12.1, Suspension of Work, in cases where the Contractor fails to adequately provide for the safety of the public, for recurring safety issues or when the Contractor fails to comply with orders issued by The Owner regarding traffic accommodation operations.

.12 Remove or cover all traffic control devices when not essential for the safe accommodation of public traffic, in order to eliminate unnecessary inconvenience to the traffic.

.13 Coordinate traffic accommodation measures with those of other forces at or adjacent to the Work, as required, to accommodate public traffic safely and conveniently. This shall not relieve the Contractor of his responsibility for the safe accommodation of traffic over the wholeof the Site.

1.3 PUBLIC HIGHWAYS AND ROADS

.1 Comply with all requirements of the road authority having jurisdiction over public roads used by the Contractor in the execution of the Work including but not limited to road bans and Traffic Accommodation Strategy approvals.

.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 Before commencing the Work, conduct a detailed video and photographic survey, in the presence of The Owner, of the following facilities that are to be used. This survey establishes the restoration standard for such facilities. Submit a report to The Owner that summarizes the existing conditions and includes the photographs and video report.

.1 Public sidewalks, pathways, highways, roads and bridges

.2 Existing access roads including local roads and dike access roads upstream and downstream of the Site.

1.4 TEMPORARY ROADS

.1 Design and construct all temporary roads including access, haul and detour roads, temporary parking areas, 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 temporary roads when they are no longer required. Scarify, grade to original contours, cultivate, replace topsoil, and seed to grass.

1.5 TYPICAL DRAWINGS

.1 Drawings detailing minimum requirements for temporary signing and other traffic control devices for typical rural highway situations are contained in Section II of the Department manual entitled "Traffic Accommodation in Work Zones" (Latest Edition).

.2 Develop any drawings necessary to address non-typical rural or urban highway situations and include in the Traffic Accommodation Strategy.

1.6 TEMPORARY CONSTRUCTION SIGNING

.1 Materials

.1 Supply all signing materials including sign posts, weighted stands, brackets and any required mounting hardware and miscellaneous materials required for the erection of temporary construction signs.

.2 Provide signs, barricades and other traffic control devices conforming to the requirements for shape, colour and size specified in the Department manual entitled "Traffic Accommodation in Work Zones" (Latest Edition). Ensure the orange portion of all signs, barricades and other traffic control devices are fully reflectorized using High Brightness, Retroreflective, Non-Metallized, Prismatic Sheeting Material which incorporates durable, transparent, fluorescent pigment and meets the brightness requirements as specified in ASTM D4956 Type VIII sheeting. Unless otherwise approved by The Owner, ensure the orange coloured reflective sheeting supplied by the Contractor is one of the Proven Products for “Temporary Orange Work Zone/Construction Signs” listed on the Alberta Transportation Products List on the Department’s web site.

.3 Ensure all other colours of sheeting material are Type III or Type IV high intensity retroreflective sheeting meeting or exceeding the minimum requirements as specified in ASTM-D4956.

.4 Larger construction signs or oversized signs may be used where conditions require greater visibility in order to be effective. Use larger or oversized signs in special circumstances where more than average attention value is required from the sign.

.2 Equipment

.1 .1 Supply all equipment for Traffic Accommodation.

.3 Erection of Signs

.1 Do not commence work on the Site until all necessary temporary construction signs and all other traffic control devices as proposed in the traffic accommodation strategy are in place.

.2 When signs require frequent moves, portable type signs, mounted on weighted stands, may be used. Place portable signs on the shoulder of the road such that the face of the sign is fully visible to oncoming traffic and the bottom of the sign is not less than 300 mm above the road surface. Provide securely weighted stands and erect in a manner to ensure against being blown over by prevailing winds or gusts from passing vehicles.

.3 Ensure non-portable signs are conspicuously posted, and erected at right angles to the road, with the bottom of the sign at a height of 1500 mm above the road surface, and not less than 2000 mm or more than 6000 mm from the nearest traffic lane.

.4 Erect traffic signs and devices close to the construction work adjacent to the road, or the road work, in progress. Move them to remain close to the work with the progress of the construction.

.5 Mark objects within or immediately adjacent to the road which constitute a hazard to traffic with alternating black and orange stripes attached directly to the object or erected immediately in front of it.

.6 Ensure the use of signs is held to a minimum to prevent confusion.

.7 Install "STOP" signs on all subsidiary roads (local, district, municipal, service or approach) intersecting a primary highway detour route.

.8 Post speed zones, where required, as indicated on the applicable drawing contained in the "Traffic Accommodation in Work Zones” (Latest Edition).

.4 Maintenance and Removal of Signs

.1 Replace, repair or clean without delay any poorly maintained, defaced, damaged or dirty construction signs. Take special care to ensure that construction materials and dust are not allowed to obscure the face of a sign.

.2 Cover or remove signs not in effect and remove all construction signs after the Work is completed.

.5 Modifications to Temporary Construction Signing

.1 The Contractor is responsible for the supply and proper placement of temporary construction signs. However, in the case of potential danger to the traveling public or other circumstances where The Owner determines that signing is inadequate, The Owner will require changes to the Contractor's operations to remedy the situation. These changes may involve the use of different types and/or sizes of signs, modifying

the number or locations of signs, and any other modifications or additions required to protect the safety of the travelling public.

1.7 REMOVAL AND SALVAGE OF EXISTING SIGNS AND GUIDEPOSTS

.1 Salvage any existing signs and guideposts which must be removed during the execution of the Work. Maintain critical signs necessary for the protection of traffic such as railroad crossing signs or stop signs.

1.8 FLAGPERSONS

.1 General

.1 Provide flag persons when construction operations or Site conditions cause interruption, delay or hazard to the traveling public or anyone on the Site. Provide and equip responsible flag persons as necessary for the direction and control of traffic. Ensure that flag persons are instructed in and use proper traffic control procedures appropriate for the prevailing conditions.

.2 Ensure flag persons are certified from a recognized training program on traffic control procedures. The Owner will recognize traffic control programs administered by the Alberta Construction Safety Association, however The Owner reserves the right to accept or reject certification from any other institute.

.2 Safety Apparel

.1 Coveralls

.1 Ensure flag persons are dressed in coveralls which meet the Class 3 Level 2 requirements of CSA Z96-02, High Visibility Safety Apparel. Each pair of coveralls shall have a permanent label affixed certifying compliance with Class 3 Level 2 of CSA Z96-02.

.2 The colour of the coveralls shall be fluorescent yellow-green with silver retroreflective striping. The retroreflective striping shall be a minimum of 50mm wide, and shall be sewn onto a 100 mm wide fluorescent red-orange background material. Ensure flag person safety apparel are kept clean and in good condition at all times. Replace faded, torn and/or dirty coveralls, or coveralls without CSA certification labels.

.2 Headgear

.1 Prior to commencement of the Work, identify and assess existing and potential hazards at the Site. Where there is a foreseeable risk of injury to a worker's head, flag person's shall wear fluorescent orange protective hardhats meeting the requirements of CSA Standard Z94.1-92.

.2 Where no foreseeable risk of head injury exists, flag persons will be permitted to wear any type of fluorescent orange headgear.

.3 Night Time Operations

.1 During hours of darkness, equip flag persons with hand held red traffic signal wands of sufficient brightness to be clearly visible to approaching traffic. In addition, illuminate flagging stations by overhead lighting; and mark signs indicating hazardous conditions and signs requiring increased attention with flashers

1.9 DETOURS

.1 Design, construct, maintain and remove all detours required for the Work. Where necessary, provide any Environmental Authorizations, temporary relocation of any utilities and reclamation of the disturbed areas to a similar condition as existed prior to the disturbance. Do not construct Detours without the prior authorization of The Owner.

.2 Design, construction, maintenance, graveling, dust abatement, detour removal, reclamation and utility relocation will be considered incidental to the Work.

1.10 ROAD MAINTENANCE

.1 Obtain any necessary approvals from the agency having jurisdiction to haul materials or equipment over the proposed haul routes. Abide by all road restrictions and maintenance requirements established by the road or bridge authority having jurisdiction, including all roads and portions of the highway within the Site.

.2 When Contract generated Traffic disturbs public highways, roads and bridges, maintain and repair the roads and bridges at the Contractor's expense. In addition to the requirements of the road agency having jurisdiction, keep the disturbed areas of travelled lanes well graded and free of potholes, maintain surfacing gravel and replace when required, and control dust using water or other dust abatement material approved by The Owner. Following completion of the Work, restore the road to a condition as good as existed prior to the commencement of work.

.3 Carry out winter snow removal and ice control for traffic accommodation for public highways, roads and bridges within the Site.

.4 If the Contractor fails to promptly maintain the public highways, roads, and bridges The Owner may make other arrangements to have the Work done and deduct the cost thereof from any money owing to the Contractor.

1.11 PROLONGED SHUT DOWN

.1 Prior to any prolonged shut-down of construction, ensure that any disturbed road surface is restored to a condition suitable for traffic operations and acceptable to The Owner. Carry out winter snow removal and ice control for traffic accommodation for public highways, roads and bridges within the Site during the period of prolonged shut-down.

.2 Prior to commencing any prolonged shut-down of the Work, host a meeting between the Contractor and The Owner for the purpose of developing a "Shutdown Plan" based on the specific needs and requirements of the Site. The "Shutdown Plan" shall outline the Contractor's methods and procedures for monitoring and maintaining the Site during the shutdown period and will outline any responsibilities of the other parties.

.3 Notwithstanding the above, no component of the shut-down plan will negate the Contractor's responsibilities for the Contract.

1.12 MONITORING TRAFFIC ACCOMMODATION AT THE SITE

.1 To ensure the traffic accommodation strategy is performing as intended; monitor and maintain traffic accommodation measures at the Site on a regular basis. Designate a specific individual or individuals to perform this function to ensure any issues arising are addressed in a consistent and timely manner.

.2 The worker(s) carrying out the traffic accommodation monitoring shall be qualified, trained and experienced in traffic control and must be knowledgeable in the operation of the traffic control devices and other related equipment. Provide these workers with vehicles equipped with revolving warning lights and suitable communication devices to contact others for assistance if and when required.

.3 Monitor all traffic control devices, temporary signing and road conditions during periods of inactivity. Ensure the frequency of inspection is commensurate with the traffic volumes on the highway or road. For all detours, consecutive inspections will not be more than 6 hours apart, unless otherwise agreed by the Owner. Document all site inspections by the Contractor and make this information available for the Owner's review upon request.

.4 The traffic accommodation measures will be monitored by the Owner. If, in the opinion of The Owner, traffic is being unduly hindered, the Contractor may be required to modify his traffic accommodation measures.

1.13 COMPLIANCE

.1 In cases where the Contractor is not in compliance with the specifications and, in the opinion of the Owner there is imminent danger to the travelling public, the Owner has the authority to order the immediate suspension of Work. Such orders must be made in writing.

.2 In other cases where the Contractor is not in compliance with the specifications but, in the opinion of the Owner the infraction is not causing imminent danger to the travelling public, the Owner will use the following escalating process to address the situation:

.1 Issue verbal instructions requiring the Contractor to correct the infraction

.2 Issue a written warning instructing the Contractor to correct the infraction

.3 Issue a written order instructing the Contractor to suspend Work until the infraction iscorrected to the satisfaction of The Owner.

1.14 SUBMITTALS

.1 Provide the following submittals.

.2 Submit the Traffic Accommodation Strategy to The Owner 7 days prior to the pre-construction meeting for the Contract or to a schedule as agreed upon by The Owner. The Owner will review the Traffic Accommodation Strategy and communicate any concerns to the Contractor within 3 days of the pre-construction meeting.

.3 Plans showing the location of temporary access and haul roads and detours, drainage structures, and bridges required for execution of the Work, at least 10 days prior to commencement of the Work at the Site.

.4 Video Survey Report at least 14 days prior to commencement of the Work at the Site.

.5 Daily Records of Temporary Construction Signing

.1 Record the location of all temporary construction signs and any other traffic control devices used at the Site on a daily basis and as the Work Area changes. Record this information on a form suitable to The Owner and submit it to The Owner on a weekly basis or when requested.

.6 Plan showing the location of the proposed haul roads 7 days prior to the pre-construction meeting. The Owner will review the haul routes and communicate any concerns to the Contractor within 3 days of the pre-construction meeting.

.7 If required for a pro-longed shutdown period, submit a Shutdown Plan at least 14 days prior to the scheduled shutdown.

.8 Names of those workers who will be responsible for monitoring and maintaining the traffic control devices at the pre-construction meeting.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 References 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 Provide the following submittals.

.2 When requested by The Owner, a complete description of the procedures for installing the product.

.3 When requested by The Owner, appropriate design calculations for the products to be installed.

.4 Products List, complete with the product name, model number, manufacturer's name, and applicable Specification section for each item listed, within 15 days of the date of commencement of the Contract. A form of Products List is appended to this section.

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.

2.0 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.

3.0 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 INSTALLATIONS 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.

3.3 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

1.0 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 clause 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 Where Substitute Manufacturers are permitted, unnamed manufacturers will be authorized by The Owner, subject to the following:

.1 Substitute Manufacturers shall have capabilities comparable to those of the named manufacturer(s). Substitute Manufacturers shall not require revisions to the Contract Documents nor to work of Other Contractors.

.3 Do not order or install Substitutions without The Owner's authorization.

.4 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 clause 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.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 SURVEY REFERENCE POINTS

.1 Primary horizontal and vertical survey reference points are provided in the Contract Documents.

.2 Locate, confirm, and protect primary reference points prior to starting Work on the Site. Preserve permanent reference points during construction.

.1 Make no changes to or relocations of the primary survey reference points without prior writtenauthorization of The Owner.

.2 Report to The Owner when a reference point is lost or damaged or requires relocation because of the Work.

.3 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.

.1 Record survey data in accordance with standard survey methods in a form acceptable to TheOwner.

.2 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.

.3 Establish lines, grades, and elevations, and locate and lay out the Work.

.4 Provide final grade staking of each line, grade or elevation required for The Owner's checkingof 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 untilThe Owner has authorized their removal.

.5 Provide such assistance as may be required by The Owner for carrying out surveys in clause1.3.

.6 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 ofall 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 atthose locations.

.2 The Owner will carry out surveys for the purpose of measuring the Work for payment.

1.3 OWNER SURVEY REQUIREMENTS

.1 The Owner may carry out surveys, as The Owner deems necessary, to check the accuracy of the Contractor's layout, stakes, and measurement.

2.0 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.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

END OF SECTION

1.0 GENERAL

1.1 GENERAL

.1 Perform final cleaning operations prior to the request for inspection for Substantial 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.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 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 of the Work.
- .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 of the Work.
- .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 of the Work.

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 Commissioning.
- .2 Obtain and submit evidence of compliance with Regulatory Requirements, including:
  - .1 Health and Safety records.

.2 ECO Inspection and Maintenance records.

.3 Remove from the Site temporary facilities along with construction tools, equipment, mock-ups, and similar items.

.4 Complete final clean-up.

.5 Submit Contract Record Documents.

.6 Submit Operation and Maintenance Data.

.7 Submit product warranties and extended warranties when specified in the Contract Documents.

.8 Provide spare parts and maintenance products.

.9 Make final change-over of locks and transmit keys to The Owner.

.10 Complete installation of architectural finish items, including all mechanical and electrical covers and trims.

.11 Correct all Contract Deficiencies that may affect operation of the facility.

.12 Complete the Work and have it ready for the purpose intended.

.13 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.

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 the inspection, The Owner will:

.1 issue a Certificate of Substantial Performance of the Work stating the effective date of Substantial Performance, with a copy of the SPC Deficiency List attached (A form of a Certificate of Substantial Performance is appended to this section); or

.2 advise the Contractor that prerequisites to Substantial Performance are not fulfilled and repeat the inspection for Substantial Performance as necessary.

.2 Upon issuance 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 Dike operation, including all systems and equipment.

1.6 PREREQUISITES TO TOTAL PERFORMANCE

.1 Prior to requesting The Owner's inspection for Total Performance carry out the following:

.1 Maintenance of the dike including all landscaping works

.2 Perform the entire Work, including the correction of all Contract Deficiencies, except those items arising from the warranty provisions of the Contract Documents.

.3 Removal of all ESC and ECO plan items

.4 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 Issue a Certificate of Total Performance of the Work, stating the effective date of Total Performance (A form of a Certificate of Total Performance is appended to this section), or;

.2 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 2 year warranty period; and

.3 correction of items arising from the warranty period required by the Contract Documents.

1.10 INSPECTION FOR WARRANTY PERFORMANCE

.1 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 (A form of a Certificate of Warranty is appended to this section); or

.2 advise the Contractor of items that must be corrected prior to issuance of the Certificate of Warranty Performance of the Work.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

SUBSTANTIAL COMPLETION CERTIFICATE

DATE ISSUED:	DATE OF SUBSTANTIAL PERFORMANCE:
TOWN BUSINESS UNIT:	PROJECT TITLE:
TOWN REPRESENTATIVE:	PURCHASE ORDER NUMBER:
CONTRACTOR:	DESIGN PROFESSIONAL (IF APPLICABLE):
This *Substantial Completion Certificate* acknowledges that *The Town* has received a *Certificate of Substantial Performance* from the *Contractor*, and that, in the opinion of the *Contractor, Substantial Performance* of the *Work* has been achieved. In addition, the *Contractor* has satisfied all requirements. By executing this form, *The Town Representative* acknowledges that *Substantial Performance* of the *Work*, as per the *Builders' Lien Act*, has been achieved and that all liens have been discharged against the *Project*.	

WARANTY PERIOD

WARANTY PERIOD COMMENCEMENT:	Upon issuance of Substantial Completion Certificate (see DATE ISUED above)
WARRANTY PERIOD TERMINATION:	Upon issuance of the Final Acceptance Certificate by the Town Representative, anticipated
WARRANTY PERIOD DURATION:	

AMOUNT PAYABLE AT SUBSTANTIAL PERFORMANCE

STATUTORY HOLDBACK TO BE RELEASED:	
GST:	
TOTAL PAYABLE AT SUBSTANTIAL PERFORMANCE:	
TOWN REPRESENTATIVE'S COMMENTS:	

TOWN REPRESENTATIVE AUTHORIZATION

RECOMMENDED BY THE TOWN			
DESIGN PROFESSIONAL (if applicable)	PRINT NAME	SIGNATURE	DATE
TOWN REPRESENTATIVE	PRINT NAME	SIGNATURE	DATE
Note: In the event that there is a conflict in the defined terms, the meanings as ascribed in the Agreement shall prevail.			

[CONTRACT NAME]

TOWN OF DRUMHELLER
CERTIFICATE OF TOTAL PERFORMANCE

Tender No.: [ ]
Contract No.: [ ]

Contractor:
Address:

Owner: Town of Drumheller [ ]
Address: 702 Premier Way, Drumheller, Alberta T0J 0Y0

This Certificate of Total Performance is issued pursuant to clause 6.10 Section 00725 - General Conditions and clause 1.8 Section 01775 - Contract Acceptance Procedures ofthe Contract Documents.

The Work performed under the Contract has been reviewed, and to the best of the Town of Drumheller's knowledge meets the requirements for Total Performance of the Work. Pursuant to clause 1.7 of Section00725 – General Conditions, any review, comment, consent, acceptance or approval, or lack thereof, bythe Town of Drumheller shall not relieve the Contractor of any of its responsibilities or liabilities under theContract.

The effective date of Total Performance of the Work is ____Click here to enter a date.____

CONSULTANT'S RECOMMENDATION

I have reviewed the Certificate and recommend it for authorization by the Town of Drumheller.

Click here to enter a date.

Signature of Consultant's Authorized Representative

Printed name of the above representative Printed name of Consultant Firm

TOWN OF DRUMHELLER'S AUTHORIZATION

I authorize this Certificate of Substantial Performance of the Work.

Click here to enter a date.

Signature of Town of Drumheller's Authorized Representative

Printed name and title of the above representative

[CONTRACT NAME]

TOWN OF DRUMHELLER

CERTIFICATE OF WARRANTY PERFORMANCE

Tender No.: [ ]
Contract No.: [ ]

Contractor:
Address:

Owner: Town of Drumheller [ ]
Address: 702 Premier Way, Drumheller, Alberta T0J 0Y0

This Certificate of Warranty Performance is issued pursuant to clause 6.11 Section 00725 - General Conditions and clause 1.11 Section 01775 - Contract Acceptance Procedures of the Contract Documents.

The Work performed under the Contract has been reviewed, and to the best of the Town of Drumheller'sknowledge meets the requirements for Warranty Performance of the Work. Pursuant to clause 1.7 of Section 00725 – General Conditions, any review, comment, consent, acceptance or approval, or lack thereof, by the Town of Drumheller shall not relieve the Contractor of any of its responsibilities or liabilitiesunder the Contract.

The effective date of Warranty Performance of the Work is Click here to enter a date.

CONSULTANT'S RECOMMENDATION

I have reviewed the Certificate and recommend it for authorization by the Town of Drumheller.

Click here to enter a date.

Signature of Consultant's Authorized Representative

Printed name of the above representative

Printed name of Consultant Firm

TOWN OF DRUMHELLER'S AUTHORIZATION

I authorize this Certificate of Substantial Performance of the Work.

Click here to enter a date.

Signature of Town of Drumheller's Authorized Representative

Printed name and title of the above representative

1.0 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.

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 OR electronic means 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.

.8 All records kept by the contractor are to be made available for review and inspection by the Owner or its representatives at all times.

1.4 SUBMITTALS

.1 Provide the following submittals.

.2 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. No failure of the owner

or its representative shall relieve the contractor of its responsibility to construct the work in accordance with the drawings and specifications.

.3 Completed Contract Record Documents before or with the request for inspection for Substantial Performance.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION

1.0 GENERAL

1.1 SUBMITTALS

Provide the following submittals

.1 Submit copies of permits or licenses for off-Site disposal of materials and debris.

.2 A list of proposed temporary storage locations for salvaged materials at least 7 days prior to commencing salvage activities.

1.2 WORK SEQUENCING

.1 Commence demolition and salvage work as specified in Section 01110 – Summary of the Work and project Drawings.

.2 Sequence demolition of any existing culverts/pipes and construction of the new culverts/pipes such that existing areas remain free draining at all times.

1.3 RECYCLABLE MATERIALS

.1 Unless specified otherwise in this section, all materials indicated or specified to be permanently removed or demolished from the Site become the property of the Contractor. Maximize the recycling of such materials, consistent with proper economy and expeditious performance of the Work.

2.0 EXECUTION

2.1 GENERAL

.1 Prior to commencing demolition and salvage, inspect the Site and verify with the Owner and Engineer of Record items designated for demolition, salvage, and removal.

.2 Locate and protect existing utility lines, survey reference points, instrumentation, and other facilities that are to remain in place before commencing the Work.

.3 If any Utility service lines are connected to the items to be demolished or salvaged, confirm with the Utility that the service lines are not in operation, or make arrangements with the Utility to shut down the service lines.

.4 All work is to conform with Regulatory Requirements, including safety requirements established by the Occupational Health and Safety Act (Alberta).

.5 At the end of each shift, leave the work in a safe and stable condition, so that no part of it is in danger of toppling, falling, or sliding. Site safety and security is the responsibility of the Contractor.

.6 Do not use blasting to perform demolition work. Burning of disposal materials in not permitted on-Site.

.7 Perform work in a manner that prevents the loss or damage of materials specified for salvage. Repair or replace damaged materials as required by the Owner or Engineer of Record.

2.2 EXCAVATION AND BACKFILL

.1 If required, provide excavations of sufficient width and depth to permit demolition and salvage, and subsequent placement of fill materials as specified in the Contract Documents. Perform excavations in accordance with Section 02315 – Excavation and backfill in accordance with Section 02331 - Fill Placement.

2.3 DEMOLITION AND REMOVAL OF STRUCTURES

.1 Demolish and remove the following existing structures. Note some structures may be partially demolished:

Existing Structure	Approximate Station
Headwall (9)	1+350, 2+050, 2+140, 2+207.68, 2+260, 2+580, 2+650
Concrete pipe (3)	1+350, 2+140, 2+260
CSP pipe (1)	2+580
PVC pipe (1)	2+650
Asphalt Pathway	1+100 to 1+500 2+000 to 2+800
Grated Inlet	2+580

2.4 MATERIALS TO BE SALVAGED BY THE CONTRACTOR AND REINSTALLED (IF DEEMED SUITABLE FOR RE-USE)

.1 The Contractor is to remove the following structures and reinstall at a location specified by the Owner and Engineer of Record (if deemed suitable for re-use by the Owner and Engineer of Record).

Existing Structure	Approximate Station	Note
Memorial Benches (5)	1+200, 1+300, 2+000,	Remove as required to perform work and reinstall
Garbage Bins	1+300	Remove as required to perform work and reinstall
Sign	1+300	Salvage and reinstall
Flap Gate (9)	1+350, 2+050, 2+140, 2+210, 2+260, 2+580, 2+650	Salvage and reinstall/return to the Owner
Chain Link Fence	2+450	Salvage and reinstall

.2 Salvage the following materials (if required) and re-use as directed by the Owner and Engineer of Record.

.1 Removed concrete manhole and catch basin slabs, barrels, lids, frames, and covers should be reviewed by the Engineer of Record to determine if they can be salvaged and reincorporated into the Work.

.3 Neatly roll, bundle, or crate salvaged materials and store in an orderly fashion at storage location approved by the Owner and Engineer of Record. Collect smaller items, such as bolts, in suitable containers and label the containers accordingly.

2.5 DEMOLITION OF CONCRETE STRUCTURES

.1 Demolish and remove any existing concrete structures where specified in the Contract Documents.

.2 Demolish concrete into individual pieces with a maximum size of approximately 0.5 m^3.

.3 If applicable, cut exposed reinforcing steel to within 25 mm of the concrete surface and dispose of reinforcing steel off-Site.

2.6 DISPOSAL

.1 Remove demolished materials at an appropriate recycling facility, or at an appropriate off-Site waste disposal facility.

2.7 CLEAN-UP

.1 Finish the demolition work areas to a leveled and neat condition.

END OF SECTION

1.0 GENERAL

1.1 NOTE

.1 Tree and brush clearing has been completed through a separate contract. Work anticipated involves grubbing and removal of tree stumps and roots. If additional tree felling is identified as being required, it will be managed as a Change.

.2 If required, trimming Elm trees can only be done between October 1 to March 31 of the subsequent year. All Elm trees identified for removal to construct the Work have been cleared and disposed of under a separate contract.

1.2 SUBMITTALS

.1 Submit a Work Plan outlining the beneficial re-use of mulched clearing materials if mulching is to be proposed on-site.

2.0 EXECUTION

2.1 PREPARATION

.1 Protect trees, shrubs, and other vegetation within the specified site clearing and grubbing areas that are designated to remain in place, against unnecessary cutting, breaking, and any other damage.

.2 Protect from damage all existing infrastructure and landscaping including, fences, roadways, and other existing site improvements within the specified site clearing and grubbing areas that are designated to remain in place.

.3 Protect survey reference points from damage.

.4 All equipment entering the project site must be cleaned before arrival to prevent the spread of weed species

2.2 REMOVAL

.1 Remain in compliance with the Migratory Birds Convention Act and the Alberta Wildlife Act.

.2 Remove all logs, trees, brush, stumps, roots, and other deleterious material from the specified areas except for trees or vegetation designated to be preserved.

.3 Remove all roots and other deleterious materials to 1 m below the ground surface or to the satisfaction of the Engineer.

.4 Limbing of tree branches that extend into the specified clearing area is not required.

.5 For trees that are designated to remain, cut only roots or branches that interfere with the Permanent Work and treat the roots or branches with a non-toxic horticultural emulsion authorized by the Owner.

2.3 DISPOSAL

.1 Burning is not permitted on the Site. Load, transport, and dispose of debris at the Eladesor disposal site (Lat: 51.402 deg N, Long: 112.592 deg W), or otherapproved off-Site waste disposal facility.

.2 Mulching on-site may be considered with prior approvals obtained from the Owner. Mulching will only be considered where the beneficial re-use of the resultant materials can be demonstrated by the Contractor.

2.4 SUPPLEMENTARY - ENVIRONMENTAL

.1 The following environmental specifications are not anticipated to be required in this contract but are to be adhered to as applicable to a Change.

.2 Black Knot Fungus: To control the spread of black knot fungus, caused by Dibotryon morbosum or Apiosporina morbosa, contractors must develop and implement a site-and species-specific weed management plan, as per Alberta Weed Control Act and Weed Control Regulations. A localized weed survey is to be conducted between June and August at construction sites and along equipment movement corridors to identify any weed species present. All equipment entering the project site must be cleaned before arrival to prevent the spread of weed species. Removing and destroying wood infected with black knot fungus is the only way to control the disease once it is present. If black knot fungus is identified, the diseased wood must be immediately removed and disposed at the Town landfill facility.

.3 Dutch Elm Disease: To control the spread of Dutch Elm Disease, caused by Ophiostoma ulmi or Ophiostoma nova-ulmi, European Elm Bark Beetle (Scolytus multistriatus) and Native Elm Bark Beetle (Hylurgopinus rufipes), contractors must develop and implement a site-and species-specific weed management plan, as per Alberta Weed Control Act and Weed Control Regulations.

The Contractor shall carry out their operations in accordance with the provisions in the attached Alberta Government Dutch Elm Disease Prevention and Control Plan and the Best Management Practices outlined in the Alberta Dutch Elm Disease Prevention and Control Plan Management Plan which is available on-line at the following location:

http://www.alberta.ca/dutch-elm-disease.aspx
http://www.alberta.ca/dutch-elm-disease-prevention-what-you-can-do.aspx

Removing and destroying wood infected with Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle is the only way to control the disease once it is present. If Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle is identified, the diseased wood must be immediately removed and disposed of, by burial, to prevent spread. The Owner has established designated sites for the disposal of Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle. The Contractor shall haul any Dutch Elm Disease / European Elm Bark Beetle / Native Elm Bark Beetle found on Site and removed to a designated burial site for disposal.

END OF SECTION

1.0 GENERAL

1.1 DEFINITIONS

.1 "Topsoil" is the soil material as described below.

.1 Earthwork materials with an organic content.

.2 The uppermost part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils, and normally ranging in depth from 50 mm to 400 mm.

.2 "Subsoil" is the soil material identified as the weathered soil material found beneath the topsoil. The subsoil thickness is to be considered the layer of soil that is found to be excessively desiccated, weathered, oxidized and/or contains a noticeable fraction of organics. F

1.2 REFERENCES

Provide Topsoil and Subsoil stripping in accordance with the following standards except wherespecified otherwise:

.1 Alberta Transportation

.1 Pre-Disturbance Assessment Procedures for Borrow Excavations for Road Construction.

1.3 PRE-DISTURBANCE ASSESSMENT BY THE OWNER AND THE CONTRACTOR

.1 The Owner or Engineer of Record are to complete a pre-disturbance assessment with the Contractor prior to commencing with topsoil and subsoil stripping at the Midland project location. This assessment is to define the areas of allowable disturbance, the controls that will be utilized to prevent disturbance beyond these limits and the thickness ofthe topsoil and subsoil deposits.

.2 The installation of controls at the identified disturbance limits, at the Midland project location, is to be the responsibility of the Contractor.

2.0 EXECUTION

2.1 PREPARATION

.1 Locate and protect utility lines, survey reference points, instrumentation, culverts, and all other existing facilities before commencing stripping operations.

.2 Abandoned irrigation lines may be encountered within the project development footprint during stripping. These abandoned irrigations lines are to be removed and disposed of as identified in Section 02220 – Demolition, Salvage, and Removal.

.3 Specific utilities may require crossing agreements and further protection at specific crossing locations. The specific requirements and utility crossing protective measures are to be determined and implemented by the contractor with approval from the Utility Owner and Owner of the public or private lands which occupy the subject utility.

2.2 STRIPPING

.1 Do not strip any area without prior authorization from the Owner.

.2 Do not disturb grassed or natural areas and do not drive on areas outside of the established disturbance limits. Stay on temporary access and haul roads, and detours; and construction facilities/areas, lay down and parking areas.

.3 Strip Topsoil and Subsoil in an unfrozen condition.

.4 Strip Topsoil and Subsoil from the areas where Common Excavation and Fill Placement are required.

.5 Strip Topsoil from temporary access and haul roads; detours; construction facilities/areas; lay down areas; parking and site office areas; and stockpile areas including Topsoil stockpiles; and any other areas as required by the Owner.

.6 Strip Topsoil and Subsoil fully from the receiving surface. The depths provided in the Contract Documents are intended to provide an initial estimate. All Topsoil and Subsoil material must be removed prior to fill placement.

.7 Strip Topsoil and Subsoil separately to prevent mixing.

.8 Strip Subsoil after the Topsoil has been removed.

.9 Sequence, stagger, and conduct stripping and excavation operations so that undesirable materials do not become mixed with Topsoil or Subsoil.

.10 Any Topsoil or Subsoil materials that are found to be contaminated are to be stockpiled separately and are not to be mixed with uncontaminated Topsoil or Subsoil stockpiles.

.11 Use equipment with precise depth control when stripping shallow or variable depths of material, to limit over excavation.

.12 Suspend stripping operations during rain, snow, wet ground conditions, high winds, or other conditions that may result in contamination or loss of material.

.13 Drain surface water away from the stripped areas to prevent ponding and infiltration in fill placement areas.

2.3 STOCKPILING

.1 Stockpile Topsoil from Common Excavation, Structure Excavation, and fill placement areas adjacent to the stripped area and within the Site Disturbance Limits as authorized by the Owner.

.2 Stockpile Topsoil from temporary access and haul roads; detours; construction facilities/areas, lay down, parking, and site office areas, and stockpile areas except for Topsoil stockpiles, adjacent to the stripped area and within the Site Disturbance Limits as authorized by the Owner.

.3 Stockpile Subsoil from the project location excavation areas adjacent to the stripped area and within the Site Disturbance Limits, or in the temporary construction laydown, as authorized by the Owner.

.4 Subsoil removed from the project location should be assumed to be waste soil and is to be disposed of as specified within Section 02332 – Waste Fill Placement. Subsoils may also be used for surficial grading in areas above the Impervious Fill Zone 1A, outside of the dike footprint and where grade supported structures are not proposed to be installed.

.5 Separately stockpile Topsoil and Subsoil.

.6 Maintain a minimum separation of 3 m between stockpiles of differing materials.

.7 Provide erosion control measures as indicated in the ECO Plan in Section 01390 – ECO Plan to prevent soil loss from the Topsoil and Subsoil stockpiles due to wind or water erosion. Where Topsoil is to be stockpiled for periods exceeding 1 growing season, protect the stockpile from erosion by providing a cover crop or other measures as authorized by the Owner.

.8 Do not interfere with drainage courses with stockpiled material. Keep stockpiles a minimum distance of 15 m from a river, stream, lake, reservoir or other surface bodies of water.

.9 Do not stockpile material at slopes steeper than 3H:1V.

.10 Do not stockpile material near riverbank slopes or other sloping ground to avoid triggering potential slope instability.

.11 Maintain stockpiles in a condition meeting the above requirements.

END OF SECTION

1.0 GENERAL

1.1 NOTES

.1 This specification should be read in conjunction with Section 02242 – Turbidity Barriers and Monitoring.

.2 At the time of Tender, permits pertaining to instream work have not been obtained and are outstanding. Instream work is not permitted to take place until permits have been obtained by the Owner.

1.2 REGULATORY REQUIREMENTS

.1 Comply with the conditions of the permits for the Project obtained by the Owner under the Fisheries Act and the Water Act as specified in Section 01410 – Regulatory Requirements.

.2 Make arrangements with the Owner, landowners, or other agencies that may be affected by disposal of water, snow, or ice. Obtain any permits required in addition to those obtained by the Owner.

1.3 SITE CONDITIONS

.1 The Site is located in an area where chinook winds, accompanied by sudden temperature changes, are prevalent. The resulting temperature fluctuations often result in significant snowmelt runoff during relatively short periods of time.

.2 Flows in the Red Deer River, local ditches and drainage courses may occur or vary at any time due to natural runoff, snowmelt or diversions. Red Deer River conditions that may influence care of water provisions are specified in Section 01110 – Summary of Work.

.3 The Site is located where groundwater is present. Take adequate measures to protect the quantity and quality of groundwater resources.

1.4 DESIGN OF CARE OF WATER PROVISIONS

.1 Design temporary care of water measures including cofferdams, sumps, pumping systems, pipelines, channels, flumes, drains, and other protective and dewatering works to permit construction of the Work in a manner that allows for constructability in the dry and maintains environmental compliance.

.2 Include provisions for handling groundwater, rainstorm runoff, snow, snowmelt, and ice that may enter the Work areas in the design of the care of water measures.

.3 Accommodate drainage, runoff, stormwater or snowmelt flows, leakage or other flow originating from within or beyond the Site. Accommodate flow or leakage from other works, municipal operations, street drainage, stormwater infrastructure or other existing facilities or activities.

.4 Do not allow construction operations to interfere with existing drainage conveyance or to restrict overland flow or storm sewer drainage. Convey discharge downstream according to existing facilities or activities.

1.5 SUBMITTALS

.1 Provide the following submittals.

.1 A care of water plan, including Site specific drawings, outlining the care of water provisions designed as specified in clause 1.4 at least 10 days prior to commencing Work at the Site.

.2 A copy of each permit obtained (in addition to those obtained by the Owner) upon the Owner's request.

.3 Water quality tests if requested by the Owner.

1.6 QUALITY CONTROL

.1 See Section 02242 – Turbidity Barriers and Monitoring.

1.7 QUALITY ASSURANCE

.1 See Section 02242 – Turbidity Barriers and Monitoring.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION

3.1 GENERAL

.1 Provide, operate, and maintain all necessary cofferdams, channels, flumes, drains, well points, wells, sumps, pumps, pipelines, and other temporary diversion and protection works.

.2 Provide, operate, and maintain all cold weather protective works including enclosures, insulation, and heating systems when weather conditions are conducive to formation of ice and frost.

.3 Have at Site at all times and ready for immediate use, at least one standby pump for each category of pump being used for care of water.

.4 Provide standby power sufficient for operation of all required care of water equipment.

.5 Inspect care of water pump and pipeline systems at regular intervals not exceeding 12 hours and verify that the pumps are operating, there is sufficient fuel, and cold weather protection is adequate. If required, decrease the time interval between inspection check to correspond with the type and nature of weather and the work in progress, to the satisfaction of the Owner.

.6 Repair damage to any part of the Work caused by water, snow, or ice due to failure of the care of water measures. Perform additional excavations and fill placement made necessary by water, snow, or ice.

.7 When no longer required, remove cofferdams, sumps, channels, drains, and other protective, dewatering, and temporary diversion works and finish to a leveled and neat condition.

3.2 ENVIRONMENTAL PROTECTION

.1 Do not use care of water measures that cause pollution.

.2 Do not cause damage to property or nuisance on roads, or injury to the public or to wildlife due to discharge of water from the care of water measures.

.3 Provide and maintain sediment ponds or other means to remove sediment from the water prior to allowing it to enter or return into the watercourse. Dispose of sediments in waste disposal areas.

END OF SECTION

1.0 GENERAL

.1 The Contractors operations will be subject to the maximum allowable increase in total suspended solids (Max-TSS) within the watercourse.

1.2 DEFINITIONS

.1 “Instream Construction Activity” means any planned instream construction activity below the high water mark that has the potential to result in additional turbidity in the watercourse. This would include the installation and removal of isolation measures (i.e., cofferdams, berms, silt curtains, etc.), placing of riprap in the water, bank excavation, etc.

.2 “Max-TSS” means the maximum allowable increase of total suspended solids in the watercourse from the levels at the compliance point downstream of the turbidity control structure from those immediately upstream of the worksite containment.

.3 “Isolated Construction Activity” means any planned construction activity that occurs when working in-stream within a stable site isolation measure (i.e., cofferdams, berms, silt curtains, etc.).

.4 “Site Isolation” means the placement, erecting or installation of a system whose function is to assure sediment produced from construction activities is contained to the isolated work site.

.5 “Visually Conspicuous Plume” means a plume of suspended solids that can be visually observed in the watercourse.

.6 “Normal Construction Activity” means any construction activity that will not cause elevated turbidity levels, and no visual indications of elevated turbidity levels.

.7 “Scheduled Construction Activity” means any planned activity that can be expected to result in additional turbidity in the watercourse, including the installation and removal of cofferdams, silt curtains, placing of riprap in the water, grading, etc.

.8 “Accidental Occurrence” means any situation, beyond the Contractor’s control, that results in elevated turbidity levels in excess of the specified compliance limits, including situations like the unexpected breaching of a cofferdam due to flood conditions exceeding the design levels.

1.3 SAMPLING AND TESTING (QUALITY CONTROL AND QUALITY ASSURANCE)

.1 Perform all sampling and testing of Total Suspended Solids (TSS) as specified herein or as specified in the project authorizations.

.2 Provide copies of the results of all sampling and testing in a daily summary format. Upon completion of Construction Activities, submit a final report containing all sampling and testing data.

.3 The Owner will carry out random quality assurance inspection as a means to monitor the Contractor’s quality control program. Assist and cooperate with the Owner during the collection of water quality samples.

.4 Prior to the start of construction, carry out sufficient testing to determine the normally occurring linear relationship between Total Suspended Solids (TSS) and turbidity in the watercourse as per the "Conversion Relationship between Nephelometric Turbidity Units (NTU) into mg/L for Alberta Transportation's Turbidity Specification". Pay services of a qualified laboratory to determine the relationship.

.5 Submit laboratory results and the linear relationship to the Owner's representative for review prior to initiating the program.

.6 During construction, perform the following:

.1 Measure the suspended solids in NTU accurate to within 2% of the calibration solution of the equipment.

.2 Convert NTU into mg/L to establish the relationship specific to the site.

.3 Measure upstream and downstream NTU levels within a maximum period of 30 minutes of each other, or as directed by the Owner, unless there is a sediment release (see monitoring frequency below).

1.4 SAMPLING FREQUENCY

.1 Perform sampling 30 minutes prior to daily construction activities until 30 minutes after construction activities have been completed. Compile all sampling information in a daily report.

.2 Perform total suspended solid sampling at the following frequency:

Site Condition	Monitoring Frequency
Instream Construction Activities and Accidental Occurrences	• During construction hours, sample at a minimum of once every hour at all compliance transects. • If an exceedance or plume is observed, sampling shall be done within the plume until TSS levels have returned to acceptable background levels for two consecutive sampling events. • No sampling events shall occur during Accidental Occurrences until it is safe to do so.
Isolated Construction Activities	• When the Contractor is working within site isolation samples will be taken at all transects at three hour intervals, during construction hours. • If sample results have not exceeded 5 mg/L above background levels for five consecutive active construction days, the sample frequency may be reduced to a minimum of twice per day, as directed by the Owner.

1.5 COMPLIANCE MONITORING

.1 For watercourses less than one meter in depth, take one measurement at 50% of the depth for each sample point along the transect. For watercourses greater than one meter in depth, take two measurements, one at 20% depth and one at 80% depth at each sample point along the transect, and average the results.

.2 The following table summarizes the compliance monitoring locations for the Red Deer River.

Type of Watercourse	Number of Transects	Sample Points Along Transect
Red Deer River	Background: upstream of the work area	25%, 50%, 75% of wetted width at each transect
	Transect 1: 1 stream width from work area	
	Transect 2: 2 stream widths from work area	
	Transect 3: 3 stream widths from work area	

1.6 VISUAL PLUME MONITORING

.1 In the event that Visually Conspicuous Plume is observed, immediately cease all activities, undertake mitigation measures, contact the Owner, and promptly initiate a plume TSS monitoring program in accordance with the following;

.1 Cease all activities that may have a direct or indirect effect on water quality during all plume ocurrences.

.2 Take a sample from the middle of the plume and as close to the source of the plume as possible (within safety limits)

.3 Monitor at all transects and the plume sampling point as often as feasible (a minimum of an hourly basis), and continue until two consecutive monitoring events show no compliance exceedances.

1.7 COMPLIANCE CRITERIA

.1 Criteria are set by the current versions of the Environmental Quality Guidelines for Alberta Surface Waters, which are based on the Canadian Council of Ministers of the Environment.

.2 Following completion of each TSS monitoring event, the Contractor will know if the construction activities are within compliance limits as defined in the table below. This will be accomplished as follows;

.1 Average the results for each of the upstream sample points to determine a background TSS (mg/L) for each event.

.2 Calculate the average TSS concentration (mg/L) for each of the downstream transects (cross sections) and compare the average value for each transect to the background TSS concentration (mg/L). If the result for any transect exceeds the limits in the table below, the project is not in compliance. The average value for any transect is calculated as the arithmetic average of the sample points in that transect.

.3 Compare any differences with the TSS Compliance Criteria to determine if the construction works (i.e. isolated or instream construction activities) are within compliance.

.3 Utilize equipment, labour, and procedures in a manner that ensures the maximum allowable levels of suspended solids are maintained below the following levels;

Site Conditions (Background TSS)	Exceedance Levels (TSS in Excess of Normal Background Levels)
TSS < 25 mg/L	• A maximum instantaneous increase of 25 mg/L over background levels at any time. • An average increase of >5 mg/L over background levels for more than 24 hours.
TSS 25 mg/L – 250 mg/L	• A maximum instantaneous increase of 25 mg/L from background levels at any time.
TSS > 250 mg/L	• A maximum instantaneous increase of 10% of background levels at any time.

.4 Notify the Owner at least 72 hours (3 calendar days) prior to the start of any Instream Construction Activity.

.5 In the event of a measurement is over the Exceedance Levels listed in the table above, or an Accidental Occurrence that results in a Visually Conspicuous Plume of sediment, cease all activities that may have a direct or indirect impact on water quality, and immediately initiate mitigation actions. Notify the Owner immediately and call the Alberta Energy and Environment Response line at 1-800-222-6514.

.6 If an exceedance occurs during Isolated Construction Activity and a reduced sampling program is in effect, the sampling frequency must be reset to the requirements, as listed in the sampling frequency table of clause 1.4.2, where the sampling frequency is to return to three hour intervals during construction hours.

1.8 RECORD KEEPING

.1 Keep a detailed record of the sampling completed for the TSS monitoring program during Instream Construction Activity and Isolated Construction Activity and report to the Owner in a weekly summary format.

.2 Ensure daily sampling records are up-to-date and keep onsite at all times during the period in which the monitoring program is in effect.

.3 Upon completion of the Construction Activities, submit a final report containing all sampling and testing data to the Owner.

.4 Include the following items in the weekly summary report;

.1 Brief description of the works and types of construction activities completed during the sampling.

.2 Date and time of each sample.

.3 Weather conditions at the time of each sample.

.4 Changes of depth of flow at the upstream transect.

.5 Documentation of daily NTU instrument calibrations.

.6 Both turbidity (NTU) and TSS (mg/L) for each sample taken.

.7 The daily average value (mg/L TSS) of the upstream background samples.

.8 The daily average value (mg/L TSS) of each downstream transect (all three sites per transect combined).

.9 Documentation of all non-compliance instances, including the level of exceedance, the duration of exceedance, the mitigation measures taken, verification of the reporting of the exceedance and any related communications with regulators regarding the exceedance event, and future measures to be taken to avoid or control further exceedances.

.10 Description of events or circumferences that may have prevented or hindered completion of the TSS monitoring program.

1.9 SUBMITTALS

.1 Provide the following submittals:

.2 Shop Drawings of the turbidity barriers detailing the components and the material specifications of the components, 15 days prior to commencement of the Work. Provide a turbidity barriers system that has been designed and stamped by a professional Engineer registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta or a specialist in such Work authorized by the Owner.

.3 Turbidity Control Execution Plan outlining the location of the turbidity barriers, the method of installation, anchorage details, maintenance and inspection procedures, the removal and storage procedures and contingency plans in case of a breach in the turbidity curtain, 15 days prior to commencement of the Work.

.4 Final report referred to in 1.3.2.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION

3.1 INSTALLATION

.1 Install provisions for turbidity control at the Site during all periods of construction that may impact the quality of water in the Red Deer River including at least the following:

.1 Placement of riprap and bedding material.

.2 Install the temporary turbidity barrier system in accordance with the turbidity control execution plan.

.3 Remove the turbidity barriers during the periods they are not required.

END OF SECTION

1.0 GENERAL

1.1 GENERAL

.1 Fish capture is required prior to start of the Instream Construction Activity and Isolated Construction Activity within the Red Deer River.

.2 Provide the services of a Qualified Aquatic Environmental Specialist (QAES) as defined in the Alberta Environment's Code of Practice for Watercourse Crossings to do the following:

.1 Determine the presence of fish.

.2 Develop a written Fish Capture and Release (FC&R) Management Plan outlining the following:

.1 Site preparations for FC&R.

.2 The locations of fish capture.

.3 The fish isolation methods.

.4 The locations for cofferdams, nets, and other capture structures.

.5 The locations for related equipment and set up.

.6 The water depths required for fish capture including drainage of draw-down methods.

.7 The fish capture, mobilization and release methods.

.8 The fish release location.

.9 The number of working days for fish capture activity.

.10 The pump intake screens in accordance with Regulatory Requirements including the Department of Fisheries and Oceans.

.11 The size and location of the ice-free pool for FC&R operations.

.12 The methods of protection of the fish during all operations of the FC&R.

.3 Obtain the Fish Research License from Alberta Sustainable Resource Development.

.4 Obtain and follow policies with respect to fish capture and release including Alberta Fisheries Management Policy respecting injuries to fish

.5 Supervise the FC&R operation in accordance with the FC&R Management Plan, including on-site supervision for the capture and release activities.

.6 Record fish capture and release activities and results and submit to the Owner.

1.2 REFERENCES

.1 Provide fish capture and release in accordance with the following standards (latest revision) except where specified otherwise.

.2 Water Act [Definition of QAES].

.3 Alberta Fisheries Management Policy [re: injuries to fish].

1.3 SUBMITTALS

.1 Provide the following submittals.

.2 Qualifications of the QAES.

.3 FC&R Management Plan as outlined in clause 1.1.2.2, 7 days prior to commencement of FC&R activities.

.4 Field activity and results records and an additional copy as required by the Fish Research Licence upon completion of the FC&R activities.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION - NOT USED

END OF SECTION

1.0 GENERAL

.1 This section has been revised from the Alberta Transportation Civil Works Master Specifications template.

1.1 DEFINITIONS

.1 "Common Excavation" means the excavation of on-Site soils required by the Contract Documents, excluding Topsoil and Subsoil Stripping, Borrow Area Excavation, and Rock Excavation.

.2 "Topsoil and Subsoil Stripping" means the excavation of Topsoil and Subsoil defined in Section 02234 – Topsoil and Subsoil Stripping.

.3 "Borrow Area Excavation" means the excavation required for the Contractor to provide suitable fill materials as specified in Section 02330 – Earthwork Materials. Supply of suitable fill material and associated borrow area excavation is the sole responsibility of the Contractor.

1.2 SUBMITTALS

Provide the following submittals:

.1 A list of the proposed source(s) where Borrow Area Excavation will be conducted to supply suitable materials, as outlined in Section 02330 – Earthwork Materials, at least 7 days prior to commencing Borrow Area Excavation.

2.0 EXECUTION

2.1 EXCAVATION - GENERAL

.1 Sequence, schedule, and perform excavation and fill placement operations to make the best use of all excavated material, and to minimize the volume of Borrow Area Excavation.

.2 Locate and protect utility lines, survey reference points, instrumentation, and other facilities, unless otherwise specified in Section 02220 – Demolition, Salvage, and Removal.

.3 Remove and dispose of all snow, surface ice, organics, excess water, debris, or deleterious materials prior to starting the excavation.

.4 Excavate to the lines, grades, slopes, and elevations specified in the Contract Documents, unless established otherwise by the Engineer of Record.

.5 The Engineer of Record will determine if unsuitable bearing soils are encountered at the specified subgrade level below the base of the dikes or cut-off trench, which may consist of permeable soils, unsuitable fill soils, or as otherwise identified by the Engineer of Record.

.6 Progress the excavation deeper to remove unsuitable bearing soils and replace excavated soil with Impervious Fill Zone 1A material as directed by the Engineer of Record.

.7 Unauthorized over-excavation beyond the lines, grades, slopes, and elevations specified in the Contract Documents will not be compensated for. Required filling of unauthorized over- excavation will not be compensated for and shall be completed per Section 02331 – Fill Placement.

2.2 PROTECTION

.1 Protect excavations throughout the Work by temporary shoring, bracing, or other suitable methods, if required, to provide safe working conditions and to prevent cave-ins and loose soil from falling into the excavations.

.2 Remove boulders, loose rock, soil blocks, and other fragments that may slide or roll into excavated areas, which, in the opinion of the Owner, Engineer of Record, or Contractor, are unsafe or appear to endanger persons, work, property, or quality of completed work for meeting design requirements. Site safety remains the responsibility of the Contractor.

.3 Protect excavated surfaces against which fill materials will be placed from becoming saturated, freezing, or otherwise becoming unsuitable by sequencing stripping/excavation activities to minimize the amount of exposed areas and the duration the excavation surfaces are exposed prior to receiving fill.

2.3 COMMON EXCAVATION

.1 Provide Common Excavation at the locations, and to the lines, grades, slopes, and elevations specified in the Contract Documents.

.2 Load, haul, and dump all Common Excavation materials at the appropriate fill placement zones, waste disposal areas, or other locations as directed by the Owner or Engineer of Record.

.3 Do not place any Common Excavation materials in waste disposal areas that can be worked to meet the specified requirements for Impervious Fill Zone 1A, unless directed otherwise by the Owner or Engineer of Record.

.4 If necessary, temporarily stockpile materials derived from Common Excavations that are suitable for use in the Impervious Fill Zone 1A. Rehandle, if required, and incorporate these materials in appropriate fill zones prior to obtaining similar materials from the Borrow Area Excavation.

.5 At the end of each workday, the base of the Common Excavation areas are to be prepared to a smooth surface and are to be graded wherever possible to ensure that ponding of water will not occur within the dike footprint. Positive drainage conditions are to be maintained throughout construction. Provide dewatering measures as required and remove accumulated water and softened, unsuitable material from Common Excavation areas.

2.4 TRENCH EXCAVATION

.1 Excavate trenches to the alignments, depths, and slopes indicated in the Contract Documents, or otherwise specified by the Engineer of Record, to a uniform width, sufficiently wide to provide adequate working room for installation and backfill compaction.

.2 Trench excavation material may be stockpiled on a temporary basis a minimum of 1x the depth of trench away from the trench.

.3 Do not complete trench excavation under wet conditions or when precipitation is anticipated to cause adverse conditions.

.4 At the end of each workday, the base of the Trench Excavation areas are to be prepared to a smooth surface and are to be graded to ensure that ponding of water will not occur within the trench. Positive drainage conditions are to be maintained throughout construction. Where maintaining positive drainage within a trenched excavation is not possible, provide dewatering measures, if required, to remove accumulated water from Trench Excavation areas, to ensure work in the dry.

.5 While trench excavations are open (and specifically at the end of each workday), clearly identify and secure the open excavation per Occupational Health and Safety requirements. Site safety and security in the responsibility of the Contractor.

.6 No individual trench excavation shall remain open for more than 7 days. The Engineer of Record may extend this time limit as they see fit based on observed conditions.

.7 Maintain trench excavation side slopes in a safe and neat condition, at all times. The limits of the angle of safe excavation for temporary side slopes are to comply with Occupational Health and Safety requirements. Provide temporary shoring, bracing, or other suitable methods, if required, to provide safe working conditions and to prevent cave-ins and loose soil from falling into the excavations.

2.5 BORROW AREA EXCAVATION

.1 The location(s), excavation layout(s), excavation methods, scheduling, and sequencing of Borrow Area Excavation to provide suitable Impervious Fill Zone 1A materials is the sole responsibility of the Contractor. Impervious Fill Zone 1A is to be pre-qualified as outlined in Section 02330 – Earthwork Materials. The Contractor is responsible to obtain all required permits and approvals to conduct Borrow Area Excavation, as may be required.

2.6 EXCAVATION TOLERANCES

.1 Provide finished excavation surfaces that are smooth, regular, and uniform.

.2 Common Excavation: For finished excavation surfaces, a deviation measured normal to the excavated surface of +/-100 mm will be permitted between the finished excavated surface and the lines, grades, slopes, and elevations specified in the Contract Documents or as established by the Owner and Engineer of Record.

.3 Trench Excavation: For finished excavation surfaces, a deviation measured normal to the excavated surface of 0 mm to -50 mm will be permitted between the finished excavated surface and the lines, grades, slopes, and elevations specified in the Contract Documents or as established by the Owner and Engineer of Record. A consistent grade is to be maintained on the finished excavation surfaces for all trench excavations, to ensure positive drainage and limit ponding.

END OF SECTION

1.0 GENERAL

1.1 GENERAL

.1 This section is a reference section specifying the quality of earthwork materials. Requirements for the inclusion of such materials in the Work are specified elsewhere in the Contract Documents.

1.2 DEFINITIONS

.1 "Effective Particle Size (D_e)" of rock particles is calculated as follows:

$$D_e = \sqrt[3]{\frac{M}{523.6 \times G_s}}$$

Where D_e = Effective particle size measured in metres.

M = Particle mass measured in kilograms.

G_s = Specific gravity of particle = 2.60 unless otherwise measured.

.2 "Percent Passing by Mass" means the cumulative mass of particles that are finer than a specified size expressed as a percentage of the total mass of the sample.

1.3 REFERENCES

.1 Provide earthwork materials in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM D422	Standard Method for Particle Size Analysis of Soils.
.2	ASTM D1140	Standard Test Methods for Amount of Material in Soils Finer than the No. 200 (75µm) Sieve.
.3	ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
.4	ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.3 California Division of Highways

.1	CAL. 206	Method of Test for Specific Gravity and Absorption of Coarse Aggregate.
.2	CAL. 229	Method of Test for Durability Index.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M Sieves, Testing, Woven Wire, Metric.

.5 Prairie Farm Rehabilitation Administration (PFRA)

.1 Unified Soils Classification System as Modified by PFRA.

1.4 SUBMITTALS

.1 Provide the following submittals.

.2 A listing of the proposed source for each type of imported material at least 30 days prior to delivery to the Site.

.3 Samples, of suitable quantities of each type of imported material at the Site requested by the Owner for testing purposes prior to placement.

.4 Results of quality control tests of imported materials taken at the source at least 15 days prior to delivery of such materials to the Site.

.5 Copies of quality control test results of placed materials with 48 hours of sampling.

1.5 QUALITY CONTROL

.1 General

.1 Provide a quality control program to ensure that the specified requirements will be consistently attained throughout the Work. Provide the following quality control testing, and any additional testing or measures as required by the Contractor. The frequency of quality control testing may be increased as deemed necessary by the Owner until the Contractor consistently meets the specified requirements.

Earthwork Material	Tests	Minimum Testing Frequency
Impervious Fill Zone 1A	Atterberg Limits Grain Size Analysis	1 per source and 1 per 1000 m^3 placed or portion thereof
Bedding 5B	Grain Size Analysis Soundness	1 per source and 1 per 1000 m^3 placed or portion thereof
Riprap Class 1	Specific Gravity Absorption Durability Index	1 per source
Riprap Class 2	Specific Gravity Absorption Durability Index	1 per source

Notes:

.1 Perform gradation testing of Riprap as specified in Section 02373 – Riprap and Riprap Bedding Placement.

.2 Engage an independent CSA certified and qualified earthworks materials testing laboratory, with a permit to Practice in the Province of Alberta to sample and test earthwork materials.

.3 Do not import any materials to the Site that may be contaminated with “Prohibited Noxious” or “Noxious” weeds under the Weed Control Act. Engage an independent agrologist to inspect the proposed sources of sand and gravel fill and verify that they are not contaminated.

.2 Sources of Sand, Gravel and Rock Materials

.1 Conduct quality control tests, in addition to those specified in clause 1.5.1, at the source to confirm that it can provide materials that will meet the specified durability requirements prior to commencing processing operations.

.2 During processing of sand and rock materials, test materials from the discharge conveyor belt to verify that the material meets the specified gradation requirements. Notify the Owner at least 48 hours prior to starting production of materials intended for incorporation in the Work.

.3 Promptly notify the Owner if any test fails to meet the specified requirements, and immediately take corrective measures as required to produce materials that are in accordance with the Contract Documents.

.4 Dispose of or, where appropriate, reprocess any material which does not meet the requirements of the Contract Documents.

1.6 QUALITY ASSURANCE

.1 The Owner will perform testing to assure conformance to the specified requirements after the materials have been placed in its final specified location.

.2 The Owner may reject earthwork materials at the source, in the transport vehicle, in the stockpile or in place.

.3 Samples of earthworks materials will be taken by the Owner for quality assurance testing. Testing will be conducted in accordance with the standards listed in clause 1.3 as determined by the Owner. The frequency of quality assurance testing will be as deemed necessary by the Owner. Co-operate with the Owner during sampling and testing. Load and dispose of sampled materials when no longer required by the Owner.

Quality assurance testing of riprap and riprap bedding is specified in Section 02373 – Riprap and Riprap Bedding Placement.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Gradations for earthworks materials except riprap: in accordance with ASTM D422 and ASTM D1140. Specified sieve sizes are based on the nominal sieve opening sizes, in millimetres, under the Canadian Metric Sieve Series in accordance with CAN/CGSB-8.2-M.

.3 Impervious Fill Zone 1A:

.1 Native soils obtained from Contractor supplied borrow areas, that are free from organic materials, deleterious materials, and frozen materials; and

.2 Low to medium plasticity non-dispersive clay till as classified by the Unified Soils Classification system as modified by PFRA with a maximum size of 150 mm, a minimum plasticity index of 7% (as determined by ASTM D4318) and a minimum of 50% passing the 80µm sieve size. Do not use high plasticity clays with a liquid limit greater than 50% as Impervious Fill Zone 1A.

.3 Within 1000 mm of structures and 600 mm of pipes, remove stones larger than 80 mm from the Impervious Fill Zone 1A.

.4 Bedding 5B:

.1 Well graded sand, gravel, and cobbles with a gradation that falls completely within the upper and lower bounds of the envelope defined by straight lines drawn directly between the following points:

Sieve Size	**Percent Passing by Mass**
80 mm	100
50 mm	70% - 100%
20mm	45% - 70%
5 mm	25% - 50%
1.25 mm	10% - 30%
160 µm	0% - 10%
80 µm	0% - 5%

.2 Less than 12% loss of weight after 5 cycles in accordance with the requirements of CAN/CSA-A23.2–9A.

.5 Riprap:

.1 General

.1 Sound, hard, durable particles free from silt, clay, shale, sandstone, flaky particles, topsoil, organic matter, and other deleterious materials.

.2 Meet the following minimum requirements for soundness and durability.

Method of test	**Requirements**
California Division of Highways, CAL. 206	Minimum Specific Gravity: = 2.60 Maximum Absorption: = 2%
California Division of Highways, CAL 229	Minimum Durability Index: = 52 Durability Index may be less than 52 if DAR* > 23

*Durability Absorption Ratio (DAR) = $\frac{\text{Durability Index}}{\text{Absorption \% + 1\%}}$

.3 Ratio of maximum dimension to minimum dimension of individual pieces not to exceed 3.0.

.2 Riprap Class 1:

.1 With the following gradation:

Effective Particle Size	Percent Passing by Mass
450 mm	0% greater than
350 mm	20% – 50%
300 mm	50% – 80%
200 mm	100% greater than

.3 Riprap Class 2:

.1 With the following gradation:

Effective Particle Size	Percent Passing by Mass
800 mm	0% greater than
600 mm	20% – 50%
500 mm	50% – 80%
300 mm	100% greater than

3.0 EXECUTION

3.1 STOCKPILING OF SAND, GRAVEL, AND ROCK MATERIALS AT THE SOURCE

.1 Temporarily stockpile all sand, gravel, and rock materials that have been processed by washing methods for a minimum of 48 hours to permit drainage of excess water. Do not place recently washed materials on top of or with drier stockpiled materials.

.2 Use equipment and handling, stockpiling, and loading methods that minimizes the amount of material handling, and that do not cause segregation or material breakdown.

.3 Do not stockpile materials where contamination with the underlying soils can occur.

.4 Do not construct stockpiles by cone piling.

.5 For gravel materials, construct temporary stockpiles by first distributing material over the entire base and then by building upwards in successive layers which do not exceed a thickness of 2 m per layer. Construct each layer working from the outer edges toward the centre of the stockpile. Complete each layer over the entire area before starting the subsequent layer. Keep traffic on the materials to a minimum during stockpiling. Do not push or dump gravel material over the edges or down the faces of the stockpile.

.6 Keep stockpiles neat and regular in form.

.7 Do not construct stockpiles that are more than 6 m in height.

.8 Maintain a minimum clearance of 5 m between stockpiles of each material.

.9 Replace stockpiled material that becomes contaminated, damaged, or lost.

3.2 PLACEMENT

.1 Refer to other sections for subgrade preparation and placement of earthwork materials.

END OF SECTION

1.0 GENERAL

1.1 GENERAL

.1 This section specifies placement requirements for fill materials specified in Section 02330 – Earthwork Materials, except for Riprap and Bedding.

1.2 REFERENCES

.1 Provide fill placement in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN m/m^3) (Standard Proctor).
.2	ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
.3	ASTM D4253	Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.
.4	ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 DEFINITIONS

.1 “Authorized Fill Placement” means the placement of fill materials, as requested by the Owner, to replace Authorized Structure Over-Excavation.

1.4 SUBMITTALS

Provide the following submittals:

.1 Specifications for the proposed compaction equipment prior to commencing fill placement.

.2 Copies of quality control test results of compacted materials within 48 hours of sampling.

1.5 QUALITY CONTROL

.1 Perform quality control tests of fill materials as specified in Section 02330 – Earthwork Materials.

.2 Provide a quality control program to ensure that the specified requirements will be consistently attained throughout the Work. Provide the following quality control testing at the Site, and any additional testing or measures as required by the Contractor, Owner, and/or Engineer of Record during the Work. The frequency of quality control testing may be increased as deemed necessary by the Owner and/or Engineer of Record until the Contractor consistently meets the specified requirements and/or based on variability if material throughout fill placement.

.1 Moisture-Density Relation Testing using Standard Effort (Standard Proctor) Tests:

Frequency: Minimum of 1 test for each type of material or borrow source, and additional tests based on material and volume as follows:

Impervious Fill Zone 1A: As required based on material variability or as required by the Owner. Contractor should account for a minimum of 1 on-site test per 10,000 m^3 placed.

.2 Field Density and Moisture Content Tests – Fill Placement in Embankments:

Impervious Fill Zone 1A: Minimum of 2 tests for compacted material placed during 1 shift.

.3 Conduct testing in accordance with the ASTM Standards listed in clause 1.2.2 as determined by the Owner.

.4 Engage an independent CSA certified and qualified earthworks materials testing laboratory, with a permit to Practice in the Province of Alberta to sample and test fill materials.

1.6 QUALITY ASSURANCE

.1 The Owner may test fill materials at any time to assure suitability for the intended uses.

.2 The Owner will perform any testing of fill material to assure conformance with the specified requirements, at the Site, prior to, during, and after the material has been placed and compacted.

.3 Density and moisture content tests will be performed by the Owner during fill placement. Testing will be conducted in accordance with the ASTM Standards listed in clause 1.2.2 as determined by the Owner and Engineer of Record. Co-operate with the Owner during sampling and testing. The frequency of density and moisture content testing will be determined by the Owner, the Owner's selected testing agency, and the Engineer of Record.

.4 The Owner or Engineer of Record may reject fill material during excavation, in the borrow areas, in the stockpiles, in the transport vehicle, or in place. Rejected material shall be disposed by the contractor at their own expense.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Fill Material: Includes Impervious Fill 1A. Refer to Section 02330 – Earthwork Materials for material specifications.

3.0 EXECUTION

3.1 PREPARATION

.1 Perform stripping as specified in Section 02234 – Topsoil and Subsoil Stripping.

.2 Remove debris, snow, ice, organics, water, and loose material prior to starting fill placement. Do not place fill material when the material, the foundation, or the surface on which it would be placed is frozen or saturated by precipitation, runoff, or ponding due to poor drainage

.3 Moisten if required and scarify the foundation surface to a minimum depth of 150 mm to obtain a good bond prior to placing the first lift of fill.

.4 Grade and recompact the scarified foundation surface to the same density specified for the overlying fill.

.5 Where soft subgrade areas are encountered, they are to be sub-cut to remove soft materials and backfilled with suitable Impervious Fill Zone 1A material per the direction of the Engineer of Record and in accordance with Fill Placement specifications outlined in clause 3.3.

.6 Do not place fill material on any surface until the prepared surface has been inspected by the Engineer of Record. Rectify any defects, including any identified by the Engineer of Record. The Engineer or Record shall be onsite to witness the scarification, moisture conditioning, and re-compaction of existing subgrade.

.7 When required by the Engineer of Record, the Contractor shall supply and operate a loaded test vehicle of 8200 kg axle load to proof roll the prepared existing subgrade. Where proof rolling indicates areas that are defective, the Contractor shall remove and replace the material with suitable compacted material.

3.2 PROTECTION

.1 Suspend fill placement operations at any time when, in the opinion of the Owner, work cannot be performed in accordance with the specifications on account of rain, flooding, cold weather, or other unsatisfactory conditions.

.2 Immediately prior to any suspension in fill operations, slope the fill surface as specified and roll with rubber tire equipment or smooth cylindrical roller to leave the surface area in a smooth, even condition for drainage without ponding.

.3 Protect compacted fill and foundation surfaces that have been prepared for receiving fill from freezing by a using a temporary layer of soil or insulating materials, or other means authorized by the Owner. Remove protection only when ready to place fill, and authorization is provided by the Owner.If deemed necessary by the Owner, condition, rework, and re-compact or remove and replace any portion of the fill or foundation that has suffered a reduction in quality due to drying, frost, rain, or any other reason to the specified requirements before placing succeeding layers.

.4 Reroute construction traffic away from or stabilize areas to the satisfaction of the Owner where the fill or ground surfaces begin to rut or exhibit instability.

.5 Where the fill or ground surfaces begins to rut or exhibit instability, reroute construction traffic away from this area to the satisfaction of the Engineer of Record. Either strip the area of disturbed, rutted soils, and replace the stripped material with suitable fill, or scarify, dry, and recompact the area of instability to achieve the required compaction.

3.3 FILL PLACEMENT

.1 Do not place fill material on any surface until the prepared surface has been inspected by the Owner. Rectify any defects, including any identified by the Owner.

.2 Construct fill zones at the locations, and to the lines, grades, slopes, and elevations specified in the Contract Documents, or as established by the Owner, using fill materials that are placed, conditioned, and compacted to the specified requirements.

.3 Overbuild final fill slopes and then trim them to the lines, grades, slopes, and elevations specified in the Contract Documents.

.4 Maintain the top surface of fill zones approximately horizontal. During spreading and compaction, provide the surface of the fill zone with a gentle transverse gradient of 3% to 5% so that water from precipitation will drain freely toward the extremities of the fill zone but away from any filter materials.

.5 Place and spread fill materials in continuous and approximately horizontal layers of uniform thickness in such a manner as to prevent segregation and stratification and to obtain a homogeneous mass.

.6 Place, spread and compact fill materials in a continuous operation to avoid freezing of the materials before the specified compaction can be achieved.

.7 Place and spread Impervious Fill Zone 1A in a direction parallel to the berm centreline to minimize the potential for formation of preferential seepage paths.

.8 If required, use discs prior or during fill placement operations to mix or blend as required to obtain a consistent fill material, and to scarify, blend, and break up Impervious Fill Zone 1A materials to the full depth of the uncompacted lift. Use a heavy disc offset plough with 900 mm diameter discs with the offset or opening of the plough operated by hydraulic cylinder controlled by the operator. Replace discs that are worn by more than 25% of the depth of the serrations or notches when new.

.9 Commence placement of fill materials at the lowest elevation of the foundation, and progress in an upslope direction.

.10 Moisten each previously placed lift, if necessary, and work with discs to a minimum depth of 50 mm to provide a bonding surface prior to placing the overlying lift of fill material except when, in the opinion of the Owner, such work cannot be performed because of cold weather.

.11 Place fill materials in layers not exceeding the loose thickness specified in clause 3.6.

.12 Join new fill onto all natural, excavated, or fill slopes by terracing or stepping into the slopes. Stagger fill joints to minimize the potential for preferred seepage paths in any direction.

.13 Do not place fill material adjacent to cast-in-place concrete structures until at least 14 days after concrete placement or until 75% of the specified compressive concrete strength has been achieved.

.14 Place fill material equally on all sides of structures and pipes to minimize unbalanced loading.

.15 Do not operate compaction equipment over structures or pipes until a sufficient depth of cover has been achieved that will protect the pipe from excessive load.

.16 Apply compaction effort for a minimum horizontal distance of 600 mm on each side of joints in the fill zones.

.17 During placement and compaction operations, direct the movement of equipment to obtain uniform coverage. Disc and re-compact areas of non-uniformly compacted ridges or troughs resulting from placement or spreading equipment.

.18 Unless otherwise authorized by the Owner, maintain no more than 1000 mm maximum difference in elevation between adjacent fill zones, and maintain the temporary slopes within fill zones no steeper than 5H:1V.

.19 Place, condition, and compact Authorized Fill Placement materials to the specified requirements for the fill material used. Authorized Fill Placement will be considered as Extra Work.

3.4 MOISTURE CONTROL

.1 Compact each layer of fill material within the moisture content limits specified in clause 3.6.

.2 Add water to the fill material when its moisture content is below that specified. Use methods that permit water to be added in controlled amounts and which do not cause finer materials to be washed out. Work the water into the fill material until the specified moisture content is uniformly obtained throughout the material.

.3 When the moisture content of the fill material exceeds the specified limits, dry the fill material prior to compaction by spreading, discing, and harrowing the fill material until the specified moisture content is uniformly obtained throughout the material.

.4 Add sufficient quantities of water to sand and gravel fill materials during compaction, even when moisture content limits have not been specified, to achieve the required densities.

.5 Do not add water to the fill material or perform drying operations such as spreading, discing, and harrowing when, in the opinion of the Owner, such work cannot be performed because of cold weather.

.6 Mixing of suitable materials having different in situ moisture contents to obtain the required moisture content is permitted. Use discs or other methods to obtain a consistent material with the required uniformity of moisture content.

3.5 COMPACTION EQUIPMENT

.1 Use compaction equipment of the type, size, and efficiency capable of achieving the densities specified in clause 3.6.

.2 Unless otherwise authorized by the Owner, use the following types of equipment to compact the corresponding fill materials:

.1 Sheepsfoot roller for Impervious Fill Zone 1A. Use a sheepsfoot roller consisting of two or more non-vibratory drums with each drum at least 1500 mm in diameter and having a fully ballasted operating mass of at least 6000 kg/m of drum length. Provide individual roller drums between 1500 mm and 2000 mm in length, with the space between drums not exceeding 400 mm. Provide roller feet that are between 230 mm and 280 mm long with a minimum centre-to-centre spacing of 230 mm, and spread uniformly over the surface of the drum with at least 1 foot for each 60000 mm^2 (0.06 m^2) of roller surface. The end area of each foot is not to exceed 6400 mm^2. Tow the roller at a speed not exceeding 5 km/h, using equipment that does not leave compacted surfaces that prevent uniform penetration by the roller feet.

.2 Vibratory padfoot roller for Impervious Fill Zone 1A with a minimum operating mass of 10000 kg and capable of exerting a minimum vibratory centrifugal force of 230 kN. Use a vibratory padfoot roller in areas that are inaccessible to the sheepfoot roller.

.3 In areas that are not accessible to the specified compaction equipment or which are within 1000 mm of structures and 600 mm of pipes, or other items susceptible to compaction induced damage, reduce the lift thickness, remove stones larger than 80 mm, and compact fill materials with hand operated pneumatic or mechanical tamping equipment.

.4 Where fill soils are being placed within 2 m of structures (specifically existing building foundations), use only static compaction methods when utilizing ride on equipment or use hand operated pneumatic or mechanical tamping equipment at these locations.

3.6 COMPACTION SCHEDULE

.1 Lift thickness, moisture content limits, and compaction requirements and densities to conform to the following:

Fill Material	Maximum Loose Lift Thickness(1) (mm)	Moisture Content Limits(2)	Minimum Number of Passes(3)	Density Limits(4)
Existing Subgrade/Fill	N/A	–2% to +2%	6	N/A
Impervious Fill Zone 1A	200	–2% to +1%	6	≥97% SPMDD

.1 For areas specified in clause 3.5.3, reduce loose lift thickness to 100 mm and compact each lift using pneumatic or mechanical hand tamping equipment.

.2 Moisture content range above (+) or below (–) Optimum Moisture Content (ASTM D698). Moisture content as determined by ASTM D2216.

.3 A single pass means the complete coverage of the fill lift, overlap required for complete coverage will not be considered to provide any portion of a subsequent or previous pass. Achieve both specified density and the specified minimum number of passes with compaction equipment.

.4 Standard Proctor Maximum Dry Density (SPMDD) as determined by ASTM D698.

3.7 PLACEMENT TOLERANCES

.1 Provide finished fill surfaces that are smooth, regular, and uniform.

.2 For Impervious Fill Zone 1A, a deviation, measured normal to the finished surface, of +50 mm will be permitted between the finished surfaces and the lines, grades, slopes, and elevations specified in the Contract Documents, excluding the top of the dike. For the top of dike, a deviation measured normal to the finished surface, of 0 mm to +25 mm will be permitted between the finished surface and the lines, grades, slopes, and elevations specified in the Contract Documents or as established by the Engineer of Record.

.3 Limit the maximum rate of change in deviation from the specified grade of any surface to a ratio of height to length of 1:50. The height and length of the gradual irregularity will be measured normal and parallel, respectively, to the specified grade.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

Provide geotextile in accordance with the following standards except where specified otherwise:

.1 American Society for Testing and Materials (ASTM)

.1	ASTM D3786	Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
.2	ASTM D4491	Standard Test Method for Water Permeability of Geotextiles by Permittivity.
.3	ASTM D4533	Standard Test Method for Trapezoidal Tearing Strength of Geotextiles.
.4	ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
.5	ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile.
.6	ASTM D4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

1.2 SUBMITTALS

Provide the following submittals:

.1 The manufacturer's product technical specification certifying that the geotextile being supplied meets the specified requirements prior to delivery to the Site.

1.3 DELIVERY, STORAGE, AND HANDLINGS

.1 Inspect each shipment of material and timely replace any damaged materials.

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

2.0 PRODUCTS

2.1 MATERIALS

Provide materials in accordance with the following:

.1 Geotextile: Non-woven, needle punched, composed of a minimum 85% polypropylene or polyester polymers, formulated to resist deterioration by ultraviolet exposure and free of manufacturing defects, cuts, tears, or any other physical damage, that meets or exceeds the following physical properties:

Property	Requirement	Test Method
1. Puncture	900 N	ASTM D4833
2. Grab Strength	1200N	ASTM D4632
3. Grab Tensile Elongation	50%	ASTM D4632
4. Trapezoidal Tear Strength	575 N	ASTM D4533
5. Mullen Burst Strength	4500 kPa	ASTM D3786
6. Apparent Opening Size	150 to 225 □m	ASTM D4751
7. Permittivity	0.7 to 0.9 sec^{-1}	ASTM D4491
8. Flow Rate	34 to 44 $L/s/m^2$	ASTM D4491

2.2 SHOP FABRICATION

.1 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.

3.0 EXECUTION

3.1 PREPARATION

.1 Excavate and prepare the subgrade to the lines, grades, slopes, and elevations specified in the Contract Documents. Remove rock fragments or other objects having sharp projections.

.2 Remove snow, ice, organics, loose, or other deleterious materials from the subgrade.

.3 Do not place geotextile until the prepared subgrade surfaces have been inspected by the Owner or Engineer of Record. Rectify any defects as required by the Owner or Engineerof Record.

3.2 INSTALLATION

.1 Install geotextile at the locations, to the lines, grades, slopes, and elevations specified in the Contract Documents.

.2 Place geotextile in a smooth, wrinkle-free, and slack condition to conform to the contour of the subgrade without becoming taut when covered with the specified material. Where required to conform to the subgrade, provide folds in the geotextile. Orient folds in the downslope and downstream direction.

.3 Place the geotextile with the longitudinal seam parallel to the longitudinal direction.

.4 At field seams, including patches or repair areas, provide a minimum overlap of 500 mm or as required by the manufacturer, whichever is greater.

.5 Temporarily anchor the geotextile with sandbags or weights placed at the outer edges, along seams, and at other intermediate points as required to prevent displacement.

.6 When placing geotextile in the wet, anchor the geotextile with stakes placed at the outer edges along seams to prevent displacement.

.7 Construct field seams such that the upper upslope sheet of the geotextile overlaps the downslope sheet, and the downstream end of the sheet overlays the upstream end of the adjacent sheet.

.8 Trim excess geotextile at the outer edges to the specified lines.

.9 Protect the geotextile from damage. Repair or replace geotextile damaged during installation or construction of subsequent Work.

.10 Do not allow any equipment to operate directly on the geotextile or the overlying material.

.11 Cover the geotextile within 2 days of installation with the specified material. During placement of the specified material, limit the height from which the material is placed to 300 mm or lower, as required to avoid damaging or displacing the geotextile.

END OF SECTION

1.0 GENERAL

1.1 QUALITY CONTROL

.1 Perform quality control tests for riprap and riprap bedding specified in Section 02330 – Earthwork Materials.

.2 Transport only suitable materials meeting the specifications to the Site.

1.2 QUALITY ASSURANCE

.1 The Owner may perform testing to assure conformance to the specified requirements after the materials have been placed.

.2 The Owner may reject riprap and riprap bedding at the source, in the transport vehicle, in the stockpile, or in place.

.3 During the course of the Work, and prior to acceptance, provide assistance to the Owner in conducting the following quality assurance testing:

.1 Load a 7 m^3 sample of each class of riprap, selected by the Owner, and transport to the on-Site test location as designated by the Owner or Engineer of Record. Weigh selected boulders from the sample to establish reference sizes for sorting. Sort all of the boulders in the sample into similar weight groups, and spread each weight group in a single row.

.2 The Owner will count the number of boulders in each weight group, compute the effective particle size (D_e) and weight for each group, and determine the gradation for the sample.

.3 Provide a weigh scale capable of weighing each boulder individually. Calibrate the weigh scale at the start of the riprap placement operations, or as required by the Owner.

.4 Provide all necessary labour and equipment to load, weigh, sort and spread the riprap samples.

.5 If the tested riprap sample meets the specifications, incorporate the riprap in the Work at a location designated by the Owner for reference purposes.

.6 A minimum of 1 gradation test may be conducted for each class of riprap, and for every individual source for each class of riprap.The frequency of riprap testing may be increased as deemed necessary by the Owner until the Contractor consistently meets the specified requirements.

.4 The Owner may take samples of riprap bedding for quality assurance testing. Co-operate with the Owner during testing.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Riprap: Refer to Section 02330 – Earthwork Materials for material specifications.

.3 Riprap Bedding Zone 5B: Refer to Section 02330 – Earthwork Materials for material specifications.

3.0 EXECUTION

3.1 STOCKPILES

.1 Obtain prior authorization from the Owner for temporary stockpile locations on-Site. Do not stockpile riprap or riprap bedding in areas where contamination with the underlying soils can occur. Prepare stockpile areas by grading the area level and diverting drainage from adjacent areas away from the stockpile locations.

.2 Stockpile riprap and riprap bedding in a manner that minimizes segregation.

3.2 PLACEMENT

.1 Place riprap and riprap bedding at the locations, and to the lines, grades, slopes, and elevations specified in the Contract Documents.

.2 Prior to placing riprap and riprap bedding and unless specified otherwise, install geotextile on the receiving surfaces as specified in Section 02342 – Geotextile.

.3 Surfaces to receive riprap and riprap bedding may be frozen, but remove water, snow, ice, frozen lumps, and other deleterious materials from receiving surfaces.

.4 Do not place riprap and riprap bedding until the receiving surfaces have been inspected by the Owner. Rectify defects, including any identified by the Owner, until the receiving surfaces meet the requirements of the Contract Documents.

.5 Riprap material must be clean of soils prior to placement.

.6 Place riprap and riprap bedding by clam shell, dragline, backhoe, or similar lifting equipment. Do not end-dump and push riprap and riprap bedding into place on the slopes.

.7 Do not cause segregation, particle damage, breakdown, or excessive displacement of the previously placed riprap and riprap bedding. Replace or repair damaged or displaced material.

.8 Obtain the specified distribution of the various sizes of particles throughout the mass by using selective loading at the source or stockpile, by controlled dumping of successive loads during placing, or by other methods of placement.

.9 Commence placement of riprap and riprap bedding from the toe of the slope and proceed up the slope.

.10 Place riprap and riprap bedding to its full thickness in one operation. Compaction is not required.

.11 Place riprap in a closely packed arrangement such that smaller rocks fill the voids between larger rocks and there are no unfilled spaces that would permit the escape of underlying layers of placed materials. Interlock particles and dress slopes as required.

.12 Rearrange rocks to eliminate any tendency of the rocks to move or slide after placement.

.13 Do not break individual riprap particles after placement.

.14 Do not allow equipment to travel upon riprap and riprap bedding.

.15 Provide a completed riprap surface that is smooth, regular, and uniform.

.16 When placing riprap and riprap bedding adjacent to the Red Deer River (including keying in the toe of the riprap) adhere to the specifications outlined in Section 02240 – Care of Water and Section 02242 – Instream Activity

3.3 PLACEMENT TOLERANCES

.1 Place riprap within a tolerance of +100 mm of the specified thickness and within a tolerance of +100 mm of the specified elevation.

.2 Place riprap bedding to within a tolerance of +50 mm of the specified thickness and within a tolerance of +100 mm of the specified elevation.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide precast concrete manholes in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM C478M	Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric).
.2	ASTM A48	Standard Specification for Gray Iron Castings.

.3 Canadian Standards Association (CSA)

.1	CAN/CSA-A3000	Cementitious Materials Compendium.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings of precast concrete manhole components, including access hatches, frames and covers at least 20 days prior to fabrication. Indicate on the shop drawings material specifications, dimensions and elevations, and pipe openings.

.3 Certified copies of results of tests specified in ASTM C478M prior to delivering any precast concrete manhole components to the Site.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged material.

.2 Unload, handle, and store materials in accordance with the manufacturer's written instructions.

.3 Store sealant in a warm and dark location until immediately before use.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Manholes:

.1 Precast reinforced concrete manhole sections, monolithic bases, and top slabs in accordance with ASTM C478M with matching female and male joints between precast concrete manhole components.

.2 Safety lift rings in precast manhole sections and monolithic bases.

.3 Concrete for manholes: Minimum compressive strength of 30 MPa at 28 days using Type 50 Sulphate Resistant Portland Cement in accordance with CAN/CSA-A3000, with an air content between 5% and 8%.

.3 Butyl rubber sealant for joining manhole components: Conseal CS 302 as manufactured by Concrete Sealants Inc. or Kent Seal No. 2 as manufactured by Hamilton Kent.

.4 Rungs: Aluminum, Model 350 climbing rungs complete with Model 3102 safety T-handle handles as manufactured by MSU Mississauga.

.5 Hatches: Aluminum, lockable, 750 * 750 Type M access hatches as manufactured MSU Mississauga. Sizes as specified in the Contract Documents.

.6 Frames and Covers: Cast iron in accordance with ASTM A48, Class 30B.

.7 Flexible connectors: Kor–N–Seal pipe to manhole connectors as manufactured by Trelleborg Sealing Profiles.

.8 Cement grout: To consist of 1 part Type 50 Sulphate Resistant Portland Cement to 2 parts sand with sufficient water to produce a stiff paste.

2.2 SHOP FABRICATION

.1 Form or core openings in the manhole sections to accommodate pipe penetrations and flexible connectors. Keep the diameter of each opening to the minimum required to accommodate the pipe penetration or flexible connector. Exercise care during the coring operation to prevent damage to the manhole section.

3.0 EXECUTION

3.1 EXCAVATION AND PREPARATION OF THE FOUNDATION

.1 Excavate the manhole foundation to the specified elevations as specified in the Contract Documents.

.2 Provide care of water to permit the work to be carried out in the dry.

.3 The Owner will identify unsuitable bearing soils when encountered at the earth foundation level. Perform excavation, as classified by the Owner, to remove unsuitable bearing soils and replace with fill materials as directed by the Owner.

.4 Compact the base of the excavation to provide a firm foundation of uniform density beneath the manhole.

3.2 INSTALLATION

.1 Install precast concrete manholes at the locations, of the sizes, and to the lines, grades, slopes, and elevations specified in the Contract Documents. The tolerance from specified lines, grades, slopes, and elevations is +/-15 mm, and the maximum variation from plumb is 1H:300V.

.2 Install the sealant between manhole components in strict accordance with the manufacturer's written instructions to provide a watertight joint.

.3 Install the flexible connectors in strict accordance with the manufacturer's written instructions to provide a watertight joint.

.4 Completely fill the gaps between the manhole sections and pipes with cement grout to provide a watertight joint. Continuously moist cure and protect the grout for a minimum of 7 consecutive days at a minimum temperature of 10°C.

.5 Do not commence backfilling operations until the Owner has inspected the manhole installation. Rectify defects, including any identified by the Owner.

.6 Provide the specified backfill evenly around manholes to avoid displacing the manhole components.

.7 Within 1000 mm of the manhole, remove stones larger than 80 mm in diameter from the fill material. Place fill in lifts not exceeding 100 mm in thickness. Compact each lift using pneumatic or mechanical hand tamping equipment.

.8 Compact each lift of fill at the moisture content and to the density specified in Section 02331 – Fill Placement.

.9 Prevent displacement of the manholes through floatation.

.10 Maintain the interior of the manholes free of foreign material.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide slotted PVC pipes in accordance with the City of Calgary Standard Specifications and the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM D3034	Standard Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.
.2	ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

.3 Canadian Standards Association (CSA)

.1	B1800 SERIES	Plastic Nonpressure Pipe Compendium.

1.2 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and replace any damaged material in a timely manner.

.2 Unload and handle pipe by hand or using canvas slings to avoid scratching the pipe. Do not use individual chains or single cables.

.3 When handling pipe avoid impact blows, abrasion damage, and gouging or cutting by abrasive surfaces or sharp objects. Replace pipe with deep scratches as required by the Design Professional.

.4 Do not stack pipe higher than 1.5 m, and provide support for the barrel to prevent bending of the pipe. Do not expose stockpiled pipe to direct sunlight. Provide for air circulation through the stockpiled pipe.

.5 Store rubber gaskets in a warm, dark location until immediately prior to use.

1.3 SUBMITTALS

.1 Provide the following submittals.

.2 Product data at least 15 days prior to delivering any materials to the Site.

.3 Copy of manufacturers' written installation instructions at least 10 days prior to the start of installation.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 PVC pipe:

.1 Rigid PVC pipe including fittings in accordance with B1800 Series and ASTM D3034, with a dimension ratio (DR) of 35 and a minimum pipe stiffness of 320 KPa.

.2 Bell and spigot type joints complete with rubber gaskets in accordance with B1800 Series and ASTM F477.

.3 Cylindrical and straight PVC pipe with ends cut square to the longitudinal axis, and with pipe walls that have a smooth finish free from imperfections such as grooves or ripples. Bevel the pipe ends as required for joining.

3.0 EXECUTION

3.1 INSTALLATION

.1 Do not install the pipe when the ambient temperature is below –5°C or above 32°C. Shield the ends to be joined from direct sunlight prior to and during the laying operation.

.2 Inspect the gasket, gasket groove, and sealing surfaces for any damage or deformation. Both the bell and spigot ends must be free of irregularities. Strictly adhere to the manufacturer's written instructions for cleaning, setting the gasket, lubricating the ends of the pipes, and jointing.

.3 Install pipes with joints close and even abutting all around, and without any deflections at the joints unless specified otherwise.

.4 Install the pipe at the locations, of the sizes, and to the lines, grades, and elevations specified in the Contract Documents. The tolerance from the specified lines, grades, and elevations is +/-15 mm. Where departures occur that are within the specified tolerance, return to the specified lines, grades, and elevations gradually at a rate of not more than 5 mm per metre length of pipe. For greater departures, remove and reinstall pipe.

.5 Provide watertight pipe joints, and install the pipes so that they free of depressions and are free draining.

.6 When a laser beam is used to maintain grade, use manual survey methods to check the pipe invert at several intermediate locations and at the termination points.

.7 Install perforated pipes such that 1 row of perforations is along the top of the pipe.

3.2 FILL AND BACKFILL

.1 Place fill materials in accordance with Section 02331 – Fill Placement.

.2 Do not commence fill placement operations until the installed pipes have been inspected by the Design Professional. Rectify defects, including any identified by the Design Professional.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide precast concrete pipe in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM C76M — Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric).

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-A3000 — Cementitious Materials Compendium.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings showing dimensions and details of the pipe joint including the allowable installation tolerances for the joint gap between adjacent pipe units at least 20 days prior to manufacture.

.3 Certified copies of the results of the tests specified in clause 1.3 prior to delivering any pipe to the Site.

.4 Manufacturer's written instructions for unloading, handling, and storing materials prior to unloading.

1.3 QUALITY CONTROL

.1 During manufacture, perform the following tests in accordance with ASTM C76M for each diameter and class of pipe:

.1 Concrete compressive strength tests.

.2 Rubber gasket compound tests.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged material.

.2 Unload, handle, and store pipe units in accordance with the manufacturer's recommendations, and in a manner that prevents damage. Replace damaged units.

.3 Store rubber gaskets in a warm and dark location until immediately prior to use.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Precast concrete pipe:

.1 In accordance with ASTM C76M, Strength Class IV as outlined in Table 4 of ASTM C76M.

.2 Designed to resist the governing combination of loads and pressures, installation, and bedding conditions as specified below:

.1 Earth load based on the depth of cover and installation condition shown in the Contract Documents. Use a saturated unit weight of 21 kN/m^3 for the backfill.

.2 Live load due to compaction equipment that will be used for backfilling.

.3 Excavation, backfill, and bedding conditions as specified in the Contract Documents.

.3 Concrete: Minimum compressive strength of 27.6 MPa at 28 days in accordance with ASTM C76M with Type HS or HSb Sulphate Resistant Cement in accordance with CAN/CSA-A3000.

.4 Joints: Flexible, watertight, bell and spigot pipe joints complete with confined O–ring rubber gaskets in accordance with ASTM C76M. At the joints, provide formed concrete surfaces, upon which the gasket will be in contact, that are free of airholes, chipped or spalled concrete, laitance, or other defects.

.5 Gasket lubricants: As recommended by the manufacturer.

.6 Clearly mark the pipe class, size, date of manufacture, and location of the minor axis of elliptical reinforcement, if provided, on each pipe.

.7 Flared End Bar Screens: Sized to suit standard flared inlet as recommended by the precast concrete pipe manufacturer.

3.0 EXECUTION

3.1 EXCAVATION AND PREPARATION OF THE FOUNDATION

.1 Excavate the pipe foundation to the lines, grades, slopes, and elevations specified in the Contract Documents, and to a sufficient width to permit assembly of the pipe and the operation of compaction equipment adjacent to the pipe.

.2 Provide care of water to permit the work to be carried out in the dry.

.3 The Owner will identify unsuitable bearing soils when encountered at the earth foundation level. Perform excavation to remove unsuitable bearing soils and replace with fill materials as directed by the Owner.

.4 Compact the base of the excavation to provide a firm foundation of uniform density beneath the entire length of the pipe.

.5 Construct the pipe bedding as specified in the Contract Documents. Shape the bedding to conform to the bell joint for uniform support.

3.2 INSTALLATION

.1 Install the pipe with the bell end of the pipe located upstream.

.2 Inspect the sealing surfaces at the bell and spigot ends and the gasket for any damage or defects.

.3 Install and join pipe units in strict accordance with the manufacturer's written instructions. Provide a uniform gap all around the pipe joint, and without any deflections at the joints unless specified otherwise. Maintain the gap within the manufacturer's specified tolerances.

.4 Clean and lubricate the bell and spigot ends. Lubricate and fit the gasket properly so that it is uniformly stretched around the pipe. Do not twist, displace, or damage the gasket.

.5 Install the pipe at the locations, of the sizes, and to the lines, grades, slopes, and elevations specified in the Contract Documents.

.6 Provide a completed installation that is watertight, free of depressions, and drains freely.

.7 When a laser beam is used to maintain grade, use manual survey methods to check the pipe invert at several intermediate locations and at the termination points.

.8 Remove lifting hooks or pins from pipes as required by the Owner. Grout pockets at lifting points when no longer required. Use cement grout consisting of 1 part Type HS or HSb Sulphate Resistant Cement to 2 parts sand with sufficient water to produce a stiff paste.

3.3 FILL AND BACKFILL

.1 Do not commence fill placement operations until the installed pipes have been inspected by the Owner. Rectify defects, including any identified by the Owner.

.2 Provide fill as specified in the Contract Documents, so that direct and continuous contact between the pipe wall and the fill material is attained.

.3 Within 600 mm of the pipe, remove stones larger than 80 mm from the fill material. Place fill in lifts not exceeding 100 mm in thickness, and compact using pneumatic or other mechanical hand tamping equipment.

.4 Compact each lift of fill at the moisture content and to the density specified in Section 02331 – Fill Placement.

.5 Prevent damage to the pipe during fill placement. Do not permit compaction equipment to come into direct contact with the pipe.

.6 Bring fill up simultaneously and evenly on both sides of the pipe and in firm contact with the haunches of the pipe. Do not allow construction equipment to pass over the pipe until a minimum cover of 600 mm, or greater if necessary to prevent damage to the pipe, of compacted fill has been placed.

.7 Prevent displacement of the pipe during fill placement operations or through floatation.

.8 Maintain the interior of the pipes free of foreign material.

3.4 INSTALLATION TOLERANCES

.1 The installation tolerance from the specified lines, grades, slopes, and elevations is ±15 mm. Where departures occur that are within the specified tolerance, return to the specified lines, grades, slopes, and elevations gradually a rate of not more than 5 mm per metre length of pipe. For greater departures, remove and reinstall pipe.

END OF SECTION

1.0 GENERAL

1.1 EXTENT OF TOPSOIL AND SUBSOIL PLACEMENT

.1 Topsoil placement is required on exposed finished excavation surfaces, finished fill surfaces, ground areas affected by the Work, and other areas as specified in the Contract Documents or as designated by the Owner or Engineer of Record.

.2 Subsoil placement as required on prepared surfaces as specified in the Contract Documents or as directed by the Owner or Engineer of Record. Subsoils from the project location may in areas outside of the dike footprint and where grade supported structures are not proposed to be installed.

.3 The Owner or Engineer of Record may adjust the placement thickness of Topsoil and/or Subsoil to best utilize the available materials.

1.2 REFERENCES

Provide Topsoil and Subsoil placement in accordance with the following standards (latest revision) except where specified otherwise.

.1 Soil Quality Criteria Working Group, Soil Reclamation Subcommittee, Alberta Soils Advisory Committee, Alberta Agriculture, March 1987 – Reprinted November 1993, Conservation and Development Branch, Alberta Agriculture

.1 Soil Quality Criteria Relative to Disturbance and Reclamation

.2 American Society for Testing and Materials (ASTM)

.1 ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12400 ft- lbf/ft3 (600 kN-m/m^3))

.3 Alberta Transportation

.1 Field Guide for Erosion and Sediment Control available at: www.transportation.alberta.ca

.2 Post-Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Road Construction.

1.3 SUBMITTALS

Provide the following submittals:

.1 All imported Topsoil materials are to be deemed suitable for use as a growing medium prior being imported to the project location. The Contractor is required to engage an independent agrologist or soil specialist to determine that the imported topsoil materials are suitable for the intended use. A summary report from the Contractor and soil specialist is to be provided to the Owner or Engineer of Record a minimum of 7 days prior to purchase and importation of the material to the project location.

1.4 POST-DISTURBANCE ASSESSMENT BY THE CONTRACTOR

.1 Complete the post-disturbance assessments within 7 days of the completion of the reclamation work including Topsoil placement.

.2 Repair any deficiencies and repeat the post-disturbance assessment at no cost to the Town of Drumheller.

2.0 PRODUCTS

2.1 MATERIALS

Provide materials in accordance with the following:

.1 Topsoil: Topsoil (as defined in Section 02234 – Topsoil and Subsoil Stripping) attained during stripping operations will not require approval from an independent agrologist or soil specialist prior to reuse. Only imported topsoil will require approval from a soil specialist (hired by the contractor) prior to utilization. The Owner will inspect the stockpile of stripped topsoil for contamination before being reused on site.

.2 Subsoil: Subsoil specifications as defined in Section 02234 – Topsoil and Subsoil Stripping. Provide Subsoil from stockpiles of materials produced from required stripping operations. Subsoil removed from the project location should be assumed to be waste soil and is to be disposed of. Subsoils from the project location may also be used for surficial grading in areas outside of the dike footprint and where grade supported structures are not proposed to be installed.

.3 Herbicide: “Round-Up” or other approved chemical base glyphosate equal.

3.0 EXECUTION

3.1 PREPARATION - GENERAL

.1 Locate and protect utility lines, fencing, survey reference points, instrumentation, structures, culverts, and all other items before commencement of the Work.

3.2 PREPARATION –STOCKPILED TOPSOIL

.1 Control and eliminate all perennial grass and weeds including their root systems until native stockpiled topsoil is required for use. Stockpiled topsoil shall be reasonably free of all perennial grass and weed growth before being placed and spread on site.

.2 Perform weed control, as necessary, in accordance with relevant government chemical pesticide application legislation. Obtain the Owners’ approval for all pesticide applications.

.3 Submit detailed pesticide applicator’s log for verification after each application of approved pesticide.

.4 Imported topsoil will require approval from an independent agrologist or soil specialist prior to delivery to site (responsibility of the contractor).

3.3 SUBSOIL PLACEMENT

.1 Subsoil removed from the project location should be assumed to be waste soil and is to be disposed of. Subsoils from the project location may also be used for surficial grading in areas outside of the dike footprint and where grade supported structures are not proposed to be installed.

.2 Apply herbicide 10 days in advance of grading to kill existing weeds and grasses on-site, if required by the Owner.

.3 Where Subsoil is to be utilized at the project location, remove snow, ice, excess water, large rocks, and deleterious materials from surfaces to receive the Subsoil. Do not commence Subsoil placement until the Owner has inspected the prepared surface areas. Rectify any defects identified by the Owner or Engineer of Record.

.4 The combined subsoil thickness is not to exceed 300 mm at any location. The Subsoil is to be placed to a uniform thickness on a prepared surface prior to placement of Topsoil.

.5 Where utilized at the project location, place Subsoil in an unfrozen condition, and spread and compact the material to obtain a minimum Standard Proctor Density of 92% in accordance with ASTM D698. Alternately, the Subsoil can be compacted by performing a minimum of 4 passes utilizing a minimum 10-ton compactor. A single pass means the complete coverage of the fill lift. Overlap required for complete coverage will not be considered to provide any portion of a subsequent or previous pass. The Owner or Engineer of Record can increase or decrease the number of passes required based on the equipment being utilized by the contractor, and the condition of the fill material and subgrade at the time of placement.

3.4 SUBGRADE/FILL AREA PREPARATION PRIOR TO TOPSOIL PLACEMENT

.1 Remove excess water from subgrade and/or fill surfaces.

.2 Grade the subgrade and fill areas to eliminate uneven areas and to provide proper drainage.

.3 Remove roots, rocks greater than 80 mm in diameter, debris, and other deleterious materials that are on top of the subgrade or fill soils.

.4 Disc/scarify the subgrade and fill areas when lumps larger than 80 mm are prevalent.

3.5 TOPSOIL PLACEMENT

.1 Do not commence Topsoil placement until the Owner has inspected the prepared subgrade.

.2 Rectify any defects as required by the Owner.

.3 Topsoil placement will not be allowed to proceed, if in the opinion of the Owner, there is inadequate soil moisture after seeding for germination and there will be insufficient time left in the growing season to allow the vegetation to root and thereby minimize soil erosion.

.4 Place Topsoil in an unfrozen condition, in dry, calm weather.

.5 Spread the Topsoil to provide a uniform 100 mm thickness over the entire area as specified in the Contract Documents or as directed by the Owner or Engineer of Record.

.6 Remove weeds, roots, rocks greater than 25 mm in diameter, debris, and other deleterious materials from the Topsoil.

.7 Manually spread Topsoil around structures, culverts, fences, instruments, or other obstructions.

.8 Grade the Topsoil to eliminate uneven areas, and to provide positive drainage.

.9 Use the track weight of a crawler tractor or dozer to compact Topsoil. A sod roller can be utilized within recently sodded areas.

.10 Minimize traffic on placed Topsoil to prevent over–compaction. If Topsoil becomes over-compacted, rework to meet specified requirements.

.11 Topsoil placement is not to be completed around areas of riprap bank stabilization work until which time riprap placement has been completed to avoid disturbing finished surfaces and subsequent rework.

3.6 FINISH GRADING (SURFACE PREPARATION) PRIOR TO SEEDING

.1 Eliminate rough spots and low areas to ensure positive drainage away from building faces and walkways. Prepare a loose friable topsoil bed by means of cultivation and subsequent raking. Maintain levels, profiles and contours of subgrade.

.2 Rake and/or harrow the Topsoil surface to produce a loose friable bed to a depth of 50 mm and not less than 25 mm prior to seeding.

.3 Provide a finished Topsoil surface that is ready for seeding and that does not require additional preparation of any kind.

.4 Do not cover catch basins, valve covers or manholes. Cut smooth falls to the catch basin rim, and finish flush. Provide smooth transitions at top and bottom of slopes.

.5 Float and leave surfaces smooth, uniform, and sufficiently firm against deep foot printing with a fine loose texture. Finish surface shall be clean, even and free from irregular surface changes.

.6 Grading work shall not be performed when moisture content of soil is such that excessive compaction will occur, or when soil is so dry that clods will not break readily, or dust will form in the air. Apply water as required to prevent the formation of an airborne dust nuisance and to provide ideal soil moisture content for tilling.

.7 Ditches: Finish ditches and swales to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.

.8 Sod: Keep topsoil surface 25 mm below finish grade for sodded areas adjacent to walkways, curbs, edging materials, other hard surfaces and crown of adjacent existing turf. Elsewhere, bring topsoil up to grade as indicated on drawings.

.9 Seeding will not be permitted on hardened, crusted or rutted soil.

3.7 SURFACE TRACKING PRIOR TO HYDROSEEDING/BROADCAST SEEDING

.1 Surface Tracking is the roughening of the Topsoil moving a tracked tractor or dozer, or other mechanical means acceptable to the Owner, up and down the slope leaving depressions perpendicular to the slope direction, to provide a serrated texture that will reduce erosion potential.

.2 Perform Surface Tracking in accordance with Alberta Transportations B.M.P. #34 (a-c) of the Field Guide for Erosion and Sediment Control, except as modified herein.

.3 Perform Surface Tracking prior to Hydroseeding or Broadcast Seeding.

.4 During Surface Tracking, avoid turning movements or changes in directions that causes loosening or disturbance of the Topsoil. Limit the number of track passes to 1 or 2 times to avoid over compaction.

.5 Surface Track the following areas:

.1 All cut and fill slopes with slopes steeper than 3H:1V with a vertical height greater than 1.5 m.

.2 All cut and fill slopes with a slope length greater than 8 m regardless of the actual slope angle.

3.8 CLEAN-UP

.1 Clean up, immediately, any soil or debris spilled onto roads, walkways, and other finished surfaces. Keep site clean and tidy at all times.

.2 Dispose of roots, debris, and other deleterious materials at the specified waste disposal area or at an off-Site waste disposal facility.

.3 Pick and dispose of any rocks greater than 70 mm diameter that appear prior to the date of Substantial Performance of the Work.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide hydroseeding in accordance with the following standards (latest revision) except where specified otherwise.

.2 Government of Canada

.1 Seeds Act and Seeds Regulations

.3 Government of Alberta

.1 Weed Control Act and Weed Regulation.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 The following test results at least 15 days prior to the delivery of seeds to the Site.

.1 Seed Certificates of Analysis for each lot of seeds to be supplied with test results prior to seed blending and procurement showing:

.1 germination rate, or when native seeds are specified and are not a part of the seed tables, the Tetrazolium results, and

.2 purity.

.2 Seed mix composition expressed as a percentage of each seed species by dry mass for each seed mix specified.

.3 Calibration certificate for the hydroseeding equipment.

.4 Substitutions to specified seed species and variety require written approval of the Owners Representative before sowing. Contractor shall submit documentation from seed supplier verifying unavailability of any specified seed species and variety with recommendations.

.5 The Contractor shall incorporate a soil amendment agent into the seeding operations. The soil amendment material/agent must be on Alberta Transportation's Product List under either Proven or Trial Products. The Contractor shall submit the product information for review prior to seeding operations commencement.

1.3 QUALITY CONTROL

.1 Retain a Registered Seed Laboratory to conduct specified seed testing.

.2 Contractor: Experienced and knowledgeable in landscape work of contract.

.3 Site Supervisor: Competent, experienced and knowledgeable to direct and supervise all staff and work of contract. Supervisor shall possess a Landscape Journeyman Gardner certification or other similar qualification acceptable to the Consultant.

.4 Staffing: Experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site. Contractor shall not assign any worker that the Consultant deems incompetent, careless, insubordinate, or otherwise objectionable to work on site.

.5 Contractor shall be responsible for ensuring that contract specifications are being adhered to. Failure of the Consultant to immediately reject unsatisfactory workmanship or to notify the Contractor of their deviation from the specification shall not relieve the Contractor of their responsibility to repair and/or replace unsatisfactory work.

.6 Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and materials.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Provide seed in standard containers clearly labelled with the following information:

.1 Name and address of manufacturer and supplier.

.2 Lot number.

.3 Net mass.

.4 Mixture Composition: Names and percentages of individual seed species.

.2 Protect seed from direct sunlight, moisture, mould, and other detrimental conditions, 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.

2.0 PRODUCTS

2.1 SEED MIXES

.1 The following seed mixtures shall be used on the project:

.1 Wet Tolerant Seed Mix 1 – Below 1:2 year high water mark – Application Rate of 58 kg / ha.

Site Characteristics	
Seeding Method	Hydro-seeding
Habitat Type	wetland
Natural Subregion	Dry Mixedgrass

Botanical Name	Common Name	Target Cover	% of Seed Mix (PLS)	Kg Required (PLS)
Deschampsia ceaspitosa	Tufted Hairgrass	25%	3%	1.97
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	20%	32%	18.60
Bromus carinatus	Mountain Brome	5%	10%	5.68
Elymus trachycaulus / Agropyron trachycaulum var.	Slender Wheatgrass	10%	11%	6.39
Elymus canadensis	Canada Wildrye	15%	23%	13.34
Spartina pectinata	Alkali Cordgrass	25%	21%	11.66

.1 Cover Crop for Wet Tolerant Seed Mix 1: Add a cover crop of Beckmannia Syzigachne (Slough Grass) at 5kg / ha in areas of highwater erosion prone areas.

.2 Upland Seed Mix 2A – Upland Areas - Application Rate of 58 kg / ha.

Site Characteristics	
Seeding Method	Hydro-seeding
Habitat Type	deciduous forest
Natural Subregion	Dry Mixedgrass

Botanical Name	Common Name	Target Cover	% of Seed Mix (PLS)	Kg Required (PLS)
Elymus lanceolatus / Agropyron dasystachyum	Northern Wheatgrass	15%	16%	9.30
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	20%	30%	17.36
Elymus trachycaulus / Agropyron trachycaulum var.	Slender Wheatgrass	10%	10%	5.97
Bouteloua gracilis	Blue Grama	10%	2%	0.88
Elymus canadensis	Canada Wildrye	10%	14%	8.30
Nassella viridula / Stipa viridula	Green Needlegrass	25%	27%	15.82
Koeleria macrantha	Junegrass	10%	1%	0.58

.1 Cover Crop for Upland Seed Mix 2A: Add a cover crop of Lolium multiflorum (Annual Ryegrass) at 5kg / ha for entirety of Upland Seed Mix areas.

.3 Top of Berm Seed Mix 3 – Top of Berm - Application rate of 50 kg/ha.

Site Characteristics	
Seeding Method	Hydro-seeding
Habitat Type	Deciduous forest
Natural Subregion	Dry Mixedgrass

Botanical Name	**Common Name**	**Target Cover**	**% of Seed Mix (PLS)**	**Kg Required (PLS)**
Elymus lanceolatus / Agropyron dasystachyum	Northern Wheatgrass	23%	46%	22.91
Pascopyrum smithii / Agropyron smithii	Western Wheatgrass	10%	23%	11.16
Bouteloua gracilis	Blue Grama	20%	6%	2.83
Hesperostipa comata / Stipa comata	Needle and Thread	2%	4%	2.13
Poa sandbergii	Sandberg Bluegrass	15%	6%	3.07
Nassella viridula / Stipa viridula	Green Needlegrass	5%	9%	4.24
Koeleria macrantha	Junegrass	23%	4%	2.13
Dalea purpurea	Purple Prairie Clover	2%	2%	1.02

.1 Cover Crop for Top of Berm Seed Mix 3: Add a cover crop of Lolium multiflorum (Annual Ryegrass) at 5kg / ha for entirety of Top of Berm Seed Mix areas.

.2 Ensure seed mixture is free of any weed seeds listed as “Prohibited Noxious” or “Noxious” under the Weed Control Act and seeds of other species that will interfere with the growth of the specified seed mixture.

.3 Fertilizers:

.1 Do not apply fertilizers where native seed mixes are applied.

.4 Water: Free of impurities that would inhibit or adversely affect germination and growth of the seed.

3.0 EXECUTION

3.1 PREPARATION

.1 All areas are to be prepared prior to placement of seed.

.2 For areas with slopes steeper than 3 horizontal : 1 vertical, all Native Seed Mixes listed above to be installed at rate of 60 kg / ha.

.3 Preparing surface prior to placement of seed or the supply and application of amendments shall be considered incidental to Work and no separation or additional payment will be made.

3.2 OPTIMAL SEEDING PERIODS FOR NATIVE GRASSES

.1 Mid to late May, early June – no later than June 15th.

.2 Late September – after first hard frost, when plants go dormant. Do not seed near end of season until the risk of seed germination is low. Seed that germinates and does not fully establish prior to end of growing season will likely not overwinter.

3.3 HYDROMULCHING WITH COVER CROP

.1 Any of EcoAnchor, Promatric or Flexterra® High Performance-Flexible Growth Medium™ (HP-FGM™) are acceptable and commonly used hydro mulch and contain 80% wood fibers (see component below).

.1 Thermally Processed* (within a pressurized vessel) Virgin Wood Fibers – 80%

.1 *Heated to a temperature greater than 380 degrees Fahrenheit (193 degrees Celsius) for 5 minutes at a pressure greater than 50 psi (345 kPa)

.2 Wetting agents (including high-viscosity colloidal polysaccharides, cross-linked biopolymers, and water absorbents) – 10%

.3 Crimped Biodegradable Interlocking Fibers – 5%

.4 Micro-Pore Granules – 5%

.2 Water: free of impurities that would inhibit germination and growth.

.3 Application rate: As recommended by manufacturer's written technical data for the % slope upon which it is being applied.

.4 Preparation of slurry

.1 Refer to manufacturer's recommended procedures.

.5 Slurry application

.1 Hydraulic seeding equipment:

.1 Slurry tank.

.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.

.3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.

.4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".

.5 Before application, ensure hydro seeding/mulching truck tank is clean. Thoroughly flush the tank, pumps and hoses to remove all material.

.2 Hydromulch slurry mixture applied per hectare.

.1 Only covercrop seeds are to be installed per hydromulch method.

.2 Hydromulch mixture: Application rate as recommended by manufacturer's written technical data for % slope.

.1 Recommended hydromuch application to be 5000 kg/ha to 5500 kg/ha due to limited access and inability to apply secondary slurry.

.2 Adjust application rate based on slope gradient, as recommended by manufacturer.

.3 Follow manufacturer's recommendations for application.

.1 Follow a two (2) application method, as directed by manufacturer, to increase germination results and enhance erosion protection.

.4 Blend application 500 mm into adjacent grass areas or sodded areas to form uniform surfaces.

.5 Re-apply where application is not uniform.

.6 Remove slurry from items and areas not designated to be sprayed.

.7 Optimal seeding periods for native grasses are:

.1 Mid to late May, early June – no later than June 30.

.2 Late September – after first hard frost, when plants go dormant.

.8 Do not seed near end of season until the risk of seed germination is low. Seed that germinates and does not fully establish prior to end of growing season will likely not overwinter and will require re-application at no additional cost to the Owner.

.9 Do not hydroseed on frozen ground, snow or during adverse weather conditions. Do not hydroseed within 24 hours of rainfall, or if rain is forecast in the next 24 hours.

3.4 NOTIFICATION OF COMMENCEMENT OF WORK

.1 Notify the Owner at least 48 hours prior to any seeding work. Do not commence seeding operations until all areas designated for seeding have been prepared to the satisfaction of the Owner.

.2 Do not commence seeding operations until the Owner has reviewed the Certificate of Seed Analysis and verified the specified seed mix composition supplied.

3.5 WEATHER CONDITIONS

.1 Do not proceed with the work when, in the opinion of the Owner, weather conditions are unsuitable. The Owner will not allow work to proceed when wind conditions are such that material is being carried beyond the designated work areas or that the material is not being uniformly applied.

.2 Do not perform work under adverse field conditions such as wind speeds over 10 km / h.

.3 Provide prepared surfaces that are free of frost and standing water.

3.6 PROTECTION

.1 Take care to prevent the contamination of structures, signs, guardrails, fences, utilities, and other installations from the seeding operations. Remove offending contamination using methods acceptable to the Owner.

.2 Protect existing work, and the Work of the Contract, and repair any damage to such Work.

3.7 WATERING

.1 Water the seeded areas after seeding to achieve germination and a uniform stand of grass. The Owner will determine the watering schedule and will provide the Contractor with at least 24 hours advance notice to commence watering seeded areas.

.2 Apply water uniformly to seeded areas without causing displacement or erosion of the materials and topsoil.

.3 Minimize travel on seeded surfaces.

.4 Use watering equipment and techniques authorized by the Owner.

3.8 RESEEDING

.1 At locations that fail to show a uniform stand of grass for any reason during the calendar year following the year of initial seeding, repair the defective locations as determined by the Owner. A uniform stand of grass will be considered as grass that shows no deterioration or exposed soil greater than 1 square metre in size and provides a minimum of 80 percent ground cover as determined by the Owner.

.2 The Owner will inspect the seeded areas during the month of May of the calendar year following the year of initial seeding. Complete any required reseeding work prior to June 15 of that year. This date will be extended if, in the opinion of the Owner, the weather conditions prior to June 15 are not suitable for reseeding Work.

.3 Meet all the requirements for initial seeding, including seeding method, seed compositions, [fertilizer composition], and application rates, Surface Tracking as applicable.

.4 Contractor will not be required to reseed any area more than once.

.5 The Contractor shall reseed as required during the warranty period to ensure uniform growth. Any costs associated with reseeding during the warranty period shall be considered incidental and no separate or additional payment will be made.

3.9 MAINTENANCE LOG REQUIREMENTS

.1 Maintain and complete a maintenance log for each day of maintenance activity throughout maintenance period.

.2 Submit maintenance log data to the Consultant each week for verification and approval of services performed. Contractor shall ensure maintenance log data is true and accurate. Site supervisor must complete and sign maintenance log.

.3 Record all maintenance activities including date/time of activities, quantity of water applied on site, materials used and quantity in maintenance of sodded areas, location where activities were carried out, number of employees and name of supervisor on site.

3.10 FINAL ACCEPTANCE AND TERMINATION OF INITIAL MAINTENANCE

.1 For final acceptance of seeded areas, the following percentages of cover much be achieved:

End of Growing Season	Percent Coverage Target	Comments
1	35 - 50%	
2	70%	**Required for Final Acceptance Certificate** 70% coverage with 40% native species – seeded areas Less than 5% noxious weeds

.2 Procedure for measuring percentage coverage:

.1 Plant cover estimation will occur within 5% of the planting area, within randomly placed 1 m by 1 m quadrats. (e.g., 120 m^2 area = 6 quadrats, 80 m^2 area = 4 quadrats)

.2 The area of plant cover measured is the area of ground that is occupied by the above-ground parts of each species when viewed from above, measured as a percent of the area of reference (quadrat).

.3 To record percentage cover in a quadrat, look down on the quadrat from above and estimate the percentage cover occupied. Complete cover with no bare ground would equal 100% cover.

.4 Quadrats will be randomly spaced throughout the seeded area and will include a range of plant coverage of the landscape, from highest to lowest plant coverage.

.5 Document percent cover estimates with representative photos of each quadrat.

.6 Utilize Alberta's Range Health Assessment Guidelines – Field Worksheet for Grasslands (Alberta Sustainable Resource Development 2005) Percent Cover Examples as a guideline for estimating percent cover within the quadrat.

.7 Volunteer species and cover crops are not acceptable substitutes in percent coverage calculations.

.8 The Owner will be sole judge of assessing compliance with percentage of cover requirements.

3.11 CLEAN-UP AND REPAIRS

.1 During work of contract, keep all hard and soft surfaces clean and tidy. Sweep and wash all walkways and other pavement surfaces to maintain clean appearances. Clear soil and rubble from catch basins, manholes, valves and other hard surface features.

.2 Collect all litter and other debris from site during work of contract.

.3 Remove and dispose of excess materials, soil, litter, debris, and grass clippings at approved disposal site. Contractor shall be responsible for all disposal costs.

.4 Repair all damages resulting from Work of this Contract.

3.12 WARRANTY

.1 Contractor shall provide warranty for all seed, related works and other materials for a minimum period of two years, inclusive of two full and complete growing seasons (May 1st to October 30th) commencing from the Date of Construction Completion.

.2 The Owner reserves the right to extend the Contractor's warranty responsibilities for an additional one (1) year or as determined by the Consultant on all replacement sod where colour, growth and development are not sufficient to ensure future survival.

.3 During the warranty period, the Contractor shall immediately reseed all areas which ae dead or unhealthy or / in unsatisfactory growing condition and shall install replacement sod in accordance with the Contract Specifications.

.4 The Owner shall be the sole judge as to condition of seed regarding warranty replacements.

END OF SECTION

PART 1 GENERAL

1.1 MAINTENANCE PERIOD

.1 Maintain exterior landscape work for a minimum of 12 (twelve) months, over a two-year period after Date of Construction Completion Acceptance of the landscape portion of Work in Contract. The Contractor shall start the maintenance work one month after Construction Completion Acceptance by the Consultant.

.2 Maintenance services shall generally be performed during the landscape growing season (May 1st to September 30th). The Consultant reserves the right to determine actual date of commencement and termination of maintenance based on existing climatic conditions, soil moisture and plant health.

.3 Any additional maintenance beyond the specified maintenance and warranty period required for Contractor to achieve final acceptance shall be provided at the Contractor's own expense.

.4 Any incomplete weeks or months of maintenance shall be carried over to the following landscape growing season.

.5 The Consultant reserves the right to extend the maintenance period and / or reduce monthly progress payments for maintenance services any time the Contractor neglects to provide adequate maintenance services in accordance with the Contract Specifications, as determined by the Consultant.

1.2 MAINTENANCE SCHEDULE

.1 The Contractor shall submit a neat, legible and detailed maintenance schedule prior to commencement of maintenance period. List all daily, weekly, and monthly maintenance services and tasks to be perform.

1.3 QUALITY CONTROL

.1 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and maintenance work of contract. Supervisor shall possess a Landscape Journeyman Gardener certification or other similar qualification acceptable to the Consultant. Submit supervisor's credentials for the Consultant's approval prior to commencement of work.

.2 Weekly Site Visits: provide adequate site visits each week with sufficient staff to ensure that all required maintenance services are performed and completed on schedule in accordance with specifications.

.3 Site Security: Contractor's personnel shall carry personal identification at all times while on site. Identification shall be presented when requested. All employees must check in with the Consultant upon entering and leaving the premises where applicable.

.4 Employee Attire/Safety Vests: all workers shall be properly attired at all times. Each employee working on site shall wear a reflective brightly coloured safety vest for safety and visibility.

.5 Submittals: submit all required information and documents for the Consultant's approval where specified in the Contract Documents and applicable to work of the Contract and as requested by the Consultant.

1.4 SAFETY PRECAUTIONS

.1 The Contractor shall supply and ensure that all workers use appropriate personal protective equipment as required by Alberta's Occupational Health and Safety Act, Regulations and Code.

.2 The Contractor shall provide training and ensure all workers practice appropriate safety measures and safe use of tools and equipment in accordance with WHMIS GHS (Workplace Hazardous Materials Information System).

.3 The Consultant reserves the right to have the Contractor remove any employee from site if not wearing personal protective equipment or if not practicing safe work procedures.

.4 Regulatory Requirements: perform work in accordance with all applicable laws, codes and regulations required by authorities having jurisdiction over such work and provide all permits required by local authorities.

1.5 SITE INSPECTION / MEETINGS

.1 The Contractor and the Consultant shall have a start up meeting prior to starting maintenance for each year following Construction Completion. This meeting will be held on site to review the status of the project and outline any special considerations for the upcoming maintenance period.

.2 During the initial maintenance establishment period, site meetings and inspections shall be conducted every two weeks or less between the Contractor and the Consultant. The Contractor's workmanship and performance will be reviewed, and other landscape concerns or issues addressed and evaluated.

.3 Subsequent site meetings and inspections shall be held every 30 days or less after landscape has adequately established, as determined by the Consultant.

.4 The Consultant shall, at their discretion, conduct random site inspections throughout the maintenance period to evaluate work performed. The Contractor shall promptly correct all deficient work within three days of the Consultant's notification.

1.6 MAINTENANCE LOG REQUIREMENTS

.1 Maintain and complete a maintenance log for each day of maintenance activity throughout the maintenance period.

.2 Submit maintenance log data to the Consultant each week for verification and approval of services performed. The Contractor shall ensure maintenance log data is true and accurate. Site supervisor must complete and sign maintenance log.

.3 Record all maintenance activities including date/time of activities, quantity of water supplied and applied on site, materials used and quantity during maintenance of landscape installations, location where activities were carried out, number of employees and name of supervisor on site.

.4 Maintenance Invoices: invoices submitted without verifiable maintenance log data to support the invoice will not be accepted. The Consultant will defer payment of the Contractor's invoice until all maintenance services are deemed acceptable and in compliance with specifications as determined by the Consultant.

1.7 SOIL ANALYSIS

.1 The Contractor shall perform all horticultural soil tests during the maintenance period at seed, turf, and planting locations randomly selected by the Contractor. The Contractor shall arrange and pay for the services of an accredited testing laboratory subject to the approval of the Consultant.

.2 The Contractor shall submit an original copy of each soil test to and review the results with the Consultant.

.3 Soil analysis for horticultural use shall include results for: existing major soil nutrients; soil pH value; total soluble salts (electrical conductivity); percentage of organic matter; soil texture and percentage of sand, silt and clay; nutrient recommendations; and recommendations for soil amendments, including fertilizer type and application rate.

.4 The Contractor shall amend soil conditions as recommended by soil analysis report and indicate all corrective measures taken, documenting final soil condition results in the maintenance log.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Remove all equipment and materials off site each day unless on site storage is approved by the Consultant.

.2 Store tools, equipment and materials in a secure area when not in use during period of operation and at the completion of each scheduled task.

.3 Contractor shall be present on site to accept delivery of all equipment and/or material shipments. Acceptance of delivery by the Consultant shall not constitute acceptance or responsibility for any of the materials or equipment.

1.9 DAMAGE TO PROPERTY

.1 The Contractor shall be held directly responsible for all damages to private and public property, the personal property of all employees, staff and visitors and the property of adjacent landDFMPs resulting from the actions of the Contractor, the Contractor's employees, subcontractors or representatives who provide service under this Contract.

.2 The Contractor shall immediately report all damages to the Consultant.

.3 The Contractor shall repair, replace or restore all damaged property to its original condition or better as directed by the Consultant. Damages shall be promptly corrected within seven days of approval unless directed otherwise by the Consultant.

.4 Scalping of turf, mechanical damage or injury to plant material, improper plant pruning, and damages resulting from improper use of chemical pesticides and fertilizers will be considered property damage.

.5 All costs associated with the repair and replacement of damaged property shall solely be the responsible of the Contractor.

1.10 PROTECTION

.1 Protect landscape plantings and turf areas at all times against damage of all kinds for the duration of the maintenance period. Maintenance includes temporary protections, fencing, barriers, and signs as required for protection. If any plant material or turf becomes damaged or injured because of insufficient protection, the Contractor shall treat or replace plant material or turf at the Contractor's sole expense.

1.11 FINAL ACCEPTANCE AND TERMINATION OF MAINTENANCE

.1 Work under this section may be accepted by the Consultant at the end of the maintenance period provided all requirements for acceptance contained within the Contract documents have been satisfactorily completed.

1.12 MAINTENANCE INSTRUCTIONS

.1 The Contractor shall provide two (2) copies of detailed written maintenance instructions identifying the maintenance and care instructions for all seed, turf areas and plant material installed in the Contract.

PART 2 PRODUCTS

2.1 FERTILIZER:

.1 Synthetic Turf Fertilizer: apply a complete premium grade synthetic fertilizer, granular in composition, with over 50% of total nitrogen derived from a slow or controlled release nitrogen source to maintain turf in a healthy, vigorous, and green condition. Fertilizer shall contain all essential macronutrients plus 1%-2% iron and other micronutrients.

.1 "Weed and Feed" fertilizers are not allowed.

.2 Fertilizer: apply controlled or slow-release fertilizers in accordance with soil analysis where applicable.

2.2 TOPSOIL AND PEAT MOSS:

.1 Topsoil: fertile natural loam, capable of sustaining healthy growth, loose and friable, free of subsoil, clay lumps, stones in excess of 20 mm, live plants, roots or any other deleterious material greater than 20 mm diameter. Topsoil shall be free of litter, foreign matter and toxic materials harmful to plant growth. Topsoil containing construction debris, sod clumps, quack grass or other noxious weeds is not acceptable. Topsoil supplied to site shall meet the following requirements:

.1 Minimum 6% organic matter.

.2 Acidity/alkalinity shall range from 5.9 pH to 7.0 pH.

.3 Electrical Conductivity (E.C.) - level of soluble salts shall not exceed 1.5 dS/m.

.4 Texture: "Loam Topsoil" in accordance with Canadian System of Soil Classification. Topsoil shall fall within an allowance of ±2% of the values stated in the table below:

Soil	Sand (%)	Silt (%)	Clay (%)	Class
Topsoil	35	35	30	Loam

.2 Peat Moss: decomposed plants, fairly elastic and homogeneous, free of decomposed colloidal residue, wood, sulphur and iron. Minimum of 80% organic matter by mass, pH value between 4.5 and 6.0. Furnished in an air-dry state, packed in standard bags or bales showing name of manufacturer.

2.3 WATER:

.1 The Contractor shall submit a detailed watering plan to the Consultant 30 days prior to the start of the maintenance period for review and comments.

.2 The Contractor shall be fully responsible for all aspects of the providing watering requirements during the maintenance period.

.3 No motorized vehicles will be allowed on private property during the maintenance periods.

.4 Supply clean fresh water, water tanker, equipment, sprinklers, and labour necessary to adequately and efficiently apply water to all turf areas and plant materials.

.5 Record quantity of water supplied and applied on site in maintenance log.

2.4 PLANT PROTECTION MATERIALS - RODENT, ANIMAL AND SUN PROTECTION:

.1 Woven wire mesh: galvanized woven wire strands, 1.2 mm wire diameter or suitable alternative with an opening of 12.5 mm x 12.5 mm, c/w fasteners.

.2 Plastic: perforated spiraled strip for horticultural use.

.3 Burlap: clean, minimum 2.5 kg/m mass and 150 mm wide, and twine fastener.

PART 3 EXECUTION

3.1 GENERAL WORKMANSHIP:

.1 The Consultant will be the sole assessor of the Contractor's maintenance performance and workmanship.

.2 Schedule timing of operations to growth, weather conditions and use of site. Do each operation continuously and complete within reasonable time period.

.3 Do not perform work in any location or manner that may endanger the health and safety of the public.

.4 Collect and dispose of excess material and debris to approved municipal disposal site following collection.

.5 Coordinate maintenance practices with Town of Drumheller. Alter maintenance schedules, when necessary, to accommodate Town of Drumheller's site activities.

.6 Contact the Consultant when specified maintenance requirements cannot be met for any reason.

.7 Submit name and contact number of company representative for immediate or emergency service when necessary.

.8 Keep a copy of contract specifications and applicable reference documents on site at all times for employee use and reference.

.9 Contractor's site supervisor must attend all site meetings called by the Consultant to review workmanship and performance.

.10 The Contractor shall promptly correct all maintenance deficiencies noted by the Consultant during site inspection meetings or following notification of the Consultant's own work inspection results.

3.2 SPRING CLEAN-UP:

.1 Complete spring clean-up by May 15th or sooner, weather permitting.

.2 Remove and dispose of protective coverings and mulch used in winter protection.

.3 Clean, sweep, collect and remove sand, rock chips, salt and other debris accumulated during winter months from all maintained turf and hard surface areas. Re-sweep turf and hard surface areas until completely clean and acceptable to the Consultant. Dispose of all collected debris to approved municipal disposal site.

.4 Winter protection materials supplied by Contractor shall be removed from site.

.5 Collect and remove all dead vegetation, leaves, litter, and other debris from turf areas. Rake clean snow mold, where existing, from lawn areas.

.6 Clean all plant beds, raised planters, tree wells, hedges and other landscaped areas of plant debris, leaves, litter, and other foreign matter. Remove collected debris from site.

.7 Loosen and lightly cultivate non-mulched planting soil without disturbing roots of permanent plantings. Reinstall all loose plant bed edging materials and replace where necessary.

.8 Sweep and clean hard surface areas and along curbs to remove all litter and debris to maintain clean and tidy site appearances.

.9 Roll turf areas lightly where grass has lifted due to frost action. Repair damaged or deficient turf areas.

3.3 SEEDING TURF MAINTENANCE

.1 Watering – Seeded and Sodded Areas:

.1 Provide proper and adequate watering services to all seeded and sodded areas to ensure healthy vigorous growing conditions.

.2 Seeded Areas: provide adequate watering of seeded areas to ensure proper seed germination and turf establishment. Supply and operate a portable and mobile irrigation system to water seeded turf areas as necessary until adequately and well established.

.3 Sodded Areas: regularly and adequately apply water to all sodded areas. Water shall be deeply and thoroughly applied to keep new sod and underlying soil from drying out and to ensure healthy vigorous growing conditions are maintained. Apply water during early morning or evening to achieve efficient use of water.

.4 Water Supply: where water is not available, Contractor shall supply clean water, water truck, pumps, portable sprinkler systems and labour and apply water as necessary to maintain healthy turf conditions.

.5 Provide 25 to 40 mm of water weekly including natural rainfall to wet upper 100 to 150 mm of soil in maintained seed and turf areas.

.6 During periods of drought stress, apply additional water to maintain healthy turf conditions if necessary.

.2 Topdressing and Reseeding:

.1 Top-dress and reseed areas which show root growth failure, deterioration, bare, burnt and thin spots, ruts, wash outs and erosion or which have been damaged by any means or cause, including replacement operations.

.2 Mow grass to height of 40 mm. After mowing, rake thoroughly, removing loose and dead grass, stones and debris.

.3 Spread topsoil to maximum thickness of 15 mm, filling in low areas and bare spots. For severely damaged turf areas place sufficient topsoil and rake level with finish grade.

.4 Overseed areas with seed mixture equivalent to existing grasses and approved by the Consultant. Seed at rate of 4 kg/100 m².

.5 Rake seed into topsoil. Roll lightly.

.6 Water to ensure penetration of 80 mm and at frequent intervals to maintain vigorous growth.

.3 Sod Replacement:

.1 Cut out and remove all areas of dead, or unhealthy sod or which has been damaged by any means or cause and replace with new healthy sod. All repair areas to be square or rectangular.

.2 Rake existing topsoil before installing new sod. Add topsoil to fill uneven and low areas.

.3 Butt new sod tightly to adjacent existing sod. Topsoil open and exposed joints.

.4 Water to ensure penetration of 80 mm and at frequent intervals to maintain healthy growth.

.4 Seed and Sod Establishment and Erosion:

.1 Until seeded and sodded areas are established, the Contractor shall be responsible for replacing soils that have eroded into hard surface areas. Residual soils on hard surfaces shall be removed and if not mingled with objectionable materials may be re-used in eroded areas. In the event this is a continuous problem, the Contractor shall install “jute mat” or other methods to prevent the erosion problem until the seed and turf areas are established.

3.4 FERTILIZING

.1 The Contractor shall be responsible for determining the application type and rate for fertilizer to ensure end product specification is achieved. Prior to any fertilizing being completed, the Contractor shall submit a detailed plan for the Consultant’s review and comments.

.2 Apply fertilizer as directed by the Consultant or as indicated in soil analysis. Use only mechanical equipment to spread fertilizer. Check spreader calibration to ensure specified application rate is used.

.3 Spread 50% of fertilizer in one direction, then 50% at right angles.

.4 Synthetic Fertilizer: apply the following slow-release granular fertilizer unless approved otherwise by the Consultant. Indicate total quantity of fertilizer applied on site in Maintenance Log for each turf area.

.5 The following type of fertilizer is for guidance only. The Contractor shall be required to complete Spring, Summer and Fall application as noted at a minimum.

.1 Spring Application: all turf areas. Apply 26-14-6 or similar slow-release granular fertilizer at rate of 3 kg/100 m² by May 20th.

.2 Summer Application: all turf areas. Apply 24-5-11 or similar slow-release granular fertilizer at rate of 3 kg/100 m² by July 15th.

.3 Fall Application: all turf areas. Apply 12-3-18 or similar slow-release granular fertilizer at rate of 2 =kg/100 m² by September 30th.

.6 Water: apply water immediately after spreading fertilizer. Alternatively, Contractor shall time fertilizer applications prior to natural rainfall that will activate the fertilizer and produce the desired response. Ensure moisture penetration of 50 mm minimum.

.7 Advise the County prior to any application of turf fertilizer. Upon completion of service, provide documentation along with invoice to support type and quantity of turf fertilizer applied.

.8 Public notice, to be coordinated through the Consultant, shall be given and posted for each property prior to application.

3.5 MOWING - MAINTAINED AREAS

.1 Mowing Height: cut and maintain turf areas at required variable minimum heights respective of the growing season. During periods of active growth turf shall be mowed at minimum required mowing height. During hot dry conditions and slow growth periods turf shall be mowed at increased or maximum heights to maintain turf health. Turf shall generally be cut and maintained as follows:

.1 Sodded Areas: cut and maintain turf at 60 - 80 mm height.

.2 Seeded Native Grass: provide weed control during seed establishment by mowing weed growth to 100 mm height and remove from site. Mow native seed areas during the last two weeks of June and August or as directed by the Consultant. Mow tall growing native grass at a height of 135 to 150 mm and short growing native grass at a height of 90 to 100 mm. Do not mow native grass lower than specified. Provide an additional cut due to active and/or accelerated growth when directed by the Consultant.

.2 Mowing Schedule: mow sodded areas on weekly intervals during periods of active growth and more frequently during accelerated growth periods to maintain sod at required height. During periods of hot dry seasonal climatic conditions and when sod growth is slow, sod shall be cut less frequently at an increased height to maintain sod health.

.3 Mowing shall generally be performed when **"**one-third**"** of grass blade can be removed during a single cutting to achieve required turf height. Schedule and complete mowing in one continuous operation, weather permitting. Do not mow sod when insufficient growth is evident or cut sod lower than specified height.

.4 Mow areas only when dry. Use mowers with sharp blades that will cut cleanly. Areas mowed when wet or with dull blades that tear and leaves ragged leaf edges are unacceptable. Town of Drumheller will periodically inspect mowers for acceptance.

.5 During periods of extended moisture and excessive sod growth, increase mower blade height and pre-cut sod at an increased height. Remove clippings. After sod dries, lower blade height to specified height and mow sod a second time to achieve required height.

.6 Remove clippings after each mowing. Small and unnoticeable grass clippings may be left on lawns that are regularly mowed at the desired height.

.7 Remove papers, rocks, animal waste, and other foreign material before cutting.

.8 Change direction of cut with each mowing to avoid soil compaction and sod wear or ruts from mower wheels. In the event that sod damage or ruts result, the Contractor shall immediately repair all damaged areas.

.9 During each cutting operation, temporarily relocate movable site furnishings. Replace to approximate original location after mowing lawn.

.10 Trimming: trim grass areas as follows:

.1 trim grass along fences, walls, signposts, structures, monuments and other select lawn areas not accessible to mowers using a mechanical trimmer. Trim turf at a height no lower than 60 mm. Never scalp turf or damage any plant when using trimmers. Remove resulting plant debris from site.

.2 use hand trimmers to trim grass adjacent to trees and other plants to prevent damage to tree trunks, plant stems and roots. Do not use string line trimmers near live plants.

.3 cut and neatly trim grass around irrigation equipment, manholes, valves and other surface features in lawn areas. Remove resulting plant debris from site.

.11 Clean all sidewalks, stairs, roads, parking lots, curbs, hard surfaces, building walls and other required locations of all grass clippings after each mowing to maintain clean site appearances.

3.6 INTEGRATED PEST MANAGEMENT

.1 Manage and control pests using Integrated Pest Management (IPM) principles that utilizes regular monitoring to identify pests, considers various control options (biological, physical, cultural, mechanical and chemical) before implementing an effective, economical and environmentally acceptable solution to prevent and suppress pests.

.2 Use IPM principles to reduce or eliminate a reliance on chemical pesticides.

.3 The Contractor shall be knowledgeable regarding the identification of pests on site, controls to be implemented in management of pests and assessing outcome of treatment actions. Inform the Consultant of all pest concerns on site and controls to be implemented in management of pests. Record all information in the maintenance log.

3.7 PESTS: WEED, INSECT AND DISEASE CONTROL

.1 Pest Monitoring:

.1 Pest Monitoring: regularly monitor and visually inspect all plants, turf and other landscape areas to identify potential pest problems and determine appropriate pest controls. Pest problems include insect, disease and weed infestations that pose a serious and on-going threat to plant life on site.

.2 Ensure proper, positive identification of infestations. Reference “Backyard Pest Management” for identification and control of pests.

.3 Indicate results of each monitoring inspection in maintenance log. Review all pest concerns with the Consultant. Record all actions taken to control pest problems in log.

.2 General Considerations:

.1 Use of chemical pesticides are restricted as Town of Drumheller supports the use of IPM practices. Advise Town of Drumheller on whether IPM practices are practical in managing and controlling any existing pests on site.

.2 Determine susceptibility of plant species to pesticide damage before requesting chemical pesticides. Request the Consultant’s approval before use, where chemical pesticides are deemed necessary in the management and control of pest infestations.

.3 Applications of pesticides shall be performed in accordance with Alberta Environment's current legislation. Provide the Consultant with three days advance notification of intent to apply chemical pesticides on site.

.4 Use equipment and containers free of harmful residues not related to specific control measures applicable to situation.

.5 Certified Applicator: when pesticides are deemed necessary to control pests, the application of each pesticide on site shall be performed by a certified pesticide applicator. Personnel assisting the certified applicator on site shall be thoroughly trained and knowledgeable in pesticide applications and use of all equipment in accordance with Alberta Environment's Code of Practice for Pesticides. Applicator shall maintain pesticide application record books and submit at completion of each pesticide application.

.6 Prepare and apply pesticide according to manufacturer's specifications. Minimize drift at all times. Erect signs to notify building occupants and the public regarding pesticide use on site.

.7 Timing: pesticides shall be applied at times, which limit any possibility of contamination from climatic and other factors. Monitor weather conditions to avoid making application prior to inclement weather to eliminate potential runoff from treated areas. Confine all applications to outside of regular site operation hours to avoid contamination from drift and its effect on surroundings, occupants of nearby buildings and site users.

.8 Ineffective and improper application of pesticide shall be immediately terminated and corrected by Contractor. Additional application of pesticides shall be completed approximately two weeks after initial application is noted as visibly inadequate or deemed deficient by the Consultant.

3.8 PEST CONTROL

.1 Weeds:

.1 Provide ongoing weed control and eradication methods during active growth and establishment, by cultivation, physical removal and use of approved chemical pesticides.

.2 Completely eliminate and remove from site all noxious weeds in accordance with government regulations.

.3 Control and elimination of weeds within soft and hard landscaped surfaces on site on an ongoing basis. Ensure weed seed heads are removed before maturity.

.2 Insects and Disease:

.1 Apply pesticides based on development stage of insects' life cycles to prevent loss or damage to plant material. Monitor turf areas and plants and apply pesticides, if approved, to control pest infestations.

.3 Monitor effectiveness of each pesticide application and promptly correct any inadequate or deficient application.

.4 Repair and pay for damage caused by application of herbicides.

.5 Do not use soil sterilants.

.6 Eliminate rodents using controls and methods approved by Town of Drumheller.

3.9 AUTUMN PREPARATION

.1 Leaf Removal: rake and vacuum fallen leaves weekly and remove from site to approved waste recycling depot. Continue until leaves cease to fall.

.2 Clean all plant beds, planters, tree wells, mulched areas, and other landscaped areas on site weekly. Keep catch basins and all road and parking curbs clean and free of all debris. Remove all collected leaves and other debris to approved waste recycling depot.

.3 Remove and dispose of annuals from plant beds and planters within one week after first killing frost or when directed by the Consultant. Deep cultivate plant beds and planters.

.4 Cut back foliage of perennial plants within one week after killing frost. Ornamental grass shall remain intact during winter and trimmed back the following spring unless directed otherwise by the Consultant. Stake locations of cut perennials and apply organic mulch around plants for winter protection as necessary. Thoroughly water all perennial plants for winter.

.5 Deep root water all plants between September 15th and September 30th in preparation for winter. Supply water, trucking and other necessary accessories to adequately apply water to each plant. Trees to receive minimum 40 liters of water per 25 mm of trunk diameter (measure at 300 mm above ground level). Apply water throughout tree dripline area. Saturate root area of shrubs, perennials and other plants. Record total quantity of water applied in maintenance log after each day of plant watering activities. Indicate quantity of plants watered each day and their location in maintenance log. Provide additional deep root watering services when warm dry temperatures are experienced in late fall to maintain plant warranty.

.6 Protect plants from rodent, animal and sun damages by installing appropriate protective materials.

.7 Sweep and clean all walkways and other hard surface areas weekly. Remove all collected debris and litter from site.

.8 Supply and erect snow fencing, as necessary, in protection of new landscape installations and as directed by the Consultant.

3.10 CLEANLINESS OF GROUNDS

.1 Keep grounds in clean and tidy condition to ensure clean site appearances are continually maintained. Provide minimum twice monthly clean-up services as directed by the Consultant. Sweep, clean, collect and remove all debris, litter, rubbish and pests from project limits.

.2 Provide prompt service, within 3 hours, when directed by the Consultant to correct or complete clean-up services deemed inadequate or incomplete.

.3 Pay all costs for collecting and disposing of excess material and debris to municipal disposal site following each site clean-up. Do not dispose of any debris in Town of Drumheller disposal bins on site.

.4 Sweep and clean all walkways and other hard surface areas weekly, or more frequently, as required. Provide mechanical power wash equipment to clean and wash paved surfaces near buildings if directed by the Consultant.

.5 Record all cleaning services performed each week in the maintenance log.

.6 Make weekly inspections for vandalism and damage. Immediately report vandalism and damage to the Consultant. Note all findings in the maintenance log.

.7 Provide same day response to the Consultant's request to correct, repair, and adjust damage or defacement of plant materials caused by vandalism, accident or weather.

END OF SECTION

1.0 GENERAL

1.1 DEFINITIONS

.1 Live Cuttings: Branches and stems of suitable native shrubs and trees species which have properties of vegetative propagation (i.e., willow).

.2 Bioengineering: An engineering technique of integrating living woody and herbaceous materials with organic and inorganic materials to increase the strength and structure of the soil and create or enhance fish and wildlife habitat.

.3 Bioengineering Specialist: A person with a minimum of 10 years training and experience in soil bioengineering applications, biotechnical slope stabilization, erosion control and riparian habitat restoration.

1.2 EXTENT OF LIVE CUTTINGS

.1 Live Cuttings are required to be planted above the proposed instream riprap location in as specified in the Contract Documents or as designated in the field.

1.3 SUBMITTALS

.1 Provide the following submittals.

.1 The proposed source of Live Cuttings including the location of harvest in UTM coordinates, and the approach to harvest, store, deliver, and handle Live Cuttings at least 20 days prior to commencement of harvesting.

.2 Live Cuttings planting plan, at least 20 days prior to commencement of harvesting.

.3 An Irrigation Plan including a drawing of the proposed layout including temporary irrigation components, control zone components, list of required materials, installation details, and description of how the system will be operated. Provide the Irrigation Plan at least 30 days prior to installing the irrigation system.

.4 Submit copies of permits licenses, and approvals by regulatory agencies where required for water withdrawals from the Red Deer River, Town municipal water supply, or other water sources.

.5 Submit copies of permits, licenses, and approvals by regulatory agencies and/or land managers for the harvesting of Live Cuttings.

1.4 HARVESTING, DELIVERY, STORAGE, AND HANDLING

.1 Harvest Live Cuttings during the dormant season, which typically extends from October 1 to March 31.

.2 Harvest healthy cuttings that are not suffering from visible signs of disease, dead stems (brown coloured under bark), or insect attack.

.3 Harvest Live Cuttings by hand using chainsaws or loppers, as close to the ground as possible.

.4 Cut ends of Live Cuttings square and with a clean cut (no bark peeling).

.5 All limbs should be hand pruned close to the stock using pruners or loppers.

.6 Do not expose Live Cuttings to heat or direct sun light after harvesting.

.7 Protect Live Cuttings with Silvicool tarps®, wet burlap, or equivalent at all times during harvesting, transport and construction to keep the Live Cuttings cool, and soak with water daily.

.8 Soak Live Cuttings such that they are fully submerged in oxygenated water, for a minimum of 7 to 14 days prior to installation. Cover the soaking container with Silvicool tarps® or equivalent, and keep shaded at all times.

.9 Schedule and sequence delivery of Live Cuttings so as to minimize the amount of time between delivery and planting to one day. If this is not possible, plantings are to be soaked in oxygenated water on site, and covered at all times using a Silvicool tarps® or equivalent.

.10 For indoor cold storage, temperatures should be no greater than of -2°C and cutting bundles should be wrapped in plastic and/or covered with wet burlap and watered twice a week to avoid freezer burn.

1.5 QUALITY CONTROL

.1 Provide the services of a qualified landscaping company with a minimum of five years current experience in bioengineering work and a horticulturist with a valid diploma from a horticulture program recognised by the Province of Alberta, to develop a Live Cuttings planting plan including the sourcing, harvesting, delivering, storing, preparing and to be on site during planting of Live Cuttings.

.2 Employ qualified personnel experienced with a minimum of 5 years Bioengineering applications along riverbanks to handle and install the Live Cuttings.

.3 Provide appropriate hand tools to personnel harvesting and installing Live Cuttings.

1.6 QUALITY ASSURANCE

.1 The Owner may retain a Bioengineering Specialist during harvesting to inspect and monitor harvesting activities and to carry quality control during installation. Provide notice at least 20 days prior to commencement of harvesting.

.2 The Owner or its Bioengineering Specialist may reject the harvested Live Cuttings at the harvesting site, in the transport vehicle, or at the project site.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Live Cuttings:

.1 Live Cuttings to be taken from native stands located in Alberta, within 300m of elevation and within 250 km of the site.

.2 The use of multiple harvest sites is recommended to improve genetic diversity.

.3 Willow Live Cuttings to be a minimum of 20 mm in diameter at the tip at the time of planting.

.4 The top 20 to 30 cm of the Willow Live Cuttings should be painted with a mix of 50% latex primer paint and 50% water prior to installation to help reduce desiccation and disease entry. The use of a different color of paint per species is required to facilitate the distribution of the species during installation.

.5 Supply Live Cuttings with the following density, species and length:

.1 Proposed instream riprap location:

Density	Species	Length (m)
20 cuttings / m	70% Sandbar Willow (*Salix exigua*)	1.8 -2.2
	30% Red-osier Dogwood (*Cornus stolonifera*)	1.5 - 1.8

.3 Silvicool tarps®: As manufactured and supplied by Bushpro Supplies Inc. or equivalent.

3.0 EXECUTION

3.1 GENERAL

.1 Deliver Live Cuttings to site in bundles of 10 – 20 Live Cuttings. Inform the Owner when material is delivered, for the purpose of monitoring material quality and quantities. Ensure that the basal end of each Live Cutting is on the same side when tying bundles during harvesting.

.2 Soak full length of Live Cuttings for a minimum of 7 to 14 days, prior to installation in either a water-tight container or in a watercourse or pond. During soaking, protect the Live Cuttings from damage due to wildlife, direct sunlight, heat exposure, drying winds and drying frosts. Cover soaking live cuttings at all times.

.3 Soaking water should be aerated and not be allowed to become stagnate. Water should flow in and out, have an aerator pump working and / or be changed daily.

.4 Plant Live Cuttings one day after delivery. If that is not possible, soak live cuttings on site.

.5 After installation, if necessary, protruding ends of Live Cuttings should be pruned to a maximum of 20 cm, unless specified otherwise in the contract documents. Pruned tips should be re-painted using latex - water mix as described in Part 2.1.2.6.

.6 Ensure that Live Cuttings are protected against damage from wildlife. As a minimum, ensure that Live Cuttings are completely enclosed by a rodent fence or otherwise protected, at the end of each shift or as authorized by the Owner.

.7 Do not allow equipment to travel on planted areas. Protect Live Cuttings from damage due to adjacent construction activities and the general public.

.8 Water Live Cuttings during and after installation daily until temporary irrigation system is in place.

3.2 INSTALLATION OF LIVE CUTTINGS

.1 Place Riprap and Bedding in accordance with the lines, grades, and elevations specified in the Contract Documents.

.2 Plant Live Cuttings such that the basal or butt end of the rolls are inserted down and extend to the native ground beneath the bedding gravel layer with the growing tips protruding approximately 600 to 800 mm above the finished riprap surface.

.3 Place 100 thick layer of topsoil over the exposed stems of the Live Cuttings and water thoroughly.

.4 Place a 200 mm thick layer of Bedding over the Live Cutting Roll and buried stem and water thoroughly.

.5 Carefully place Riprap over Bedding.

.6 Protect the top growth of the Live Cuttings throughout placement of the Live Cuttings, bedding, riprap, and during all construction activity above the Live Cuttings.

.7 Do not allow equipment to travel on planted areas. Protect plantings from damage due to adjacent construction activities, wildlife and the general public.

.8 Provide maintenance work, including watering of all plant material, and chemical, mechanical or manual weed control, as required for plant establishment.

3.3 TEMPORARY IRRIGATION SYSTEM

.1 During construction and any interim period, during the growing season, prior to installation of the temporary irrigation system, ensure that all Live Cuttings and plantings receive the required precipitation rate as specified in Part 3.4.2 and in accordance with weather conditions.

.2 Provide a temporary irrigation system that provides a precipitation rate of 25 mm of water/m^2 per week in applications of no more than 6 hours/week. System can be divided into zones and watered separately, as required. Do not use drip lines. Design the system according to the manufacturer's specifications and installation instructions.

.3 Provide a system that does not cause erosion of the exposed soils, disturbed areas or cause sedimentation in the Bow River.

.4 Flush the system upon completion of installation of the temporary irrigation system and prior to starting operation of the temporary irrigation system. Flush the system completely after any repairs are made and monitor system operation for indications that any blockages have developed.

.5 Subject installed temporary irrigation system to water pressure equal to operating pressures for ten (10) minutes. Test with control zone components and any flush valve components installed. Visually inspect valve assemblies and fittings for leakage and replace defective pipe, fitting, joint, valve or appurtenance. Repeat test until test segment is free from leaks and the system has been inspected and approved by the Owner. Cement or caulking to seal leaks is prohibited. Repeat tests, replace components, and correct deficiencies at no additional cost.

.6 Repair damage to premises, such as, but not limited to, filling and repairing depressions, erosion gullies, and / or settlement, caused by defective items in the irrigation system.

.7 Select a system and products that are compatible with the quality of the proposed water source. Water can be stored on site in maximum 2 m^3 tank(s) for operation of the system during the growing season, upon approval by the Owner.

3.4 ACCEPTANCE

.1 Acceptable Live Cutting establishment will be determined by counting the number of Live Cuttings showing growth at the start of the 2023 growing season and each subsequent year during the Extended Landscape Maintenance period. Acceptable Live Cutting establishment consists of at least 75% survival of the in place number of Live Cuttings as determined by Owner.

.2 All submittals, installation and maintenance requirements have been provided.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide precast concrete headwall structures in accordance with the following standards (latest revision) except where specified otherwise.

.2 Alberta Building Code (ABC)

.3 American Concrete Institute (ACI)

.1	ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

.4 American Society for Testing and Materials (ASTM)

.1	ASTM A276	Standard Specification for Stainless Steel Bars and Shapes.
.2	ASTM A307 Studs, 60,000	Standard Specification for Carbon Steel Bolts and psi Tensile Strength.
.3	ASTM C260/C260M	Standard Specification for Air-Entraining Admixtures for Concrete.

.5 Canadian General Standards Board (CGSB)

.1	CAN/CGSB-1.181	Ready-Mixed Organic Zinc-Rich Coating.

.6 Canadian Standards Association (CSA)

.1	CAN/CSA-A3000	Cementitious Materials Compendium.
.2	CAN/CSA-A23.1	Concrete Materials and Methods of Concrete Construction.
.3	CAN/CSA-A23.2	Methods of Test for Concrete.
.4	CSA-A23.3	Design of Concrete Structures.
.5	CAN/CSA-A 23.4	Precast Concrete – Materials and Construction.
.6	CSA-G30.5	Welded Steel Wire Fabric for Concrete Reinforcement.
.7	CSA-G30.14	Deformed Steel Wire for Concrete Reinforcement
.8	CSA-G30.15	Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
.9	CAN/CSA-G30.18	Billet-Steel Bars for Concrete Reinforcement.
.10	CSA-G40.20	General Requirements for Rolled or Welded Structural Quality Steel.
.11	CSA-G40.21	Structural Quality Steel.

.12 CAN/CSA-G164 Hot-Dip Galvanizing of Irregularly Shaped Articles.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Structural design calculations, mix designs, and shop drawings for the precast concrete structures, stamped and signed by a Professional Engineer registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, at least 20 days prior to manufacture.

.3 Certified copies of the results of the tests specified in clause 1.3 prior to delivering any structure to the Site.

.4 Certified copy of mill test reports of reinforcing steel showing physical and chemical analysis results at least 20 days prior to fabrication.

.5 Manufacturer's written instructions for handling, assembling, and repairing precast concrete elements, and repairing damaged galvanized coating prior to performing the work.

1.3 QUALITY CONTROL

.1 Have precast concrete structure designs performed by a Professional Engineer registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

.2 During manufacture, perform the following tests in accordance with CAN/CSA-A23.2 for each day concrete is placed.

.1 Concrete compressive strength tests at 28 days after concrete placement for at least 2 cylinders obtained from a batch of concrete randomly selected from a particular day's pour.

.2 Slump tests for the same batch of concrete.

.3 Air content tests for the same batch of concrete.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged material.

.2 Handle and transport large precast concrete panels in a vertical position.

.3 Handle all precast concrete elements in accordance with the manufacturer's instructions, utilizing the lifting devices and holes provided.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Precast Concrete Structures:

.1 Design precast concrete structures in accordance with CSA-A23.3 and CAN/CSA-A23.4 to resist the governing combination of loads and other requirements as specified below:

.1 Dead load: Due to the self-weight of the structure. Use a minimum load factor of 1.25, and where required include an impact factor due to handling.

.2 Earth load: Saturated unit weight of backfill of 21 kN/m^3 and a lateral earth pressure coefficient at-rest of 0.5. Use a minimum load factor of 1.25.

.3 Surcharge load: Equivalent to the greater of 300 mm of earth surcharge or due to the compaction equipment to be used for backfilling. Use a minimum load factor of 1.5.

.4 Hydrostatic loads: Phreatic level at the full supply level or at the top of the concrete with water in the structure or the structure empty. Use a minimum load factor of 1.25.

.5 Occupancy live loads on platforms: 4.8 KPa. Use a load factor of minimum 1.5.

.6 Other live loads: Snow loads in accordance with the ABC. Use a minimum load factor of 1.5.

.7 Provide solid walls or slabs having a minimum uniform thickness of 150 mm.

.8 Provide a minimum concrete clear cover for reinforcement of 30 mm.

.2 Design and provide lifting hardware and holes in each precast concrete element.

.3 Concrete reinforcement: Billet-steel deformed bars in accordance with CAN/CSA G30.18, Grade 400 or welded wire in accordance with CSA-G30.5 with a minimum yield strength of 485 MPa.

.3 Structural steel: In accordance with CSA-G40.21, Grade 300W except provide Grade 350W for hollow steel sections, with a minimum zinc coating of 610 g/m^2 in accordance with CAN/CSA-G164.

.4 Connection bolts: Galvanized bolts in accordance with ASTM A307.

.5 Butyl rubber sealant: Conseal CS 302 manufactured by Concrete Sealants Inc. or Kent Seal No. 2 manufactured by Hamiliton Kent Ltd.

.6 Non-shrink, Sulphate-resistant cementitious grout: Sika Grout 212SR as manufactured by Sika Canada, Masterflow 928 as manufactured by BASF or Sulphate Resistant Grout as manufactured by Basalite Concrete Products with a minimum compressive strength of 45 MPa at 28 days.

2.2 CONCRETE MIX

.1 Proportion concrete mixes in accordance with ACI 211.1.

.2 Provide concrete for the precast concrete structures in accordance with the following:

Property	Requirement	Standard or Test Method
Cement	Type HS or HSb Sulphate Resistant	CAN/CSA-A3000
Class of Exposure	F–1	CAN/CSA-A23.1
Minimum cement content	340 kg/m^3	
Maximum water/cement ratio	0.50	
Min. compressive strength @ 7 days	21 MPa	CAN/CSA-A23.2-14C
Min. compressive strength @ 28 days	30 MPa	CAN/CSA-A23.2-14C
Maximum coarse aggregate size	20 mm	CAN/CSA-A23.2-2A
Slump at discharge	80 mm +/- 20 mm	CAN/CSA-A23.2-5C
Air content	5% to 8%	CAN/CSA-A23.2-4C

.3 Concrete Aggregates: In accordance with CAN/CSA-A23.1, and consisting of clean, hard, dense, durable, and uncoated sand particles and rock fragments.

.4 Water: Clean and free from injurious amounts of oil, silt, soluble chlorides, organic matter, acids, alkalis, and other deleterious substances, and in accordance with CAN/CSA-A23.1.

.5 Air entraining admixture: In accordance with ASTM C260/C260M.

.6 Obtain the Owner's authorization prior to using any other chemical admixtures. Do not use calcium chloride or any admixture formulated with calcium chloride.

2.3 SHOP FABRICATION

.1 Install concrete reinforcement and other embedded parts in accordance with CAN/CSA-A23.1.

.2 Produce, place, cure, and finish concrete in accordance with CAN/CSA-A23.1 and CAN/CSA-A23.4, except where specified otherwise.

.3 Do not remove precast concrete components from the casting form bed until the concrete has attained a minimum compressive strength of 21 MPa.

.4 Continuously moist cure all precast concrete components at a minimum temperature of 5°C or steam cure until the concrete has attained a minimum compressive strength of 21 MPa.

.5 Provide finished concrete surfaces that are smooth, hard, and uniformly textured, and free of surface defects, irregularities, and other imperfections.

3.0 EXECUTION

3.1 EXCAVATION AND PREPARATION OF THE FOUNDATION

.1 Excavate the structure foundation to the lines, grades, slopes, and elevations specified in the Contract Documents.

.2 The Owner will identify unsuitable bearing soils when encountered at the earth foundation level. Perform excavation to remove unsuitable bearing soils and replace with fill materials as directed by the Owner.

.3 Compact the base of the excavation to provide a firm foundation of uniform density beneath the entire structure.

.4 Provide care of water to permit the work to be carried out in the dry.

.5 Provide bedding material as specified in the Contract Documents.

3.2 INSTALLATION

.1 Install the precast concrete structure at the locations, and to the lines, grades, slopes, and elevations specified in the Contract Documents. The tolerance from the specified lines, grades, slopes, and elevations is +/-25 mm.

.2 Assemble the precast concrete structures in accordance with the manufacturer's written instructions.

.3 Apply a 25 mm diameter bead of joint sealant between all connecting precast concrete elements to form a watertight joint. Fill all lifting holes or unused bolt holes with non-shrink cementitious grout.

.4 Commence backfilling operations only after the Owner has inspected the installation. Rectify defects, including any identified by the Owner.

.5 Place and compact fill adjacent to the structure as specified in the Contract Documents.

.6 Within 600 mm of the structure, remove stones larger than 80mm from the fill material. Place fill in lifts not exceeding 100 mm in thickness, and compact to the specified density using pneumatic or other mechanical hand tamping equipment.

.7 Compact each lift of fill at the moisture content and to the density specified in Section 02331 – Fill Placement.

.8 Clean the structure of any accumulations of soil and debris.

3.3 REPAIR AND REPLACEMENT OF DAMAGED CONCRETE

.1 Replace any element that suffers structural damage including cracking or other damage, which in the opinion of the Owner, compromises its strength, performance, or durability.

.2 Examine all concrete surfaces and clearly mark out spalled or other areas to be repaired. Obtain the Owner's authorization of the delineated repair areas and the proposed method and equipment to be used for the repairs prior to commencing the work.

.3 Completely remove all damaged concrete down to sound concrete. Remove microfractured surfaces resulting from the initial concrete removal process.

.4 Sawcut the perimeter perpendicular to the surface to a minimum depth of 25 mm. Do not use any repair method that produces a featheredge.

.5 Prior to placing repair mortar, clean and dampen the surfaces to obtain a saturated surface dry condition except where the repair technique requires a dry surface.

.6 Place the polymerized cementitious mortar in accordance with the manufacturer's written instructions. Treat the surface of the concrete to be repaired with a compatible acrylic bonding agent as authorized by the Owner prior to mortar filling.

.7 Construct the repair area slightly proud of the general surface and then grind it to match.

.8 Following repairs, promptly initiate curing, and protection in accordance with CAN/CSA-A23.1.

.9 Provide completed repair areas that are tightly bonded to the underlying concrete and are free of shrinkage cracks or hollow void areas.

3.4 REPAIR OF DAMAGED GALVANIZED COATING

.1 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

.2 Power tool clean surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide metal fabrications in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM A53	Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated Welded and Seamless.
.2	ASTM A108	Specification for Steel Bars, Carbon, Cold Finished, Standard Quality.
.3	ASTM A276	Specification for Stainless Steel Bars and Shapes.
.4	ASTM A307	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
.5	ASTM A320	Specification for Alloys, Steel Bolting Materials for Low-Temperature Service.
.6	ASTM A325M	Specification for High-Strength Bolts for Structural Steel Joints (Metric).

.3 Canadian General Standards Board (CGSB)

.1	CAN/CGSB-1.181	Ready-Mixed Organic Zinc-Rich Coating.

.4 Canadian Standards Association (CSA)

.1	CSA-G40.21	Structural Quality Steel.
.2	CAN/CSA-G164	Hot-Dip Galvanizing of Irregularly Shaped Articles.
.3	CAN/CSA-S16	Limit States Design of Steel Structures.
.4	CSA-W47.1	Certification of Companies for Fusion Welding of Steel Structures.
.5	CSA-W48	Filler Metals and Allied Materials for Metal Arc Welding.
.6	CSA-W59M	Welded Steel Construction (Metal Arc Welding) (Metric Version).

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings at least 20 days prior to fabrication. Indicate material specifications, dimensions, weights, finishes, welds, and other details.

.3 Details of CSA welding certification of the fabricator at least 30 days prior to fabrication.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged materials.

.2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the metal fabrications or shop-applied coatings. Do not store metal fabrications in direct contact with the ground.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Steel:

.1 Steel sections and plates: In accordance with CSA-G40.21, Grade 300W.

.2 Hollow structural sections: In accordance with CSA-G40.21, Grade 350W.

.3 Steel pipe: In accordance with ASTM A53, weight as specified in the Contract Documents.

.4 Welding materials: In accordance with CSA-W59. Welding electrodes: In accordance with CSA-W48. Welding electrodes for structural steel: E480XX.

.5 High strength steel bolts: In accordance with ASTM A325M, galvanized finish.

.6 Steel anchor bolts: In accordance with ASTM A307, galvanized finish.

.7 Stainless steel anchor bolts: In accordance with ASTM A276 Type 304.

.8 Stainless steel fasteners: In accordance with ASTM A320, Grade B8 Class 2 AISI 304, minimum yield strength 690 MPa, 321 HB hardness.

.9 Steel grating: Type 30–102 standard mesh galvanized grating. Size of serrated bearing bars as specified in the Contract Documents.

.10 Steel studs: Nelson Studs in accordance with ASTM A108, minimum yield strength of 345 MPa.

.11 Vehicle Access Control Gates: Galvanized. Size and dimensions as specified in the Contract Documents.

.3 Aluminium:

.1 Ladders: MSU Model 1105 access ladders complete with Model 3104 double rail access handles as manufactured by MSU Mississauga Ltd.

.2 Access hatches: MSU Type M access hatches with padlock recess as manufactured by MSU Mississauga Ltd.

2.2 SHOP FABRICATION OF STEEL COMPONENTS

.1 Employ a fabricator certified by the Canadian Welding Bureau in accordance with CSA-W47.1, Division 3, unless specified otherwise.

.2 Fabricate in accordance with CAN/CSA-S16. Perform welding in accordance with CSA-W59 using welding electrodes in accordance with CSA-W48. Control and minimize distortion, and include stress relief measures to minimize residual stresses.

.3 Do not conduct welding operations when the ambient temperature is below 0°C, or when the base metal temperature is below 0°C. Preheat and maintain the base metal at a minimum temperature of 25°C during welding.

.4 Accurately fabricate metal fabrications true to line and free from warps, twists, bends, and open joints. Reject metal fabrications that have sharp kinks or bends.

.5 Use approved dies or bending rolls for bends. When heating is required, avoid overheating the metal and use cooling methods that do not alter the original properties of the metal.

.6 Do not carry out metal fabrications with welds other than those specified in the Contract Documents unless authorized by the Owner.

.7 Structural steel may be gas-cut in accordance with the applicable portions of CAN/CSA-S16. Do not flame-cut any material without the authorization of the Owner.

.8 Provide bolted connections in accordance with the applicable clauses of CAN/CSA-S16.

.9 Provide holes for fasteners that are not more than 2 mm larger than the nominal diameter of bolts unless otherwise specified in the Contract Documents. Where the thickness of the material is greater than the nominal diameter of the bolt, sub-punch and ream or sub-drill and ream, or drill the holes for the fasteners. Poor matching of holes will be cause for rejection of the item of work.

.10 Hot-dip galvanize metal fabrications, except stainless steel and aluminium items and steel items completely encased in concrete, in accordance with CAN/CSA-G164. Employ measures to minimize distortions due to galvanizing. Locate vent holes so they are not readily visible after the item is installed. Galvanize all items after fabrication, except parts that are bolted together are to be galvanized before final assembly. Galvanize to provide a zinc coating of not less than 610 g/m^2.

3.0 EXECUTION

3.1 GENERAL INSTALLATION

.1 Do not tack weld to aid fabrication or installation without authorization from the Owner.

.2 Perform repairs to welds or base metal by grinding or arc-air gouging followed by grinding. Do not use flame gouging or oxygen gouging.

.3 Shop assemble matching parts of metal fabrications to verify the correctness of fabrication and matching of component parts. If required by the Owner, assemble the component parts at the Site prior to installation.

.4 Accurately align and install metalwork true to the lines, grades, slopes, and elevations specified in the Contract Documents, and obtain proper matching of adjacent surfaces.

3.2 REPAIR OF DAMAGED GALVANIZED COATING

.1 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

.2 Power tool clean surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide medium duty slide gates in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM A36/A36M	Specification for Carbon Structural Steel.
.2	ASTM A48/A48M	Specification for Grey Iron Castings.
.3	ASTM A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
.4	ASTM A126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
.5	ASTM A307	Specification for Carbon Steel Bolts and Studs, Threaded Rod 60000 psi Tensile Strength.
.6	ASTM A325M	Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
.7	ASTM A582	Specification for Free-Machining Stainless Steel Bars.
.8	ASTM B36/B36M	Specification for Brass Plate, Sheet, Strip, and Rolled Bar.
.9	ASTM B584	Specification for Copper Alloy Sand Castings for General Applications.
.10	ASTM F594	Specification for Stainless Steel Nuts.

.3 American Water Works Association (AWWA)

.1	AWWA C560	Cast Metal Slide Gates
.2	AWWA C561	Fabricated Stainless Steel Slide Gates

.4 Canadian General Standards Board (CGSB)

.1	CAN/CGSB 31–GP–3	Corrosion Preventive Compound, Cold Application, Hard Film.
.2	CAN/CGSB-1.181	Ready-Mixed Organic Zinc-Rich Coating.

.5 Canadian Standards Association (CSA)

.1	CSA-G40.21	Structural Quality Steel.
.2	CAN/CSA-G164	Hot-Dip Galvanizing of Irregularly Shaped Articles.

.6 Structural Steel Painting Council (SSPC)

.1 SSPC-SP10 Near White Metal Blast Cleaning.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings and product data at least 30 days prior to fabrication of the products. Indicate on the shop drawings; dimensions and elevations; materials including specifications; details required to fabricate, locate, and install the slide gates including all related fittings and embedded parts; and coatings including specifications.

.3 Manufacturer's supplied documentation for operation and maintenance.

.4 Manufacturer's written instructions for unloading, handling, storing, and installing gates and for repairing damaged coatings prior to performing the Work.

.5 The gate manufacturer's certificate prior to commencing the testing of the slide gates certifying that the installation has been performed according to its recommendations.

1.3 QUALITY CONTROL

.1 Provide the services of the slide gate manufacturer's representative to supervise the installation, testing, and commissioning of the slide gates.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment and timely replace any damaged materials.

.2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the gate or shop-applied coating. Do not store slide gate components in direct contact with the ground.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide slide gates material in accordance with the following.

.2 Medium duty slide gates:

.1 Armtec Waterman SSC-31, Fresno Series 6400 Model 20-10C, or approved equivalent.

.2 Medium duty slide gates with rising gate stems in accordance with AWWA C560 and having components fabricated from the following materials:

Component	Material	Specification
Seat and slide, cross bar, and wedge blocks	Cast iron	ASTM A48/A48M, Class 30 ASTM A126, Class B
Seating face	Aluminum bronze	ASTM B36, C26000
Frame	Galvanized steel	CSA-G40.21, CAN/CSA-G164 ASTM A36/A36M, A123/A123M
Stem	Stainless steel	ASTM A276, Type 304 ASTM A582, Type 303
Fasteners: • bolts • nuts and washers	• Galvanized steel • Stainless steel	• ASTM A307, A325M, A123/A123M • ASTM F594
Lift and stop nuts	Cast zinc aluminum or bronze	Zinc Aluminum ZA–12 or ASTM B584 Alloy 838 or 865 Bronze
Adjustable stem guides, with stem collar and bronze bushing, and wall brackets	Cast iron	ASTM A48/A48M, Class 30 ASTM A126, Class B
Pedestals	Galvanized steel	CSA-G40.21, CAN/CSA-G164 ASTM A36/A36M, A123/A123M

.3 Gate stems: Minimum diameter of 38.1 mm. Stem guides and bronze bushings spaced to limit the slenderness ratio (l/r) of the stem to less than 200.

.4 Manual operator: Square operating nut with T-wrench. Handwheel (cast aluminum), lift housing (cast iron), and pedestal. Incorporate an output shaft extension to permit gate operation using a portable drill unit. Design the operator to permit gate operation with a maximum pull force of 111 N.

.5 Non-rising stem.

.6 Wall thimbles: Type F or E cast-iron thimbles in accordance with ASTM A48/A48M, Class 30 or ASTM A126, Class B.

.7 Hardware: Screws, bolts, and nuts with threads in accordance with the ANSI Unified Thread Standard.

.8 Shop coatings consisting of the following:

.1 Machine finished surfaces: Corrosion preventive compound conforming to CAN/CGSB 31–GP–3.

.2 Exposed cast-iron surfaces except for the gear operator housing, prepared, primed, and painted as follows:

.1 Surface preparation: [Near white metal in accordance with SSPC-SP10].

.2 Coating: [3 coats, Amerlock 400 high solids epoxy paint as manufactured by PPG Protective & Marine Coating. Dry film thickness of 150 to 200 µm per coat. Colour: black.]

.3 Manual gear operator housing: 2 finish coats of blue machine exterior enamel paint.

.4 Galvanizing: Minimum zinc coating of 610 g/m^2.

3.0 EXECUTION

3.1 INSTALLATION AND ASSEMBLY OF SLIDE GATES

.1 Assemble and install the slide gate components in accordance with the manufacturer's written instructions, at the locations, of the sizes, and at the elevations specified.

.2 Locate and install the wall thimbles and gate frames including anchor bolts in their correct orientation, alignment, and plumb position.

.3 Support the gate thimble, anchor bolts, and other parts so that they are not displaced during concrete placement.

.4 Provide a watertight joint between the gate frame and the wall thimble in accordance with the manufacturer's written instructions.

.5 Align the stem and operator with the gate, and install in a plumb position.

.6 After installation, clean, lubricate, and otherwise service the slide gate components in accordance with the manufacturer's written instructions.

3.2 TESTING OF SLIDE GATES

.1 Dry test each slide gate by raising and lowering it with the lift at least 3 cycles throughout its full range of operation after each change or adjustment. Make any required changes or adjustments until the operation of the slide gate, lifts and all appurtenant components are satisfactory to the Owner.

3.3 REPAIR OF DAMAGED COATINGS

.1 Prepare damaged paint surfaces and re-coat with paint in accordance with the paint manufacturer's written instructions.

.2 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

.3 Galvanized surfaces to be repaired shall be cleaned using a power-tool to a bright metal finish. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Provide flap gates in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM A36/A36M	Specification for Carbon Structural Steel.
.2	ASTM A48/A48M	Specification for Grey Iron Castings.
.3	ASTM A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
.4	ASTM A126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
.5	ASTM A307	Specification for Carbon Steel Bolts, Studs and Thread Rod 60000 PSI Tensile Strength.
.6	ASTM F593	Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
.7	ASTM F594	Specification for Stainless Steel Nuts.
.8	ASTM C990	Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

.3 Canadian Standards Association (CSA)

.1	CSA-G40.21	Structural Quality Steel.
.2	CAN/CSA-G164	Hot-Dip Galvanizing of Irregularly Shaped Articles.

.4 Structural Steel Painting Council (SSPC)

.1	SSPC-SP10	Near White Metal Blast Cleaning.

.5 American Association of State Highway and Transportation Officials (AASHTO)

.1	AASHTO M198	Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using, Preformed Flexible Joint Sealants.

.6 U.S Federal Specification

.1	SS-S-210A	Sealing compound, preformed plastic, for expansion joints and pipe joints.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings and product data for the flap gates at least 30 days prior to fabrication. Indicate on the shop drawings dimensions; materials including specifications; details required to fabricate, locate, and install the flap gates, including all related fittings and embedded parts; and coatings, including specifications.

.3 Manufacturer's written instructions for unloading, handling, storing, and installing gates and for repairing damaged coatings prior to performing the work.

.4 Manufacturer's supplied documentations for operation and maintenance.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged materials.

.2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the shop-applied coating. Do not store flap gate components in direct contact with the ground.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Flap Gate Check Valves:

.1 Armtec Waterman SSF-41, Fresno Series 6000 Model 10C, or approved equivalent.

.2 Flap gate's components shall be fabricated from the following materials:

Component	Material	Specification
Frame and cover	Cast iron	ASTM A48, Class 30 ASTM A126, Class B
Seating Faces	Machined cast iron	ASTM A48, Class 30 ASTM A126, Class B
Mounting Gasket	Butyl rubber sealant	SS-S-210A, ASTM C990, AASHTO M-198
Hinge link, link arms	Galvanized steel	CSA-G40.21, CAN/CSA-G164, ASTM A36/A36M, A123/A123M
Assembly Fasteners: • bolts, studs, and anchors • nuts and washers	• Galvanized steel • Stainless steel	• ASTM A307, A123/A123M •ASTM F593, ASTM F594, Type 304

.3 Seating Head: Seating head shall be measured from the water surface to the centre of the gate slide. The gate assembly shall be designed to 3.0 m of seating head.

.4 Gate Seating Faces: Ensure that in the closed position the clearance between the cover and the frame does not exceed 0.1 mm.

.5 Gate Frame: Ensure that the cast iron gate frame has a flat back configuration suitable for attachment to a concrete wall or a round pipe flange, and the self-contained gate consists of a

.6 Mounting gaskets and anchors: Ensure that the gate is mechanically fastened to the mounting surface with anchor bolts or with fasteners.

.7 Shop coating: Paint surfaces of the gate assembly, excluding galvanized, stainless steel and bronze items, as follows:

.1 Surface preparation: Near white metal in accordance with SSPC-SP10.

.2 Coating: 3 coats, Amerlock 400 high-solids epoxy paint as manufactured by PPG Protective & Marine Coating. Dry film thickness of 150 to 200 µm per coat. Colour: black.

.3 Duck Bill Check Valves:

.1 Tideflex Series TF-1 or approved equivalent.

3.0 EXECUTION

3.1 INSTALLATION AND ASSEMBLY

.1 Assemble and install the check valve components in accordance with the manufacturers' written instructions, at the locations, of the sizes, and at the elevations specified in the Contract Documents.

.2 After installation, clean, lubricate, and otherwise service the check valve components in accordance with the manufacturer's written instructions.

.3 Test each check valve at least three times by manually operating it throughout its full range of operation. Make any required changes or adjustments until the operation of flap gate and all appurtenant components are satisfactory to the Owner.

3.2 REPAIR OF DAMAGED COATINGS

.1 Prepare damaged paint surfaces and re-coat with paint in accordance with the paint manufacturer's written instructions.

.2 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

.3 Power tool clean galvanized surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION