



**10th Avenue & 54th Street Utility Upgrades
(CP-2024-42-03)**

CONTRACT DOCUMENTS

Prepared By:

McElhanney Ltd.
201, 13455 114 Ave
Edmonton, AB T5M 2E2

February 5, 2024

CERTIFICATION

These specifications specific to the **10th AVENUE & 54th STREET UTILITY UPGRADES** have been prepared solely for the Town of Edson by McElhanney Ltd. under the direction of a professional engineer registered in the Province of Alberta. There are no beneficiaries of this report, and no other person or entity is entitled to rely upon this report for any purpose whatsoever. It is intended only for the use of the individual, company, government, or other entity for this it was prepared, and for the purposes and within the limitations stated in the report. McElhanney makes no guarantees and disclaims all liability to any third party with respect to any information or opinions set forth herein.

Produced and signed by:



241674 2024-02-06

Jefferey Amundson, P.Eng., McElhanney Ltd.
Project Manager

Section	Pages
DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS	
Section 00 01 10 – Table of Contents	2
Section 00 01 15 – List of Drawings	1
Section 00 11 16 – Tender Invitation	2
Section 00 21 13 – Instructions to Bidders	11
Section 00 41 00 – Tender Form	10
Section 00 43 13 – Bid Bond	1
Section 00 45 15 – Certificate of Insurance	1
Section 00 45 17 – Consent of Surety	1
Section 00 52 00 – Contract Agreement	4
Section 00 61 13.13 – Performance Bond	2
Section 00 61 13.15 – Labour and Material Payment Bond	4
Section 00 72 00 – General Conditions Table of Contents	3
Section 00 72 00 – General Conditions	42
Section 00 72 00 – General Conditions –Schedule A Rules of Arbitral Procedure	7
Section 00 73 00 – Supplementary Conditions	7
DIVISION 01 – GENERAL REQUIREMENTS	
Section 01 11 00 – Summary of the Work	2
Section 01 22 00 – Measurement and Payment	8
Section 01 23 00 – Alternates	1
Section 01 31 19 – Project Meetings	2
Section 01 33 00 – Submittal Procedures	2
Section 01 33 23 – Shop Drawings, Product Data and Samples	2
Section 01 35 26 – Safety Requirements	2
Section 01 41 00 – Regulatory Requirements	1
Section 01 42 13 – Abbreviations and Acronyms	3
Section 01 45 00 – Quality Control	3
Section 01 52 00 – Construction Facilities	7
Section 01 61 00 – Common Product Control	1
Section 01 74 21 – Sitework Demolition and Removal	4
Section 01 74 23 – Final Cleaning	1
Section 01 78 39 – Project Record Documents	1
DIVISION 31 – GENERAL & EARTHWORK	

Section 31 01 00 – Mobilization & Demobilization	1
Section 31 02 00 – Traffic Accommodation	3
Section 31 23 00 – Excavation & Fill	5
Section 31 23 33 – Trenching & Backfilling	9
Section 31 32 19.01 - Geotextiles	1
Section 31 32 19.13 - Geogrid	2
DIVISION 32 – EXTERIOR IMPROVEMENTS	
Section 32 01 00 – Saw cutting of Asphalt Pavement	1
Section 32 04 00 – Concrete Removal	2
DIVISION 33 – UTILITIES	
Section 33 01 30.16 – CCTV Inspection	4
Section 33 05 13.01 – Adjustment of Appurtenances	1
Section 33 05 13 – Manholes and Structures	6
Section 33 31 00 – Sanitary Utility Sewerage Piping	10
DIVISION 34 – TRANSPORTATION	
Section 34 01 00.10 – Proof Rolling	1
Section 34 01 00 – Subgrade Preparation	3
Section 34 01 01 – Concrete for Curbs, Gutters, Walks and Slabs	9
Section 34 01 01.01 – Curbs, Gutters, Walks and Slabs	7
Section 34 01 02 – Formwork for Curbs, Gutters, Walks and Slabs	3
Section 34 01 03 – Reinforcing for Curbs, Gutters, Walks and Slabs	3
Section 34 02 00 – Aggregate	4
Section 34 02 01 – Granular Base	3
Section 34 12 16 – Asphalt Paving	10
Section 34 12 16.10 – Hot-Mix Asphalt Concrete	7
Section 34 17 23.13 – Painted Pavement Markings	4
Section 34 18 00 – Fillcrete	2
DIVISION 37 – LANDSCAPE STANDARDS	
Section 37 91 19 – Landscape Grading	4
Section 37 94 00 – Tree Protection	3
APPENDIX A: ENGINEERING DRAWINGS	
APPENDIX B: GEOTECHNICAL REPORT	
APPENDIX C: ALBERTA TRANSPORTATION PERMIT	

10th Avenue Utility Upgrades

Drawing Number	Drawing Title
C000	COVER PAGE
C001	LEGEND AND NOTES
C100	EXISTING SITE PLAN
C101	REMOVALS PLAN
C102	UTILITIES PLAN
C103	ROAD AND SIDEWALK PLAN
C200	PLAN AND PROFILE, STA 1+000 TO 1+280
C201	PLAN AND PROFILE, STA 1+280 TO 1+520
0300	DETAILS

54th Street Utility Upgrades

Drawing Number	Drawing Title
C000	COVER PAGE
C001	LEGEND AND NOTES
C100	EXISTING SITE PLAN
C101	REMOVALS PLAN
C102	UTILITIES PLAN
C103	ROAD AND SIDEWALK PLAN
C200	PLAN AND PROFILE, STA 2+000 TO 2+290
C201	PLAN AND PROFILE, STA 2+290 TO 2+580
C202	PLAN AND PROFILE, STA 2+580 TO 2+900
0300	DETAILS

- END OF SECTION 00 01 15 -



10TH AVENUE & 54TH STREET UTILITY UPGRADES

This Invitation to Tender (the "ITT") is an invitation by the Town of Edson ("the Town") to prospective bidders to submit bids for **10TH AVENUE & 54TH STREET UTILITY UPGRADES**.

Tenders will be received up to

Sealed Tender, clearly marked as to content, shall be delivered or mailed to:

Town of Edson
Re: Town of Edson
10th Avenue & 54th Street Utility Upgrades
Attention: Armia Mikhael, Infrastructure Manager
605 – 50th Street
PO Box 6300
Edson, AB T7E 1T7

Tenders will be received by Town of Edson up to **14:00:00 hours local time on February 29, 2024** (Bid Closing Time), for the **10TH AVENUE & 54TH STREET UTILITY UPGRADES** project. The time will be conclusively determined using National Research Council of Canada Web clock. ***Submissions received after the date and time noted will not receive a response.***

The results will not be released until a Contract has been awarded by the Town.

Starting **Tuesday, February 6, 2024**, Tender Documents, Drawings and Addenda (if applicable) may be downloaded from Alberta Purchasing Connection (APC) and from the Town of Edson website. Please be aware that it is the Bidder's responsibility to obtain all addenda from the websites if the original contract documents are obtained from either APC, or the Town of Edson website.

Inquiries regarding the Tender Document and/or Drawings shall be directed **by email only** to:

Armia Mikhael, BSc.Eng.
Infrastructure Manager
Town of Edson
Email: armiam@edson.ca

All enquiries will be received up to **11:00am local time Thursday, February 22, 2024**, with a final addendum (if required) posted by February 23, 2024. ***Enquiries received after the date and time noted will not receive a response.***

A **pre-tender meeting** is scheduled for **Tuesday February 13, 2024 at 2:00 pm** local time, in the Town of Edson Town Office at 605 – 50 Street, Edson, AB T7E 1T7. The meeting is not mandatory. Representatives from the Owner and Engineer will be in attendance and a brief site visit may follow. Information relevant to the Bid Documents will be recorded in an Addendum. At minimum proponents are encouraged to visit the project site and surrounding area before submitting a bid.

A bid bond or certified cheque for the amount of ten percent (10%) of the Tender Price is to accompany each Tender. Submission of a Tender by the Bidder gives the Town the right to require the Bidder to execute the Contract and to perform the Work as set out within the Tender Documents. Tenders may not be withdrawn at or after the Tender submittal deadline and will be irrevocable and open for acceptance by the Town for a period of sixty (60) days following the Tender submittal deadline.

The bidder acknowledges and will be willing to accept the role of Prime Contractor pursuant to the Occupational Health and Safety Act requirements and by submission of a bid acknowledges that it has the capability of fulfilling this requirement.

The Town reserves the right in its sole discretion to accept or reject any or all bids and to waive defects, irregularities, mistakes or informalities in any Bid.

Contractor submissions will be evaluated in accordance with Article 20.0 – Tender Review and Evaluation of Section 00 21 13 – Instructions to Bidders. The Town may consider any factor other than price including references, past experience and capability to perform the work.

It is the responsibility of the bidder to have received all Addenda that are issued. Bidders should check the bidding system prior to submitting their bid and up until the Submission Deadline in the event additional addenda are issued.

The bidder accepts complete liability for ensuring the completeness of their bid until the Submission Deadline. The Town will not be responsible for the withdrawal of a bid due to the failure to acknowledge any addenda issued prior to the Submission Deadline.

Bidders may amend their bids prior to the Submission Deadline. The bidder is solely responsible for ensuring that the amended bid is received by the bidding system by the Submission Deadline.

Bidders may withdraw their bids prior to the Submission Deadline by submitting a written notification to the Town, signed by an authorized representative of the bidder, at any time prior to the Bid Closing Time. The Town is under no obligation to return withdrawn bids.

In addition to directions contained in Section 00 11 16 – Tender Invitation, the following Articles govern the tenders received:

1.0 Definitions

In addition to the definitions provided in Article 1.1 of Section 00 72 00 – General Conditions, definitions for the Instructions to Bidders are as follows:

- .1 “Addendum” refers to a written communication issued by the Town or the Town’s designated representative during the Tender Period informing Bidders of changes or clarifications to the Tender Documents. “Addenda” is the plural form of Addendum.
- .2 “Bidder” means an individual, partnership, or corporation that provides a Tender in response to the Town’s Tender Invitation.
- .3 “Tender” means the bid submitted by the Bidder.
- .4 “Tender Documents” include all documents, listed as follows, that form an integral part of the Tender:
 - Tender Invitation
 - Instructions to Bidders
 - Tender Form
 - Contract Agreement
 - Bond and Insurance Forms
 - General Conditions
 - Supplementary Conditions
 - Technical Specifications
 - Special Provisions
 - Drawings and Plans
 - Yellowhead County – Development Standards (where applicable)
 - Alberta Transportation - General Specifications and Specification Amendments for Highway and Bridge Construction – Edition 16, 2019 (GCS) (where applicable)
 - Alberta Transportation - Standard Specifications for Highway Construction – Edition 16, 2019 (HCS) (where applicable)
 - Appendices
 - Addenda (if applicable)
- .5 “Tender Period” means the period of time from the date and time that Tender Documents are available for pickup until the date and time of the Tender submittal deadline.
- .6 “Tender Price” means the Total Tender Price submitted by the Bidder in the Tender Form excluding applicable federal Goods and Services Tax (G.S.T.).

2.0 Preparation of Tender

It shall be the responsibility of the Bidder to ascertain that a full and complete set of said Tender Documents has been obtained.

The Tender shall be made on the supplied Tender Form.

3.0 Interpretation of Estimated Quantities

General directions and descriptions of the Work given in the Technical Specifications are not necessarily repeated in the Schedule of Quantities and Prices and reference to the Technical Specifications should be made for this information.

The rates and prices to be inserted in the Schedule of Quantities and Prices are to be the full inclusive value of the work described under the several items, including all costs and expenses which may be required in and for the execution of the work described, together with all risks, liabilities and obligations set forth or implied in the Tender Documents. Items against which no price is entered are deemed to be covered in other rates or prices in the Schedule of Quantities and Prices.

The quantities shown on the Tender Form are to be considered approximate only and are intended to provide a basis for comparison of the Tenders. Payment to the Contractor will be made only for the actual measured pay quantities of work performed or materials furnished in accordance with the Contract. The scheduled quantities of work to be done and materials to be furnished may each be increased or decreased. Such increase or decrease, regardless of the extent of the increase or decrease, shall not, in any way, invalidate the unit prices tendered.

The Town reserves the right to award the contract in whole or in parts at its sole discretion.

4.0 Site Conditions

In preparation of a Tender, the Bidder must examine the site of the Work, either personally or through a representative, and be satisfied as to the nature and location of the Work, all conditions, soil structure and topography at the site of the Work, the nature and quality and quantity of the materials to be used, the equipment and facilities needed preliminary to and during the prosecution of the Work, the means of access to the site, on-site accommodation, all necessary information as to risks, contingencies and circumstances as may affect the Bid, and all other matters which can, in any way, affect the Work under the Contract. The Bidder is fully responsible for obtaining all information required for preparation of the Tender and for the execution of the Work.

In submitting a Tender, the Bidder accepts all environmental risks and conditions, all legal requirements applicable to the Work, all labour conditions, including productivity, availability and qualifications, and all conditions affecting safety.

The Bidder is not entitled to rely on any data or information included in the Tender Documents as to site or subsurface conditions or test results indicating the suitability, quantity or otherwise of site or subsurface materials for any use in carrying out the construction of the Work, including backfilling.

If the Bidder requires additional time to conduct independent investigations or is of the opinion either that the site or subsurface conditions or that the site or subsurface materials differ materially from that indicated by data or information included in the Tender Documents, the Bidder shall promptly request such additional time or notify the Town, in writing, of the Bidder's opinion before the time of Tender submission. The Town may, at its sole discretion, either extend the time for submission of Tenders to enable

Bidders to carry out further investigation or issue an addendum modifying the Tender Documents or both as the circumstances may permit.

5.0 Subdivision of Work

The Bidder shall note that the Drawings and specific articles of the Technical Specifications may have been arranged into various sections or subdivisions to better describe the Work to be carried out under this Contract. The Contractor to be named in the Agreement shall be solely responsible for all work under the Contract and for the allocation of work to subcontractors when necessary.

The Contractor shall be responsible for the administration and subdivision of the Work to subcontractors, and all disputes as to scope of the Work to be carried out by various subcontractors shall be resolved by the Contractor so that all work is carried out in accordance with the Contract Documents. No claims for extras will be allowed on the basis that the subcontractors did not include same in their scope of work due to any subdivisions of work expressed or implied in the Drawings or Technical Specifications.

6.0 Alternative Materials – Owner Requested

Where called for, the Bidder must submit prices for all alternatives shown in the places provided in the Tender Form. The Tender Price shall be the extension of the lesser of the alternate prices, but the Town reserves the right to award the Contract on the basis of any alternative shown.

7.0 Omissions or Discrepancies

It is the responsibility of the Bidder to carefully examine the Tender Documents. Any errors, omissions, discrepancies, or articles requiring clarification must be reported to the Town in writing at least ten (10) days prior to the date of the Tender submission deadline.

No changes or modifications to the Tender Documents shall be valid unless such changes or modifications are issued by the Town in writing.

The Town also reserves the right to amend or revise the Tender Documents prior to the date of the Tender submission deadline. Bidders will be informed of all such changes through addenda. Any addenda issued with respect to the Tender shall form part of the Tender Documents and shall be included in the Tender Price.

It is the sole responsibility of the Bidder to ensure all suppliers and subcontractors are provided with all information from the Tender Documents regarding their subdivision of the Work.

8.0 Electronic Documents

Tender Documents can be obtained as outlined in the Tender Invitation.

9.0 Supporting Documentation

Upon Tender award the successful Bidder may be requested to provide the following documentation within 10 days;

- a) Evidence demonstrating the Bidder's applicable past experience in projects related to the Work, and evidence that the Bidder is prepared to use the

necessary personnel and equipment to carry out the Work satisfactorily and within the time stated in the Tender Form.

- b) Indicate the manufacturer or product brand name of the items listed together with the name of the supplier or distributor from which each item will be purchased. Where more than one supplier or manufacturer is listed or specified, the name of the selected supplier or manufacturer shall be inserted. After the Contract is awarded, manufacturers and suppliers shall not be changed from those shown in the Tender Form without the written authorization of the Town.
- c) Equipment intended for use in the Work. The equipment listed must be used unless otherwise authorized by the Town. The words "As Required", or similar wording will not be sufficient to describe the equipment. The Tender must be accompanied by a rate table detailing hourly rates for the equipment the Bidder proposes to use in the performance of the Work.
- d) Names of all subcontractors proposed for the Work. The subcontractors may not be changed without the written consent of the Town. The Town may require the Bidder to submit evidence of the competence and experience of proposed subcontractors prior to acceptance of the project.
- e) A rate table detailing regular and overtime hourly labour rates for the Bidder's proposed work force.

10.0 Date for Commencement and Completion

The Bidder shall state, in the Completion Methodology section and Work Plan, the proposed start date for the Work, milestone dates for project component completion, and the duration and date anticipated for project completion. There will be no damages for delay assessed for days lost due to inclement weather or conditions resulting from inclement weather, that occur after the specified or adjusted completion date.

The Contractor shall commence the Work in accordance with the time limits set out in the Contract or on a date acceptable to the Town and confirmed in writing between the Contractor and the Town.

The Contractor shall commence the Work and proceed with diligence to prosecute the Work in accordance with the agreed upon schedule in sufficient time to complete the Work on or before the completion date specified in the Contract.

The project shall be substantially completed as follows:

Project Start Date: start as early as May 1, 2024, but no later than May 20, 2024

Substantial Completion: no later than July 19, 2024

Construction Completion: no later than August 5, 2024

11.0 Alternate or Equal – Bidder Supplied

Where the Technical Specifications or Drawings stipulate that a particular kind or make of material or equipment shall be used, and allow for an equal or alternate material or equipment to be substituted, any proposed substitution must be submitted in writing, with sufficient supporting documentation, to the Town for evaluation. No applications for approval of substitutions will be accepted within ten (10) days of the Tender submission deadline. Approvals under this section will be communicated to all Bidders by addenda.

When a request to substitute allegedly equal material or equipment is made to the Town, the Town may approve the substitution either as an equal or an alternate. If an item is approved as equal, the Bidder may use that item in place of the specified item. If the item is approved as an alternate, the Bidder shall base the price upon the specified item and may indicate in the Tender the price which will apply if use of the alternate item is accepted.

In submission of alternatives or equals to items of material mentioned in the Technical Specifications, the Bidder shall, in the Tender, make consideration for any changes required in the Work to accommodate such alternatives or equals. A claim for an addition to the Contract Price because of changes in the Work necessitated by the use of alternatives or equals will not be considered.

12.0 Federal Goods and Services Tax (G.S.T.)

The Bidder shall not include G.S.T. in the tendered unit prices, lump sum prices or in the Tender Price.

13.0 Tenders to be Under Seal

All Tenders shall be signed and sealed. In the case of a body corporate, the Tender shall be under the corporate seal; in the case of an individual person, the Tender shall be under the seal of that person, and in the case of an association of persons or a firm, each member of the association or firm shall affix their seals to the Tender.

The Bidder's legal status must be disclosed, and business address given near signatures in the Tender Form.

14.0 Bid Security

The Tender must be accompanied by a certified cheque, bid bond, or irrevocable letter of credit from a recognized financial institution payable to the Town in the amount of ten percent (10%) of the Tender Price for the Work. If a bid bond is provided, one of the conditions of the bond obligation shall be that the Bidder shall leave the Tender open for acceptance for a period of sixty (60) days from the date of the Tender submission deadline. The Bid Bond template provided in Section 00 43 13 – Bid Bond or the Canadian Construction Documents Committee (CCDC) Form 220 (CCDC 220) shall be the only forms acceptable.

The bid security of the unsuccessful Bidders 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 Town, or at the time the Tenders expire.

15.0 Contract Bonding

The Tender must also be accompanied by a consent of surety agreement by a surety company stating that it is prepared to execute a Performance Bond and Labour and Materials Payment Bond in accordance with Article 11.0 of Section 00 72 00 – General Conditions, or as stipulated in Section 00 73 00 – Supplementary Conditions. A Consent of Surety template is provided in Section 00 45 17 – Consent of Surety.

The Consent of Surety will be required whether the Bidder uses a certified cheque, bid bond, or irrevocable letter of credit from a recognized financial institution under the provisions of Article 14.0 – Bid Security.

In lieu of a consent of surety agreement, the bidder may provide a performance bond and a labor & material payment bond each in the amount of 50% of the contract price in the form provided in Section 00 61 13.13 or CCDC 221.

16.0 Insurance

A Certificate of Insurance certifying that the insurance, as required in Section 00 72 00 – General Conditions, is in place, shall be included with each Tender. The Certificate of Insurance template provided in Section 00 45 15, or similar format clearly indicating the required coverage, shall be the only forms acceptable.

If the required insurance is not in place, a letter from the Bidder's insurance broker certifying that the required insurance will be issued to the Bidder if the said Bidder is the successful Bidder, shall be included with the Tender.

17.0 Withdrawal of Tenders

Permission will be given to a Bidder to withdraw the Tender without prejudice as described in the Tender Invitation.

18.0 Modification of Prices

A Bidder may, without prejudice, modify or correct any unit price on the Tender on or before the submission deadline if the notice of modification or correction complies with the following:

- .1 The notice must be in writing;
- .2 The notice must be hand delivered; electronic and facsimile notices will not be accepted;
- .3 The notice must identify the project;
- .4 The notice must distinctly identify the item in the original Tender that is to be modified or corrected, and shall clearly specify the modification or correction to be made;
- .5 The notice must be signed by a person authorized to execute the Tender as set forth in Article 13.0 – Tender to be Under Seal of these Instructions to Bidders; and
- .6 The notice must be filed at the Town of Edson office, 605 – 50 Street, Edson, AB, T7E 1T7 on or before the date and time of the Tender submission deadline. The notice must be clearly marked as to content with the project name and submitting company name.

19.0 Rejection of Tenders

Tenders that are unsigned, incomplete, conditional, illegible, unbalanced, obscure, or that contain additions not called for, reservations, erasures, alterations, or irregularities of any kind, may be accepted or rejected at the discretion of the Town.

On Unit Price Tenders, if there is a discrepancy found between the unit prices and the total amount, the unit price shall be considered as representing the intention of the Bidder and the Tender Price will be recalculated and incorporated into the Tender.

20.0 Tender Review and Evaluation

.1 Mandatory Criteria – Stage 1 (Pass/Fail)

a) Mandatory requirements will be assessed on a pass/fail basis. Any submissions that have any mandatory criteria assessed as a failure may be disqualified from further evaluation.

b)

Mandatory Criteria	Yes/No	Pass/Fail
Certificate of Insurance		
Acknowledgement of Addenda		
Consent of Surety		
Bid Security		
Copy of Bidders COR/SECOR		
Proof of Worker's Compensation Board (WCB)		
Completed & Authorized Tender Form		

c) The Town Reserves the right to contact any current or previous client, whether referenced or not, to obtain information required regarding the quality of service provision and to use this information in its sole discretion in the evaluation of the submission. The Town Reserves the right to disqualify proponents based on references.

d) Once the mandatory information is confirmed the tender will be evaluated and awarded.

.2 Evaluation Criteria – Stage 2 (100 max points)

a) Bidders who meet all mandatory criteria will be further evaluated on the following desired criteria:

Desired Evaluation Criteria	Weighting Percentage
Contractor Experience and Qualifications	20
Team Member Experience and Qualifications	20
References Related to Past Performance	20
Pricing	40
TOTAL	100
Sub-contractor (if any) Experience	0 (Value Added)

b) The Bidder's response to each requirement will be evaluated by a committee on a scale of 1-5 as outlined in the following table.

Score	Achievement	Criteria
1	No or poor response	Did not respond or is lacking in critical areas and may have a poor chance of success
2	Meets minimum acceptable	Meets some but not all the critical areas and may have a poor chance of success
3	Average	Meets the requirements but does not show more than needed to comply with requirements and may succeed with help
4	Above Average	Above the standard, showed a history of completing projects well above the baseline, has a good chance of being successful
5	Excellent	Exceeds requirements and will add value to the project and is likely to be successful

- c) **Contractor Experience and Qualifications (20/100)** – The Bidder shall also submit a summary of projects of a similar nature recently completed on time and on budget. The Bidder must submit a minimum of 2 projects, and up to a maximum of 5 projects for evaluation. This includes (but not limited to):
- i) Previous experience working on similar projects, including:
 - i. deep utility construction crossing primary highways; and
 - ii. sanitary sewer replacements in urban environments.
 - ii) Previous experience effectively managing internal resources and crews
 - iii) The Bidder shall include the following information for each project provided: Project name and location, year of construction, client name, role on the project, key personnel, construction project value, project description, and relevance to this project.
- d) **Team Qualifications (20/100)** - The Bidder shall submit the names and resumes of key personnel who will be assigned to the project. Information submitted should include staff availability to the project as well as staff experience on at least 2 similar projects at a minimum for the following;
- i) Project Manager (Key Contact)
 - ii) Site Superintendent

- e) **References related to Past Performance (20/100)** – Provide a minimum of 3 current owner references for similar work completed as stated in item c above. Reference information shall include contact name, phone number and email address as well as the project name, value and Bidders role. The Town may include itself and may also contact other known references not provided by the Bidder.
- f) **Pricing (40/100)**
 - i) The Total Price will be the sum of the Total Price in the Schedule of Quantities.
 - ii) Pricing will be scored based on a relative pricing formula using the rates set out in the pricing form. Each proponent will receive a percentage of the total possible points allocated to price, which will be calculated in accordance with the following formula:
$$\text{lowest price} \div \text{proponent's price} \times \text{weighting} = \text{proponent's pricing points}$$
 - iii) *lowest price ÷ proponent's price × weighting = proponent's pricing points*
 - iv) Points will be deducted if force account rates are higher than the Alberta Road Builders published rates.
- g) These evaluation criteria are for internal purposes only and do not obligate the Town to accept the best evaluated Submission.

21.0 Tenders Exceeding Budget

- .1 If the lowest compliant Tender provides a Tender Price that exceeds the amount the Town has budgeted for the Work, the Town may reject all Tenders.
- .2 If the lowest compliant Tender provides a Tender Price that exceeds the amount the Town has budgeted for the Work, the Town retains the right to proceed as follows:
 - a) Cancel the Tender, and
 - b) Cancel the Project; or
 - c) Retender the Project with a revised scope, or
 - d) Enter into negotiations with the vendor that submitted the “lowest compliant Tender”.
- .3 If the Town elects to negotiate with the vendor that submitted the “lowest compliant Tender”:
 - a) All statements made by the Town and the Bidder in the course of negotiations are without prejudice and confidential;
 - b) The Town will not attempt to obtain a lower price for the same work but may attempt to obtain a lower price for an altered scope of work. In no event will the Town be obliged to disclose the amount budgeted for the work.

- .4 If the Town is unable to reach an agreement with the vendor that submitted the "lowest complaint" Tender" then the Town retains the right to:
 - a) Cancel the Tender, and
 - b) Cancel the Project, or
 - c) Retender the Project with a revised scope, or
 - d) Enter into negotiations with any vendor
- .5 Under no circumstances shall the Town be obligated to award the Contract for either the original or the lower negotiated price.

22.0 Acceptance of a Tender

Acceptance of a Tender will be by notice in writing signed by Town officials, and no other act of the Town shall constitute the acceptance of a Tender. This notice will be given as soon as possible following the Tender Period closing and, unless otherwise specified, no later than sixty (60) days following the Tender Period closing. Acceptance of a Tender shall bind the successful Bidder to execute the Contract and be bound by all the provisions of the Contract Documents.

23.0 Certificate of Recognition (C.O.R.) Safety Program

A copy of the successful Bidder's C.O.R. or a copy of the Bidder's name and certificate number on either the Government of Alberta Employment and Immigration's certification list or other applicable organizations certification list, current at the time of Tender closing, shall be submitted to the Town within 5 days of tender closing.

A Bidder may submit a valid Temporary Letter of Certification (TLC) issued by the Alberta Construction Safety Association or other applicable organization.

24.0 Contract Execution and Commencement of Work

The successful Bidder, whose Tender is accepted, will be required to execute the Contract Agreement within five (5) days after notice that the Contract has been awarded. Failure or negligence to do so shall constitute a breach of the Agreement affected by the acceptance of the Tender.

The Contractor shall commence work on the project within five (5) days of a "Notice to Proceed", unless other arrangements have been approved by the Town in writing.

25.0 Workers' Compensation

- .1 Within 10 days of the successful contract award the Bidder is to submit a letter of Account from the Workers' Compensation Board (WCB) – Alberta, including the Bidder's WCB rates and frequency of lost time incidents (LTIs) for the past two years (Frequency of LTIs = Number of LTIs x 200,000 / Total Annual Employee Hours).
- .2 Bidders who do not have an account with the Workers' Compensation Board – Alberta shall provide evidence of a subcontractor or other company that will carry such coverage on their behalf.

- .3 If the Bidder is performing work in an exempt industry as defined under the Workers' Compensation Act - Alberta and does not carry coverage, the Bidder acknowledges that the Town is subject to a deeming order under the Workers' Compensation Act - Alberta.

- END OF SECTION 00 21 13 -

Date: _____

Bidder: _____

Street Address: _____

City: _____ Province: _____ Postal Code: _____

Representative: _____ Phone Number: _____

Fax Number: _____ Email Address: _____

For: _____

G.S.T. Registration Number: _____

TO: Town of Edson
605 – 50 Street
Edson, AB T7E 1T7

1.0 Tender Summary

Schedule "A" TENDER PRICE (excluding G.S.T.)\$ _____

Schedule "B" TENDER PRICE (excluding G.S.T.)\$ _____

Schedule "C" TENDER PRICE (excluding G.S.T.)\$ _____

2.0 The Bidder submits the following with the Tender:

- .1 Completed and Authorized Tender Form for Schedules "A", "B" and "C".
- .2 Bid Security equal to ten percent (10%) of the Tender Price in the form of:
 - a) A certified cheque, or;
 - b) A Bid Bond in the form provided in Section 00 43 13 or CCDC 220, or;
 - c) An irrevocable letter of credit from a recognized financial institution.
- .3 Certificate of Insurance (or verification of same as per Section 00 21 13, Article 16.0) in the form provided in Section 00 45 15.
- .4 Consent of Surety in the form provided in Section 00 45 17. In lieu of a consent of surety agreement, the bidder may provide a performance bond and a labor & materials payment bond each in the amount of 50% of the contract price in the form provided in Section 00 61 13.13 or CCDC 221.
- .5 **All tenders submitted without the required documentation as specified in the above items 2.1 to 2.4 inclusive shall be considered non-compliant and will be rejected.**

Incomplete tenders will not be accepted.

3.0 The Bidder hereby acknowledges receipt of the following addenda:

Addendum No.	No. of Pages	Dated

4.0 The Bidder understands that if selected as the successful Bidder for this Tender, the Town shall provide written notice to the Bidder to the address provided by the Bidder in this Tender Form.

5.0 If selected as the successful Bidder, the Bidder shall:

- .1 Execute the Contract within five (5) days of receipt of the Contract from the Town and return the Contract to the Town.
- .2 If the Bidder fails or declines to execute the Contract, the Bid Security shall be forfeited to the Town as compensation for damages that the Town may suffer by reason of the Bidder's failure to execute the Contract. The Bidder acknowledges that the forfeiture of the Bid Security shall not limit or restrict the Town's right to recover from the Bidder damages suffered in excess of the amount of the Bid Security.
- .3 Provide all requested information as specified in section 00-21-13 Instructions to bidder within 10 days of contact award.

6.0 The Bidder hereby represents to the Town that the Bidder:

- .1 Has carefully examined the Tender Documents.
- .2 Has carefully examined the site of the Work and accepts the provisions of Article 4.0 of the Section 00 21 13 – Instructions to Bidders.
- .3 Have the resources, skills and ability to perform the Work in accordance with the Contract.

7.0 The Bidder understands and agrees that:

- .1 The Town reserves the right to increase, decrease, delete or vary any portion of the Work, and the Bidder agrees to comply with any such change in the Work subject to valuation and adjustment as provided in the Contract.
- .2 The quantities, if any, listed by the Town in the schedule herein are approximate only and are for the purpose of comparing Tenders. In arriving at the Unit Prices set forth in this Tender form, the Bidder has made his own estimates of the respective quantities involved and has not relied upon the estimates shown in the Schedule of Quantities and Prices. The Bidder shall have no claim for any loss of anticipated profits or other costs, extras or losses resulting from any excess or

-
- deficiency in the quantities shown, regardless of the extent of any excess or deficiency.
- .3 Payment under the Contract will be made on the basis of completed work, or portions thereof, measured and accepted by the Town and valued at the applicable unit prices, or applicable lump sum prices or portions thereof.
- .4 The Town may order extra work not covered by the Schedule of Quantities and Prices. Compensation for extra work will be determined in accordance with the General Conditions.
- .5 Where a Contingency Allowance is included in the Schedule of Quantities and Prices, only actual expenditures for such items as extra work, changes in the work, unclassified work, or others, made upon the written authority of the Town, will be paid out of such allowance, and that the Contract Price will be changed in the amount by which the Contingency Allowance either exceeds or is exceeded by such expenditures.
- 8.0 The Bidder declares that with respect to federal commodity tax instructions, the Tender Documents have been duly observed and adhered to; the goods and services tax status of the goods involved has been properly determined; and all rates and entitlements provided for in the relevant tax statutes as affecting the Town have been duly considered.
- 9.0 The Bidder represents and warrants to the Town that the several declarations and matters stated in this Tender Form and this Bid are true and binding in all respects, and that this Bid has been compiled by the Bidder with full knowledge and understanding of all matters and things called for insofar as they relate to the Tender Documents.
- 10.0 The Bidder acknowledges that payment for work performed under the Contract shall be on the basis of a lump sum price OR unit prices.
- 11.0 The Bidder is prepared to begin work on the date specified in the Completion Schedule and to prosecute the Work in such a manner as to achieve completion as indicated, including all clean up and rectification of all deficiencies, also in accordance with the Completion Schedule. The Bidder understands that time is of the essence for completion of the Work. Should the undersigned fail to complete the Work within the specified calendar days plus any extension of time granted by the Town for additional work done, then the undersigned shall be required to pay liquidated damages to the Town. Such damages shall cover all additional Engineering costs and expenses, Town overhead costs, and any other applicable costs that may be incurred by the Town as a result of each delay.
- 12.0 That no person, firm or corporation other than the Bidder has any interest in this Tender or in the proposed Contract for which this Tender is made and to which it relates.
- 13.0 That this Tender is made by the Bidder without any connection, knowledge, comparison of figures or arrangement with any other person or persons making a Tender for the same Contract, and is in all respects fair and without collusion or fraud.

14.0 Unless and until the formal agreement is prepared and executed, it is understood that this Tender together with the Notice of Acceptance shall constitute a binding Contract between the Town and the successful Bidder.

15.0 Schedule of Force Account Rates

The following personnel and equipment rates will form the basis of payment for force account work carried out in accordance with the General Conditions. The rates show are all inclusive. Contractor overhead and profit and, where applicable, subcontractor overhead and profit, are included in the rates. (Add additional pages, if necessary).

.1 Personnel

Line Item	Personnel – List by Occupation	Hourly Rate	Overtime Rate

.2 Equipment (Including Operator)

Line Item	Equipment	Hourly Rate	Overtime Rate

16.0 Schedule of Quantities and Prices

The Bidder agrees that the Tender Price includes all items as outlined in the Technical Specifications or Drawings or otherwise required to complete the Work, but is not necessarily limited to the following items. The following cost breakdowns Schedules A & B shall be used in evaluation of bids and for future progress payment purposes. All payments will be made as per Section 01 22 00 – Measurement & Payment and will include all work outlined in the related specification sections as identified in the Measurement & Payment clause.

The Bidder shall provide pricing for both **10 Avenue – 56 Street to 52 Street Sanitary Upgrade** and **54 Street – 5 Avenue to 1 Avenue Sanitary Upgrade**, as defined on the Tender Drawings.

Schedule "A"
10 Avenue – 56 Street to 52 Street Sanitary Upgrade
Schedule of Quantities

Item	Description	Unit	Unit Price	Quantity	Extension
CONSTRUCTION COSTS					
Section 1: General					
1.1	Mobilization & Demobilization (assumes 7%)	LS	\$ _____	1	\$ _____
1.2	Traffic Accommodation (assumes 5%)	LS	\$ _____	1	\$ _____
Total Section 1: General					
Section 2: Surface Removals					
2.1	Asphalt Removal				
	.1 Remove and Dispose Existing Road Structure to Design Subgrade	m ²	\$ _____	1,705	\$ _____
2.2	Remove & Dispose Existing Concrete				
	.1 Curb & Gutter	lm	\$ _____	205	\$ _____
	.2 Sidewalk	m ²	\$ _____	205	\$ _____
Total Section 2: Surface Removals					
Section 3: Roadways & Excavation					
3.1	Top Lift Asphalt Concrete Pavement - Supply and Install (50mm Depth)	m ²	\$ _____	1,705	\$ _____
3.1	Bottom Lift Asphalt Concrete Pavement - Supply and Install (50mm Depth)	m ²	\$ _____	1,705	\$ _____
3.2	Supply and Install Granular Base Course (Des 2, Class 20) (150mm Depth)	m ²	\$ _____	1,705	\$ _____
3.3	Supply and Install Granular Sub-Base (300mm Depth)	m ²	\$ _____	1,705	\$ _____
3.4	Subgrade Preparation - 150 mm Depth	m ²	\$ _____	1,705	\$ _____
3.5	Geogrid (Biaxial)	m ²	\$ _____	1,705	\$ _____
3.6	Non-Woven Geotextile	m ²	\$ _____	1,705	\$ _____
Total Section 3: Roadways & Excavation					
Section 4: Concrete					
4.1	Standard 1.5m Wide Sidewalk	m ²	\$ _____	230	\$ _____
4.2	Rolled Face Concrete Curb & Gutter (250mm Gutter) - Supply & Install	lm	\$ _____	205	\$ _____
Total Section 4: Concrete					
Section 5: Sanitary Sewer					
5.1	Sanitary Sewer Main				
	.1 Remove and Replace Existing				
	.1 Replace with 375mm Dia. PVC DR35 MH S340 - MH S337	lm	\$ _____	265	\$ _____
	.2 Replace with 375mm Dia. PVC DR35 MH S249 - MH S340	lm	\$ _____	150	\$ _____
5.2	Over-Excavation (incl. Installation of Washed Rock) (Provisional)	m ²	\$ _____	104	\$ _____
5.3	Sanitary Manholes				
	.1 Remove and Replace Existing Manholes w/ New 1200 mm I.D. Barrel	v.m	\$ _____	21	\$ _____
5.4	Supply and Install New Frame and Cover				
	.1 NF 80 Frame & Cover	ea	\$ _____	9	\$ _____
5.5	Connection to existing sanitary mains	ea	\$ _____	4	\$ _____
5.6	Locate, Remove and Replace Existing Sanitary Services with New 100 mm Diameter PVC DR 28 Sanitary Services c/w Connections to Property Line (PROVISIONAL)	ea	\$ _____	19	\$ _____
5.7	Locate, Remove and Replace Existing Sanitary Services with New 150 mm Diameter PVC DR 28 Sanitary Services c/w Connections to Property Line (PROVISIONAL - MULTIFAMILY UNITS FROM 1+010 - 1+190)	ea	\$ _____	4	\$ _____
5.8	Bypass Pumping	LS	\$ _____	1	\$ _____
5.9	CCTV Sewer Inspection				
	.1 Construction Completion	lm	\$ _____	415	\$ _____
	.2 End of Warranty Period	lm	\$ _____	415	\$ _____
5.10	Temporary Water Supply	LS	\$ _____	1	\$ _____
Total Section 5: Sanitary Sewer					
CONSTRUCTION SUBTOTAL - SCHEDULE "A"					\$ _____

Note:

- The intent of the Contract is that excavated native backfill shall be reused as approved by the Engineer.
- Maintain existing sanitary, water and storm services at all times during the execution of the Work. Service interruptions and/or damage are the responsibility of the Contractor at no cost to the Owner.
- Construction Limits are as defined on drawings.
- The Bidder shall complete and submit pricing for the entire scope of work included in Schedules "A", "B", and "C".
- Temporary water and sanitary servicing to businesses and residences is to be included in Unit Costs provided.

UNIT PRICES

All unit prices include the cost of supply of new material and labour to install unless noted otherwise.

Schedule "B"
54 Street – 5 Avenue to 1 Avenue Sanitary Upgrade
Schedule of Quantities

Item	Description	Unit	Unit Price	Quantity	Extension
CONSTRUCTION COSTS					
Section 1: General					
1.1	Mobilization & Demobilization (assumes 7%)	LS	\$	1	\$
1.2	Traffic Accommodation (assumes 5%)	LS	\$	1	\$
Total Section 1: General					
Section 2: Surface Removals					
2.1	Asphalt Removal				
	.1 Remove and Dispose Existing Road Structure to Design Subgrade	m ²	\$	1,245	\$
2.2	Remove & Dispose Existing Concrete				
	.1 Curb & Gutter	lm	\$	40	\$
Total Section 2: Surface Removals					
Section 3: Roadways					
3.1	Top Lift Asphalt Concrete Pavement - Supply and Install (60mm Depth)	m ²	\$	1,245	\$
3.2	Bottom Lift Asphalt Concrete Pavement - Supply and Install (60mm Depth)	m ²	\$	1,245	\$
3.3	Supply and Install Granular Base Course (Des 2, Class 20) (150mm Depth)	m ²	\$	1,245	\$
3.4	Supply and Install Granular Sub-Base (300mm Depth)	m ²	\$	1,245	\$
3.5	Subgrade preparation - 150 mm Depth	m ²	\$	1,245	\$
3.6	Geogrid (Biaxial)	m ²	\$	1,245	\$
3.7	Non-Woven Geotextile	m ²	\$	1,245	\$
Total Section 3: Roadways					
Section 4: Concrete					
4.1	Standard Concrete Curb & Gutter (250mm Gutter) - Supply & Install	lm	\$	40	\$
Total Section 4: Concrete					
Section 5: Sanitary Sewer					
5.1	Sanitary Sewer Main				
	.1 Remove and Replace Existing				
	.1 Replace with 300mm Dia. PVC DR35	lm	\$	7	\$
	.2 Replace with 450mm Dia. PVC DR35	lm	\$	470	\$
	.3 Replace with 600mm Dia. Concrete	lm	\$	333	\$
5.2	Over-Excavation (incl. Installation of Washed Rock) (Provisional)	m ²	\$	203	\$
5.3	Sanitary Manholes				
	.1 Remove and Replace Existing Manholes w/ New 1200 mm I.D. Barrel	v.m	\$	30	\$
	.2 Remove and Replace Existing Manholes w/ New 1500 mm I.D. Barrel	v.m	\$	3	\$
	.3 Supply and Install New Manhole 1200mm I.D. Barrell	v.m	\$	8	\$
	.4 Remove and Dispose Existing Manholes	ea	\$	1	\$
5.4	Supply and Install New Frame and Cover				
	.1 NF 80 Frame & Cover	ea	\$	13	\$
5.5	Connection to existing sanitary mains	ea	\$	2	\$
5.6	CCTV Sewer Inspection				
	.1 Construction Completion	lm	\$	810	\$
	.2 End of Warranty Period	lm	\$	810	\$
5.7	Fillcrete Backfill	lm	\$	34	\$
5.8	Bypass Pumping	LS	\$	1	\$
Total Section 5: Sanitary Sewer					
Section 6: Landscape					
6.1	Landscaping Restoration	m ²	\$	790	\$
6.2	Supply and Install Fence	lm	\$	8	\$
Total Section 6: Landscape					
CONSTRUCTION SUBTOTAL - SCHEDULE "B"					\$ _____

Note:

- The intent of the Contract is that excavated native backfill shall be reused as approved by the Engineer
- Maintain existing sanitary, water and storm services at all times during the execution of the Work. Service interruptions and/or damage are the responsibility of the Contractor at no cost to the Owner.
- Construction Limits are as defined on drawings.
- The Bidder shall complete and submit pricing for the entire scope of work included in Schedules "A", "B", and "C".
- Temporary water and sanitary servicing to businesses and residences is to be included in Unit Costs provided.

UNIT PRICES

All unit prices include the cost of supply of new material and labour to install unless noted otherwise.

Schedule "C"
10 Avenue – 56 Street to 52 Street Sanitary Upgrade
Schedule of Quantities

Item	Description	Unit	Unit Price	Quantity	Extension
CONSTRUCTION COSTS					
Section 1: General					
1.1	Mobilization & Demobilization (assumes 7%)	LS	\$ _____	1	\$ _____
1.2	Traffic Accommodation (assumes 5%)	LS	\$ _____	1	\$ _____
Total Section 1: General					
Section 2: Surface Removals					
2.1	Asphalt Removal				
	.1 Remove and Dispose Existing Road Structure to Design Subgrade	m ²	\$ _____	1,705	\$ _____
2.2	Remove & Dispose Existing Concrete				
	.1 Curb & Gutter	lm	\$ _____	205	\$ _____
	.2 Sidewalk	m ²	\$ _____	205	\$ _____
Total Section 2: Surface Removals					
Section 3: Roadways & Excavation					
3.1	Top Lift Asphalt Concrete Pavement - Supply and Install (50mm Depth)	m ²	\$ _____	1,705	\$ _____
3.1	Bottom Lift Asphalt Concrete Pavement - Supply and Install (50mm Depth)	m ²	\$ _____	1,705	\$ _____
3.2	Supply and Install Granular Base Course (Des 2, Class 20) (150mm Depth)	m ²	\$ _____	1,705	\$ _____
3.3	Supply and Install Granular Sub-Base (300mm Depth)	m ²	\$ _____	1,705	\$ _____
3.4	Subgrade Preparation - 150 mm Depth	m ²	\$ _____	1,705	\$ _____
3.5	Geogrid (Biaxial)	m ²	\$ _____	1,705	\$ _____
3.6	Non-Woven Geotextile	m ²	\$ _____	1,705	\$ _____
Total Section 3: Roadways & Excavation					
Section 4: Concrete					
4.1	Standard 1.5m Wide Sidewalk	m ²	\$ _____	230	\$ _____
4.2	Rolled Face Concrete Curb & Gutter (250mm Gutter) - Supply & Install	lm	\$ _____	205	\$ _____
Total Section 4: Concrete					
Section 5: Sanitary Sewer					
5.1	Sanitary Sewer Main				
	.1 Remove and Replace Existing				
	.1 Replace with 375mm Dia. PVC DR35 MH S340 - MH S337	lm	\$ _____	265	\$ _____
	.2 Replace with 375mm Dia. PVC DR35 MH S249 - MH S340	lm	\$ _____	150	\$ _____
5.2	Over-Excavation (incl. Installation of Washed Rock) (Provisional)	m ²	\$ _____	104	\$ _____
5.3	Sanitary Manholes				
	.1 Remove and Replace Existing Manholes w/ New 1200 mm I.D. Barrel	v.m	\$ _____	21	\$ _____
5.4	Supply and Install New Frame and Cover				
	.1 NF 80 Frame & Cover	ea	\$ _____	9	\$ _____
5.5	Connection to existing sanitary mains	ea	\$ _____	4	\$ _____
5.6	Locate, Remove and Replace Existing Sanitary Services with New 100 mm Diameter PVC DR 28 Sanitary Services c/w Connections to Property Line (PROVISIONAL)	ea	\$ _____	19	\$ _____
5.7	Locate, Remove and Replace Existing Sanitary Services with New 150 mm Diameter PVC DR 28 Sanitary Services c/w Connections to Property Line (PROVISIONAL - MULTIFAMILY UNITS FROM 1+010 - 1+190)	ea	\$ _____	4	\$ _____
5.8	Bypass Pumping	LS	\$ _____	1	\$ _____
5.9	CCTV Sewer Inspection				
	.1 Construction Completion	lm	\$ _____	415	\$ _____
	.2 End of Warranty Period	lm	\$ _____	415	\$ _____
5.10	Temporary Water Supply	LS	\$ _____	1	\$ _____
Total Section 5: Sanitary Sewer					
CONSTRUCTION SUBTOTAL - SCHEDULE "C"					\$ _____

Note:

- The intent of the Contract is that excavated native backfill shall be reused as approved by the Engineer.
- Maintain existing sanitary, water and storm services at all times during the execution of the Work. Service interruptions and/or damage are the responsibility of the Contractor at no cost to the Owner.
- Construction Limits are as defined on drawings.
- The Bidder shall complete and submit pricing for the entire scope of work included in Schedules "A", "B", and "C".
- Temporary water and sanitary servicing to businesses and residences is to be included in Unit Costs provided.

UNIT PRICES

All unit prices include the cost of supply of new material and labour to install unless noted otherwise.

Schedule "C"
54 Street – 5 Avenue to 1 Avenue Sanitary Upgrade
Schedule of Quantities

Item	Description	Unit	Unit Price	Quantity	Extension
CONSTRUCTION COSTS					
Section 1: General					
1.1	Mobilization & Demobilization (assumes 7%)	LS	\$	1	\$
1.2	Traffic Accommodation (assumes 5%)	LS	\$	1	\$
Total Section 1: General					
Section 2: Surface Removals					
2.1	Asphalt Removal				
	.1 Remove and Dispose Existing Road Structure to Design Subgrade	m ²	\$	1,245	\$
2.2	Remove & Dispose Existing Concrete				
	.1 Curb & Gutter	lm	\$	40	\$
Total Section 2: Surface Removals					
Section 3: Roadways					
3.1	Top Lift Asphalt Concrete Pavement - Supply and Install (60mm Depth)	m ²	\$	1,245	\$
3.2	Bottom Lift Asphalt Concrete Pavement - Supply and Install (60mm Depth)	m ²	\$	1,245	\$
3.3	Supply and Install Granular Base Course (Des 2, Class 20) (150mm Depth)	m ²	\$	1,245	\$
3.4	Supply and Install Granular Sub-Base (300mm Depth)	m ²	\$	1,245	\$
3.5	Subgrade preparation - 150 mm Depth	m ²	\$	1,245	\$
3.6	Geogrid (Biaxial)	m ²	\$	1,245	\$
3.7	Non-Woven Geotextile	m ²	\$	1,245	\$
Total Section 3: Roadways					
Section 4: Concrete					
4.1	Standard Concrete Curb & Gutter (250mm Gutter) - Supply & Install	lm	\$	40	\$
Total Section 4: Concrete					
Section 5: Sanitary Sewer					
5.1	Sanitary Sewer Main				
	.1 Remove and Replace Existing				
	.1 Replace with 300mm Dia. PVC DR35	lm	\$	7	\$
	.2 Replace with 450mm Dia. PVC DR35	lm	\$	470	\$
	.3 Replace with 600mm Dia. Concrete	lm	\$	333	\$
5.2	Over-Excavation (incl. Installation of Washed Rock) (Provisional)	m ²	\$	203	\$
5.3	Sanitary Manholes				
	.1 Remove and Replace Existing Manholes w/ New 1200 mm I.D. Barrel	v.m	\$	30	\$
	.2 Remove and Replace Existing Manholes w/ New 1500 mm I.D. Barrel	v.m	\$	3	\$
	.3 Supply and Install New Manhole 1200mm I.D. Barrell	v.m	\$	8	\$
	.4 Remove and Dispose Existing Manholes	ea	\$	1	\$
5.4	Supply and Install New Frame and Cover				
	.1 NF 80 Frame & Cover	ea	\$	13	\$
5.5	Connection to existing sanitary mains	ea	\$	2	\$
5.6	CCTV Sewer Inspection				
	.1 Construction Completion	lm	\$	810	\$
	.2 End of Warranty Period	lm	\$	810	\$
5.7	Fillcrete Backfill	lm	\$	34	\$
5.8	Bypass Pumping	LS	\$	1	\$
Total Section 5: Sanitary Sewer					
Section 6: Landscape					
6.1	Landscaping Restoration	m ²	\$	790	\$
6.2	Supply and Install Fence	lm	\$	8	\$
Total Section 6: Landscape					
CONSTRUCTION SUBTOTAL - SCHEDULE "C"					\$ _____

Note:

- The intent of the Contract is that excavated native backfill shall be reused as approved by the Engineer
- Maintain existing sanitary, water and storm services at all times during the execution of the Work. Service interruptions and/or damage are the responsibility of the Contractor at no cost to the Owner.
- Construction Limits are as defined on drawings.
- The Bidder shall complete and submit pricing for the entire scope of work included in Schedules "A", "B", and "C".
- Temporary water and sanitary servicing to businesses and residences is to be included in Unit Costs provided.

UNIT PRICES

All unit prices include the cost of supply of new material and labour to install unless noted otherwise.

This Tender Form is executed under seal at _____

This ____ day of _____ 20__.

FOR CORPORATION:

The Corporate Seal of:

(Bidder – Print Name)

(Affix Seal)

was affixed by the following duly authorized signing authority:

(Print Name)

(Signature)

(Print Title)

additional authorized signing authority if required:

(Print Name)

(Signature)

(Print Title)

FOR INDIVIDUAL OR PARTNERSHIP:

Signed, sealed and delivered by:

(Bidder – Print Name)

(Bidder - Signature)

in the presence of:

(Witness - Print Name)

(Witness - Signature)

(Witness - Print Title)

(Witness - Print Address)

Notes: Should the Bidder not execute this Tender Form under corporate seal, the signing authorities of the company shall sign the Tender before a Witness who will then sign as a witness to the left of the authorities' signatures. The Witness will then complete an Affidavit of Execution before a Commissioner for Oaths and the affidavit shall be attached to the Tender.

If the Bidder is not registered to do business in the Province of Alberta, the Bidder shall also provide with the Tender evidence that the individuals who signed on behalf of the company are the proper signing authorities of the Company.

If the Company signs the Tender without a seal and such Tender is from outside the Province of Alberta, then the Affidavit of Execution must be signed before a Notary Public.

If the Bidder is not a Corporation but rather a partnership or sole proprietorship, then the individual(s) who sign must do so before a Witness in the same format as a company who signs without a corporate seal.

If the Tender is by a joint venture, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

- END OF SECTION 00 41 00 -

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS THAT

as Principal, and hereinafter called the Principal, and

as Surety, hereinafter called the Surety, are jointly and severally held and firmly bound unto the Town of Edson, in the province of Alberta, as Obligee, hereinafter called the Obligee, in the amount of

10% (Ten Percent) of the Tender Price _____ DOLLARS (\$ _____) lawful money in Canada, for the payment of which sum, well and truly to be made to the Obligee, its heirs, executors, administrators, successors, and assigns, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a written tender to the Obligee for Tender No. _____

Which tender closes on the _____ day of _____ 20__ for the following work:

10th AVENUE & 54th STREET UTILITY UPGRADES

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Tender of the aforesaid Principal shall be accepted within _____ days from the closing date of tender and the said Principal will, within the time required, enter into a formal Contract and give good and sufficient Bonds to secure the performance of the terms and conditions of the Contract, then this obligation shall be null and void; otherwise, the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount is in excess of the former.

Any suit under this Bond must be instituted within one (1) year from the date of the Bond. The Surety shall not be liable for a greater sum than the specified amount of this Bond.

The Surety shall be and remain bound on the obligation of this Bond whether or not the same has been executed by the Principal and whether or not there is any defect or insufficiency in the execution thereof by the Principal.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its duly authorized signing authority, this _____ day of _____ 20__.

Principal

Surety

(Authorized Officer – Signature) (Authorized Officer – Signature)

(Name of Authorized Officer – Please Print) (Name of Authorized Officer – Please Print)

(Position of Authorized Officer – Please Print) (Position of Authorized Officer – Please Print)

(Affix Seal)

(Affix Seal)

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend, or alter the coverage afforded by the policies listed below.

Name and Address of Agency	Companies Affording Coverages
	Company Letter A
Name and Address of Insured	Company Letter B
	Company Letter C
	Company Letter D

This is to certify that policies of insurance listed below have been issued to the insured named and are in force at this time.

Company Letter	Type of Insurance	Policy Number	Expiration Date	Limits of Liability in Thousands (000)		
				Type	Each Occurrence	Aggregate
	General Liability					
	Comprehensive Form			Bodily Injury		
	Contractual Liability					
	Independent Contractors					
	Products and Completed Operations			Property Damage		
	Excavation, Collapse, Shoring, and Underpinning					
	Broad Form Property Damage			Bodily Injury and Property Damage Combined		
	Employees as Additional Insureds					
	Occurrence Property Damage					
	Cross Liability			Fire Damage		
	Contingent Employers Liability					
	Premises and Operations Liability					
	Wrap-Up					
	Fire Damage					
	Others (specify):			Personal Injury		
	Automobile Liability					
	Comprehensive Form			Bodily Injury (each person)		
	Owned			Bodily Injury (each accident)		
	Hired					
	Non-Owned			Property Damage		
	Garage Liability			Bodily Injury and Property Damage Combined		
	Others (specify):					
	Excess Liability					
	Umbrella Form			Bodily Injury and Property Damage Combined		
	Other Than Umbrella Form					
	Other:					
	Course of Construction			All Risk Property Damage		
	Environmental Liability					
	Professional Liability					
				\$ _____ each claim or in the aggregate with a		
				\$ _____ each claim deductible.		

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES

Town of Edson PROJECT NAME: **10th AVENUE & 54th STREET UTILITY UPGRADES**

The Town of Edson is named as Additional Insured. The Named Insured's coverage is primary and other insurance is excess and non-contributory. Waiver of Subrogation is included.

Cancellation: The issuing company represents that these policies are endorsed to provide thirty (30) days prior written notice, to the below named certificate holder, of any cancellation or material change.

CERTIFICATE HOLDER:

TOWN OF EDSON
 605 – 50 STREET, PO BOX 6300
 EDSON, AB T7E 1T7

(Authorized Representative – Signature)

(Name of Representative – Please Print)

(Date)

Should it be required, _____, hereinafter called the Surety, in executing this Consent, hereby agrees if the Tender is awarded to _____, hereinafter called the Principal, within ____ days from the closing date of the tender, to become bound as Surety in both a Performance Bond and a Labour and Material Payment Bond with the Principal, each to be in the form, with all required provisions, and executed as required by the Contract Documents for _____ (____%) of the Contract Price, not exceeding an amount of _____ DOLLARS (\$_____)

for the fulfillment of the Contract for the work described and specified by the Contract Documents at the prices set forth in the attached Tender, unto the Town of Edson, as Obligee. The Surety, having an office at _____ in the Province of Alberta and satisfactory to the Town and allowed by the laws of the Province of Alberta to issue Performance Bonds in Alberta, is worth, over and above its present liabilities, the amount of the Bond required by the Contract Documents to be provided by the Principal.

10th AVENUE & 54th STREET UTILITY UPGRADES

Surety

(Authorized Officer – Signature)

(Name of Authorized Officer – Please Print)

(Position of Authorized Officer – Please Print)

(Affix Seal)

Notes: The Performance Bond shall be in the form provided in Section 00 61 13.13 or CCDC 221, and the Labour and Material Payment Bond shall be in the form provided in Section 00 61 13.15 or CCDC 222.

The Surety issuing this Consent must have an office in the Province of Alberta or be represented by an Agent with an office in the Province of Alberta.

- END OF SECTION 00 45 17 -

This Agreement, made on the ____ day of _____, 20__ between:

THE TOWN OF EDSON
(hereinafter called the Town),
a Municipal Corporation,
PARTY OF THE FIRST PART,

and

(hereinafter called the Contractor),
PARTY OF THE SECOND PART

WITNESSETH that the Contractor and the Town, for the considerations hereinafter named, agree as follows:

1.0 Scope of Work

The Contractor shall:

- 1.1 Furnish all of the materials (except as otherwise specified to be supplied by others) and all of the equipment and labour necessary to perform the Work described in the Contract Documents, all in accordance with the requirements and provisions of the Contract for the project entitled:

10TH AVENUE & 54th STREET UTILITY UPGRADES

prepared by the Town of Edson and signed in triplicate by both parties.

- 1.2 Perform, provide, and fulfill all requirements of the Contract.
- 1.3 Provide all Bonds and Insurance Certificates in accordance with the Contract.
- 1.4 Commence and perform the Work within the time provided in Article 24.0 or 25.0 of Section 00 21 13 – Instructions to Bidders, unless other arrangements have been approved by the Town in writing.
- 1.5 Attain Substantial Performance of the Work by **July 19, 2024 (with CCC completed on or before August 5, 2024)** subject to any adjustments in schedule as provided for in the Contract Documents
- 1.6 Warranty the Work as set out in Article 5.7 of Section 00 72 00 – General Conditions, or as otherwise stipulated in Section 00 73 00 – Supplementary Conditions.

2.0 Contents of the Contract

Contract Documents include all documents, listed as follows, that form the contents of the Contract:

- Tender Invitation
- Instructions to Bidders
- Tender Form
- Bid Bond and Consent of Surety

- Certificate of Insurance
- Performance Bond (where applicable)
- Labour and Material Payment Bond
- Certificate of Recognition or Temporary Letter of Certification
- Letter of Account from Workers' Compensation Board, rates, and LTI frequencies
- Contract Agreement
- General Conditions
- Supplementary Conditions
- Technical Specifications
- Drawings and Plans
- Yellowhead County - Engineering Design Standards (where applicable)
- Alberta Transportation - General Specifications and Specification Amendments for Highway and Bridge Construction – Edition 16, 2019 (GCS) (where applicable)
- Alberta Transportation - Standard Specifications for Highway Construction – Edition 16, 2019 (HCS) (where applicable)
- Appendices
- Addenda (where applicable)

3.0 Payment

If the Contractor promptly, faithfully, and properly fulfills the terms and conditions of the Contract in every detail to the satisfaction of the Town, the Town shall pay to the Contractor in lawful money of Canada the sum of \$ _____ (hereinafter called the Contract Price) subject to such adjustments, additions, and deductions as provided in the Contract. The quantities contained in the schedule in the Tender are approximate only and the final payment shall be made for the actual quantities that are incorporated in or made necessary by the work covered by the Contract. Any payment made to the Contractor shall be less all applicable holdbacks, including Builders' Lien Holdbacks.

4.0 Assignment and Transfer

The Contractor shall not, without the prior written consent of the Town, assign or transfer in any manner whatsoever the rights, liabilities, obligations and benefits of the Contract.

5.0 Extension of the Contract

Unless the Contractor and the Town expressly agree otherwise, all provisions of the Contract shall apply to any extension of the Contract.

6.0 Laws of Alberta

The Contract shall be construed in accordance with the laws of the Province of Alberta, and the Courts of Alberta shall have the exclusive jurisdiction to entertain any action arising under the Contract. If any provision of the Contract in any way contravenes the laws of the Province of Alberta, such provisions shall be severed from the Contract and the remaining provisions shall continue in force and effect. The Contract shall ensure to the benefit of and be binding upon the parties hereto, their respective heirs, executors, administrators, successors, and assigns.

7.0 Remedies

All remedies which the Contract confers upon the Town shall be deemed cumulative and no one exclusive of the other, or of any remedy conferred by law.

8.0 Notice

If either party is required to give notice to the other party under or in connection with the Contract, such notice will be effectively given if sent by registered mail or hand delivered to the Contractor at:

Attn:

and to the Town at:

Attn: Armia Mikhael, Infrastructure Manager

Town of Edson

605 – 50 Street

Edson, AB T7E 1T7

and if sent by registered mail will be considered as having been received by the party to whom it is directed seven (7) days after the mailing of such.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

FOR INDIVIDUAL OR PARTNERSHIP:

_____	_____
(Contractor Name – Please Print)	(Witness Name and Position – Please Print)
_____	_____
(Contractor – Signature)	(Witness – Signature)

FOR LIMITED COMPANY:

The Corporate Seal of:

_____	_____
(Contractor Name – Please Print)	
_____	_____
(Name and Position of Authorized Officer – Please Print)	
_____	_____
(Signature of Authorized Officer)	(Contractor's Seal – Affix Seal)
_____	_____
(Name and Position of Authorized Officer – Please Print)	(Witness Name and Position – Please Print)
_____	_____
(Signature of Authorized Officer)	(Witness – Signature)

Note: If the Tender is by a joint venture, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

FOR THE TOWN:

Town of Edson

_____	_____
(Name and Position of Authorized Officer – Please Print)	
_____	_____
(Signature of Authorized Officer)	(Town's Seal – Affix Seal)
_____	_____
(Name and Position of Authorized Officer – Please Print)	(Witness Name and Position – Please Print)
_____	_____
(Signature of Authorized Officer)	(Witness – Signature)

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS THAT

_____ as Principal, and hereinafter called the Principal, and

_____ as Surety, hereinafter called the Surety, are jointly and severally held and firmly bound unto the Town of Edson, in the province of Alberta, as Obligee, hereinafter called the Obligee, in the amount of

_____ DOLLARS (\$_____)
lawful money in Canada, for the payment of which sum, well and truly to be made to the Obligee, its heirs, executors, administrators, successors, and assigns, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract, hereinafter called the Contract, with the Obligee dated the _____ day of _____ 20__, pursuant to which the Principal has agreed to carry out the following work:

10TH AVENUE & 54TH STREET UTILITY UPGRADES

in accordance with the terms and conditions of the Contract, the Contract being by reference made a part hereof.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform the Contract including, without limiting the generality of the foregoing, its obligation to indemnify and save harmless the Obligee and to maintain the work for a full period in accordance with the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever the Principal shall be, and declared by the Obligee to be, in default under the Contract, the Obligee having performed the Obligee's obligations thereunder, the Surety may promptly remedy the default, or shall

- 1) Complete the Contract in accordance with its terms and conditions; or
- 2) Obtain a bid or bids for submission to the Obligee for completion of the Contract in accordance with its terms and conditions, and upon determination by the Obligee and Surety of the lowest responsible Bidder, arrange for a contract between such Bidder and Obligee (hereinafter referred to as the "contract of completion") and make available as work progresses (even though there should be a default, or a succession of defaults, under the contract of completion) sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first article hereof. The term "balance of Contract price", as used in this article, shall mean the total amount payable by the Obligee to the Principal under the Contract, less the amount properly paid by the Obligee to the Principal.

Any suit under this Bond must be instituted before the expiration period of two (2) years from the date on which final payment under the Contract falls due.

The Surety shall not be liable for a greater sum than the specified amount of this Bond.

The Surety shall be and remain bound on the obligation of this Bond whether or not the same has been executed by the Principal and whether or not there is any defect or insufficiency in the execution thereof by the Principal.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Obligee named herein, or the heirs, executors, administrators, or successors of the Obligee.

IN WITNESS WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its duly authorized signing authority, this _____ day of _____ 20__.

PRINCIPAL:

(Contractor Name – Please Print)

(Name and Position of Authorized Officer – Please Print)

(Signature of Authorized Officer) (Contractor's Seal – Affix Seal)

(Name and Position of Authorized Officer – Please Print) (Witness Name and Position – Please Print)

(Signature of Authorized Officer) (Witness – Signature)

SURETY:

(Surety Name – Please Print)

(Name and Position of Authorized Officer – Please Print)

(Signature of Authorized Officer) (Surety's Seal – Affix Seal)

(Name and Position of Authorized Officer – Please Print) (Witness Name and Position – Please Print)

(Signature of Authorized Officer) (Witness – Signature)

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS THAT

_____ as Principal, and hereinafter called the Principal, and

_____ as Surety, hereinafter called the Surety, are jointly and severally held and firmly bound unto the Town of Edson, in the province of Alberta, as Oblige, hereinafter called the Oblige, in the amount of

_____ DOLLARS (\$ _____)
lawful money in Canada, for the payment of which sum, well and truly to be made to the Oblige, its heirs, executors, administrators, successors, and assigns, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract, hereinafter called the Contract, with the Oblige dated the _____ day of _____ 20__, pursuant to which the Principal has agreed to carry out the following work:

10TH AVENUE & 54TH STREET UTILITY UPGRADES

in accordance with the terms and conditions of the Contract, the Contract being by reference made a part hereof.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if the Principal shall make payment to all claimants for all labour and material used or reasonably required for use in the performance of the Contract and should payment be properly made, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject to the following conditions:

1. For the purpose of this bond:
 - a) "claimant" means a person, including a body corporate, or a partnership, and the heirs, executors, administrators, or other legal representatives of a person to whom the context can apply according to law, who has provided labour and material and who has not been paid for the same by the Principal or a subcontractor, in accordance with the Principal's or Subcontractor's obligation to do so, provided that a person who rents equipment to the Principal or a subcontractor to be used in the performance of the Contract under a contract which provides that all or a part of the rent is to be applied towards the purchase thereof, shall only be a claimant to the extent of the prevailing Oblige rental rates for the period during which the equipment was used in the performance of the Contract.
 - b) "labour and material" means labour, equipment, materials or services used or reasonably required for use in the performance of the Contract.
 - c) "services" means water, gas, electrical power, light, heat, oil, gasoline, steam, telephone, architectural services, engineering services, technical services, construction camp rental, catering, and other similar services consumed or incurred by the Principal or a subcontractor in the performance of the Contract.

- d) "subcontractor" means a person, firm, or corporation not contracting with, or employed directly by, the Obligee for the doing of any work by contracting with, or employed by, the Principal, or by another subcontractor of the Principal, to perform the Work, or a portion thereof.
2. The Surety acknowledges that "Surety" means a person, firm, or corporation that guarantees to the Obligee the payment of creditors.
3. The Principal and the Surety hereby jointly and severally agree with the Obligee, as Trustee, that every claimant who has not been paid as provided for under the terms of the claimant's contract with the Principal or subcontractor before the expiration of a period of ninety (90) days after the date on which the last of such claimant's labour was performed or materials were furnished, may, as beneficiary of the trust herein provided for, sue on this Bond, prosecute the suit to final judgment for such sum or sums as may be justly due to such claimant under the terms of the claimant's contract with the Principal or subcontractor, and have execution thereon, provided that the Obligee is not obliged to do or take any act, action, or proceeding against the Surety on behalf of any claimant to enforce the provisions of this Bond. If any act, action, or proceeding is taken, either in the name of the Obligee or by joining the Obligee as a party to such proceeding, then such act, action, or proceeding shall be taken on the understanding and basis that the claimant who takes such act, action, or proceeding shall indemnify and save harmless the Obligee against all costs, charges, and expenses or liabilities incurred thereon, and any loss or damage resulting to the Obligee by reason thereof; provided still further that, subject to the foregoing terms and conditions, a claimant may use the name of the Obligee to sue on and enforce the provisions of this Bond.
4. No suit or action shall be commenced pursuant to Clause 3 hereof by any claimant unless such claimant provides notice, within the time limits hereinafter set forth, to each of the Principal, Surety, and Obligee, stating the amount that is claimed. Such notice shall be served by mailing the same to the Principal, Surety, and Obligee at the addresses indicated in this Bond, or served in any manner in which legal process may be served in the Province of Alberta. Such notice shall be given:
 - a) In respect of any claim for the amount or any portion thereof required to be held back from the claimant by the Principal or subcontractor under the terms of the claimant's contract with the Principal or subcontractor, within one hundred and twenty (120) days after such claimant should have been paid in full under the claimant's contract with the Principal or subcontractor;
 - b) In respect of any claim other than for the holdback or portion thereof, referred to in the foregoing, within one hundred and twenty (120) days after the date upon which such claimant did or performed the last of the work, or furnished the last materials for which such claim was made under the claimant's contract with the Principal or subcontractor.
5. Any suit by a claimant under this Bond shall be instituted before the expiration of a period of one (1) year from the date on which the Principal ceased work on the Contract, including work under the warranties and guarantees provided in the Contract, and shall be institutes in a court of competent jurisdiction in the Province of Alberta.
6. Upon receipt by the Surety, at the address shown in this Bond, of a notice of claim from a claimant, the Surety shall immediately commence its investigation of the claim

- and, within fifteen (15) days, send, to the claimant and the Obligee, written acknowledgement of the notice of claim and a statement of the procedures to be followed by the claimant in order to attempt to settle the claim.
7. Pursuant to Clause 6 hereof, and:
 - a) Providing the claim is not disputed, the Surety, Principal, or both shall make payment to the claimant within thirty (30) days after the date of agreement on the quantum of the claim; or
 - b) In the event the claim is disputed, the Surety, Principal, or both shall, within thirty (30) days, provide written notice to the claimant and the Obligee of the dispute, setting out the grounds of dispute.
 8. Any material change in the Contract between the Principal and the Obligee shall not prejudice the rights or interests of any claimant under this Bond, who is not bringing about or has not caused such change.
 9. The amount of this Bond shall be reduced by, and to the extent of, any payment or payments made in good faith, and in accordance with the provisions hereof, by the Surety.
 10. Where the aggregate of claims appears to the Obligee to exceed the sum of the bond amount and money due and payable to the Principal, the Obligee and the Surety may agree to suspend payment until all claimants have substantiated their claims.
 11. The Surety shall not be liable for a greater sum than the specified amount of this Bond.

IN WITNESS WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its duly authorized signing authority, this _____ day of _____ 20__.

PRINCIPAL:

(Contractor Name – Please Print)

(Name and Position of Authorized Officer – Please Print)

(Signature of Authorized Officer) (Contractor's Seal – Affix Seal)

(Name and Position of Authorized Officer – Please Print) (Witness Name and Position – Please Print)

(Signature of Authorized Officer) (Witness – Signature)

SURETY:

(Surety Name – Please Print)

(Name and Position of Authorized Officer – Please Print)

(Signature of Authorized Officer) (Surety's Seal – Affix Seal)

(Name and Position of Authorized Officer – Please Print) (Witness Name and Position – Please Print)

(Signature of Authorized Officer) (Witness – Signature)

- END OF SECTION 00 61 13.15 -

1.0	GENERAL	1
1.1	Definitions	1
1.2	Scope of Work	3
1.3	Contract Documents	3
1.4	Drawings and Specifications	5
1.5	Clarifications	5
1.6	Ownership of Specifications, Drawings, and Models	6
2.0	CONTRACTOR	6
2.1	Superintendent	6
2.2	Employees, Wages, and Working Conditions	6
2.3	Subcontractors	7
2.4	Other Contractors	7
3.0	PRODUCTS	8
3.1	Products and Equipment	8
3.2	Delivery and Storage of Products	9
4.0	EXECUTION OF THE WORK	9
4.1	General	9
4.2	Water	10
4.3	Surveys and Plans	11
4.4	Shop Drawings	11
4.5	Utilities	12
4.6	Cutting and Remedial Work	12
4.7	Site Conditions	13
4.8	Subsurface or Concealed Conditions	13
4.9	Inspection of the Work	14
4.10	Rejected Work	14
4.11	Cleaning Up	15
4.12	Force Majeure	15
4.13	Delays	16
4.14	Delay Costs	16
4.15	Completion Schedule	17
4.16	Contractor's Work Plan	17
4.17	Work on Roads	17
4.18	Notifying Affected Parties	17
4.19	Allowable Working Hours on the Site	18
4.20	Use of Completed Portions	18
5.0	PAYMENTS AND CERTIFICATES	18
5.1	Applicable Taxes	18
5.2	Applications for Progress Payment	19
5.3	Holdbacks	21
5.4	Substantial Completion Certificate	21
5.5	Construction Completion Certificate	22
5.6	Release of Holdback	22

5.7	Warranty	23
5.8	Liability for Landscaping, Trees, and Shrubs Under Warranty	23
5.9	Final Acceptance Certificate	24
5.10	Non-Waiver of Responsibility	24
5.11	Audits	24
5.12	Electronic Payment	25
6.0	CHANGES	25
6.1	General	25
6.2	Change Order	25
6.3	Change Directive	26
6.4	Valuation of Change	26
6.5	Quantity Variation	28
7.0	RIGHTS AND REMEDIES	28
7.1	Town's Right to do Work	28
7.2	Town's Right to Stop Work or Terminate Contract	29
7.3	Contractor's Right to Stop Work or Terminate Contract	30
8.0	DISPUTES	30
8.1	Negotiation	30
8.2	Notice of Dispute	31
8.3	Referee's Review	31
8.4	Referee Costs	33
8.5	Arbitration	33
9.0	PROTECTION OF WORK, PROPERTY, AND LIFE	33
9.1	Use of Premises and Overloading	33
9.2	Protection of Work, Property and Life	33
9.3	Construction Work at or Near Pipelines and Transmission Lines	34
9.4	Hazardous Products and Chemicals	35
9.5	Emergencies	35
10.0	APPLICABLE LAWS	36
10.1	Laws, Notices, Permits, and Fees	36
10.2	Workers' Compensation	36
10.3	Occupational Health and Safety	37
10.4	Patent Fees	37
10.5	Importing Fees and Indemnity	38
10.6	Credits or Grants Applicable to the Work	38
10.7	Licensing	39
11.0	BONDS AND INSURANCE	39
11.1	Performance Bond	39
11.2	Labour and Material Payment Bond	39
11.3	Contractor's Insurance	40
12.0	DAMAGES AND INDEMNITY	41
12.1	Damages and Mutual Responsibility	41
12.2	Indemnification	41

12.3 Waiver of Claims

42

Schedule A – Rules of Arbitral Procedure

1.0 GENERAL

1.1 Definitions

- a) "Applicable Laws" means all statutes, laws, bylaws, regulations, ordinances, orders, directives, permits, licenses and requirements of governmental or other public authorities having jurisdiction, and all amendments thereto, relating to the Work or the performance of the Work.
- b) "Cash Allowance" shall mean the amount included in the Contract price for work that is partially defined but not detailed or specified.
- c) Certificates:
 - i) "Progress Payment Certificates" shall mean certificates issued by the Town periodically, based on which payment on account are made.
 - ii) "Substantial Completion Certificate (SCC)" shall mean a certificate issued by the Town upon Substantial Performance of the Work.
 - iii) "Construction Completion Certificate (CCC)" shall mean a certificate issued by the Town upon actual completion of the Work as provided in the Contract Documents.
 - iv) "Release of Holdback Certificate" shall mean a certificate issued by the Town upon expiration of the lien period. The sums included on this certificate shall constitute Final Payment.
 - v) "Final Acceptance Certificate (FAC)" shall mean a certificate issued by the Town within ten (10) days of the end of the Warranty Period provided the conditions of the Contract have been fulfilled.
- d) Changes:
 - i) "Change" means any change in, addition to, or deletion from the Work.
 - ii) "Change Directive" means a written instruction from the Town directing a Change prior to the Owner and the Contractor agreeing on an adjustment in the Contract Price.
 - iii) "Change Order" means a written communication issued by the Town, duly signed by the Town and the Contractor, authorizing a change in the Work in accordance with the Contract.
 - iv) "Change Quotation" means a written quotation from the Contractor for an adjustment in the Contract Price or Completion Schedule, or both, in response to a Contemplated Change Notice.
 - v) "Contemplated Change Notice" is a written communication from the Town to the Contractor requesting the Contractor's proposed adjustments to the Contract Price or Completion Schedule, or both, for contemplated changes to the Work.
- e) "Town" means the Corporation of the Town of Edson. The Town may designate the Engineer or another party to act on behalf of the Town as the Town's representative from time to time.

- f) "Completion Date" means the date by which the Work is to be completed as stipulated in Article 1.5 of Section 00 52 00 – Contract Agreement.
- g) "Completion Schedule" means the schedule for completion of the various portions and phases of the Work.
- h) "Contract" or "Contract Documents" shall mean and include all documents that are integral to the Contract Agreement as listed in Article 2.0 of Section 00 52 00 – Contract Agreement.
- i) "Contract Drawings", "Drawings", or "Plans" shall mean all plans, details, profiles, drawings, sketches, or copies exhibited or used in connection with the Work and integral to the Contract Documents.
- j) "Contract Price" means the amount indicated in Article 3.0 of Section 00 52 00 – Contract Agreement, which may be amended by Change Order, representing the amount that the Town will pay the Contractor for the performance of the Work in accordance with the Contract.
- k) "Contractor" means the person, firm, or corporation which has been awarded this Contract as identified in the Contract Agreement and authorized by the Town to proceed with the Work as outlined herein.
- l) "Day" or "Working Day" means days other than Saturdays, Sundays, and Statutory Holidays.
- m) "Engineer" means the Town Engineer for the Town of Edson or such other professional consultant appointed by the Town.
- n) "Event of Force Majeure" means any occurrence, other than the financial capability of a party or an event constituting a delay under Article 4.11 – Force Majeure, which is beyond the control and without the fault or negligence of the party relying on such occurrence, and which by the exercise of reasonable diligence that party could not at the time of bidding have reasonably contemplated happening and is unable to prevent or provide against.
- o) "Field Order" is a written communication issued by the Town, at the site and duly signed by the Contractor, authorizing a minor change in the Work, clarifying the Contract Documents, issuing instructions, or requesting information.
- p) "Force Account" means the method of calculating payment the Contractor shall receive for work performed as set out in Article 6.4 b.
- q) "Other Contractor" shall mean any person, firm, or corporation employed by or having a Contract directly or indirectly with the Town otherwise than through the Contractor. This includes the Town's own forces conducting work directly or indirectly related to the Work.
- r) "Products" means materials, machines, equipment, and fixtures as required by the Contract but does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the Work as typically referred to as construction machinery and equipment.
- s) "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, and data that are provided by the Contractor to illustrate details of a portion of the Work.

- t) "Site", "Work Site", or "Worksite" means the land and other places on, into, or through which the Work is to be executed under the Contract or any adjoining land, path, or street which may be allotted or used for the purpose of carrying out the Contract.
- u) "Specifications" and "Technical Specifications" refer to those portions of the Contract Documents, wherever located and whenever issued, consisting of written requirements and standards for Products, systems, workmanship, and the services necessary for the performance of the Work.
- v) "Subcontractor" includes only the person, firm, or corporation having a Contract with the Contractor for the execution of a part or parts of the Work.
- w) "Substantial Performance" or "Substantial Completion" shall refer to the definition of "substantial performance" as provided in the Builder's Lien Act of Alberta.
- x) "Supplier" means the person, firm, or corporation supplying equipment or material to the Work.
- y) "Utility" or "Utilities" has the same meaning as the words "public utility" in the Municipal Government Act – Alberta and shall, in addition, include gas and oil pipelines and telecommunications lines and any other privately owned utilities.
- z) "Warranty Period" shall be the period of time as stated in Article 1.6 of Section 00 52 00 – Contract Agreement immediately following the date indicated in the Construction Completion Certificate (CCC).
- aa) "Work" or "Works" means the doing of all things, whether temporary or permanent, that are to be done by the Contractor pursuant to the terms and provisions of the Contract and in particular, but without limiting the generality of the foregoing, includes the furnishing of all labour, products, and equipment necessary or incidental to the performance of the Contract, including all extra or additional Work or materials, matters or things which may be ordered by the Town as herein provided.

Words in the singular include the plural, and words in the plural include the singular where the context so requires. The use of the third personal or impersonal pronouns in the Contract Documents may refer to the same party when used in that sense.

1.2 Scope of Work

In signing the Contract Agreement, the Contractor understands the scope of Work to be performed and that the Work, as specified, will be carried out in accordance with the terms and conditions of the Contract Documents. The Contractor shall be bound by the Tender Prices submitted by the Contractor in the Tender Form for carrying out of the Work in accordance with Contract Documents. The Contract Documents constitute the entire agreement between the parties with respect to the Work and supersedes all previous communications, representations, warranties and agreements, either written or verbal.

1.3 Contract Documents

- a) The Contractor and the Town shall sign and seal at least three original copies of the Contract Documents. The Town will retain two copies of the executed contract documents and at least one copy will be provided to the Contractor.

- b) The Work is intended to be a complete Work in every respect. The Contractor shall abide and comply with the Contract Documents taken as a whole, as these are intended to comprise everything necessary for completion of each branch of the Work. The Contractor shall not deviate from the Work described in the Contract Documents unless the Town issues a Change Order authorizing a change in the Work.
- c) The Contract Documents are complementary and what is called for on one shall be as binding as if called for by all. The intention of the Contract Documents is to include all labour, products, equipment, supervision, and transportation necessary for the proper execution and performance of the Work. Materials or Work described in words which so applied have a well-known technical or trade meaning, shall be held to refer to such recognized meanings and standards.
- d) Should there be any conflict or inconsistency within the Contract Documents, the Contractor shall notify the Town within ten (10) days of discovering such conflict or inconsistency. Where the Contractor fails to do so, the Contractor shall be held responsible for correcting the Work in accordance with the Town's requirements. The Contractor shall bear all the cost of such corrections.

In the event of an inconsistency or conflict in the provisions of the drawings or specifications, such provisions shall take precedence and govern in the following order:

- i) Contract Agreement
- ii) Addenda (if any)
- iii) Supplementary Conditions
- iv) General Conditions
- v) Detailed Specifications
- vi) Project Specific Drawings
- vii) Executed Tender Form
- viii) Instructions to Bidders
- ix) Tender Invitation

Should any dispute arise with regard to the Contract Documents or should any portion of the Contract Documents be obscure or capable of more than one interpretation, the dispute shall be decided by the Town whose decision shall be final unless the Contractor disputes the decision and refers the disputed decision for resolution in accordance with Article 8.0 – Disputes.

- e) The apparent generality of the Contract Documents as to any detail or the apparent omission from them of a detailed description shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the first quality are to be used.
- f) The Contractor shall assume full responsibility for the interpretation of the Contract Documents for Subcontractors.
- g) Contract Documents are grouped into divisions and subdivisions for the convenience of the Town. The Contractor is solely responsible for the

appointment of the Work, and the coordination thereof, among Subcontractors and Suppliers. The Contractor shall have no claims arising from the Contractor's failure to adequately apportion or coordinate the Work among Subcontractors and Suppliers.

- h) All portions of the Work shall conform to the requirements of the Contract Documents, Applicable Laws, or applicable Town of Edson– Municipal Engineering Standards (where specified), whichever is the most stringent. Where the Contractor is uncertain as to the most stringent of these requirements, the Contractor shall refer the issue to the Town whose decision shall be final unless the Contractor disputes the decision and refers the disputed decision for resolution in accordance with Article 8.0 – Disputes.
- i) In addition to the executed copy of the Contract Documents, the Town will furnish to the Contractor, without charge, up to six (6) copies of the Contract Documents, or as stated in the Supplementary Conditions.
- j) The Contractor shall maintain one (1) copy of the Contract Documents, submittals, reports, and records of meetings on the Site, in good order and marked to record all changes made during construction. These shall be made available to the Town. These documents shall be delivered to the Town upon completion of the Work.

1.4 Drawings and Specifications

- a) The Work in the Contract is detailed in the Specifications and accompanying Drawings, together with such other working and detailed drawings as may be furnished to the Contractor from time to time during the progress of the Work.
- b) Unless expressly excluded, any portion of the Work or Product shown on the Drawings and not described in the Specifications, or any portion of the Work or Product described in the Specifications and not shown on the Drawings, which is reasonably implied by and evidently necessary and usually provided for each portion of the Work, shall be done or supplied by the Contractor as if it were both shown on the Drawings and described in the Specifications.
- c) Any references to recognized standard specifications, such as C.S.A. or A.S.T.M., shall be to the then current edition as of the closing date of the Tender Period, unless specifically noted in the reference.
- d) Notes on the Drawings shall be considered part of the Specifications.

1.5 Clarifications

- a) The Town may, on its own initiative or upon request of the Contractor, provide clarifications, by means of drawings, Field Orders, or otherwise, which are necessary for the execution of any aspect of the Work. All clarifications shall be consistent with the Contract and the Work shall be executed in conformity with the clarifications. In providing such clarifications, the Town shall have authority to make minor changes in the Work, consistent with the Contract.
- b) If either the Contractor or the Town so requests, they shall jointly prepare a revised schedule incorporating the clarifications. In the event that the clarifications require a change to the Contract Price or changes to the Completion Schedule for the Work or portions of the Work, then the Contractor

shall provide the information required for the issuance of a Change Order in accordance with Article 6.0 – Changes.

- c) If a Change Order is not issued, there shall be no allowance for changes to the Completion Schedule for the Work or portions of the Work, or for any change to the Contract Price.

1.6 Ownership of Specifications, Drawings, and Models

- a) All Drawings, Specifications, designs, samples, and copies thereof and all models or samples furnished by the Town are, and shall remain, the property of the Town. The Contractor shall not use such Drawings, Specifications, designs, samples, copies, or models for any other purpose except to complete the Work as required by the Contract.
- b) Any models or designs furnished by the Contractor to the Town in the performance of the Work shall become the property of the Town and shall be provided to the Town at the Town's request. The Contractor shall not use such models or designs for any other purpose except to complete the Work as required by the Contract.
- c) The Contractor represents and warrants that the Contractor has the right to provide the Town with such models or designs, and that the Contractor will pay for any required licenses, permits, or fees that may be applicable to the Town's use of such models or designs.

2.0 CONTRACTOR

2.1 Superintendent

- a) The Contractor shall provide sufficient supervision to the Work.
- b) The Contractor shall ensure that a competent superintendent and any necessary assistants, all qualified and experienced in matters concerning safety, efficiency, and quality of the Work, are at the Site during the progress of the Work. The superintendent shall be satisfactory to the Town and shall not be changed without the written consent of the Town, unless the superintendent proves to be unsatisfactory to the Contractor, or ceases to be in the Contractor's employ. The Town shall have the right to require the Contractor to replace the superintendent at any time in the event that the Town is of the opinion that the superintendent is unqualified or unsatisfactory.
- c) The superintendent shall represent the Contractor on the Site. Any written directions, instructions, or orders relating to the Work that are provided by the Town to the superintendent shall be considered sufficient notice of such directions, instructions, or orders to the Contractor.

2.2 Employees, Wages, and Working Conditions

- a) The Contractor shall provide a sufficient number of qualified personnel to enable timely and proper execution and completion of the Work. All such personnel shall be competent, literate in English, and qualified by education, training, and experience, and in all other respects capable of carrying out the tasks to which

each is assigned. The Contractor shall be responsible to maintain good order and discipline among the Contractor's employees engaged on the Work.

- b) Being under the influence of, or in the possession or use of intoxicating beverages or drugs on the Work shall be sufficient reason to declare an employee as unfit. Should any employee, at any time during the performance of the Work, be deemed by the Town to be incompetent or unfit, the Contractor shall replace the employee at the Town's request.
- c) The Contractor covenants and agrees that wages and working conditions of all persons employed by the Contractor or by any Subcontractor shall be fair and reasonable, having regard to the general level of wage rates and working conditions prevailing in the Alberta Capital Region for the duration of the Contract.
- d) The Contractor shall employ Canadian labour to the fullest extent possible.
- e) The Contractor shall ensure that no person under the Contractor's employ is discriminated against.

2.3 Subcontractors

- a) The Contractor agrees that the list of names of Subcontractors provided upon contract award is the list of Subcontractors that the Contractor proposes to use to carry out those portions of the Work noted. The Contractor shall not make any changes to the list of Subcontractors without the prior written approval of the Town.
- b) The Town reserves the right to object to any Subcontractor provided by the successful bidder. If the Town objects to a Subcontractor proposed by a Contractor, the Contractor shall nominate another Subcontractor acceptable to the Town. If the Town requires the Contractor to nominate another Subcontractor, the Contract Price and Schedule shall be adjusted by the differences occasioned by such required change. The Contractor shall not be required to employ as a Subcontractor, any person or firm to which the Contractor may reasonably object.
- c) The Town may, at the request of a Subcontractor, provide said Subcontractor with information of the amounts certified to the Subcontractor's account.
- d) The Contractor shall be responsible to the Town for the acts and omissions of Subcontractors and persons directly or indirectly employed by them.
- e) Nothing contained within the Contract shall create any contractual relation between any Subcontractor and the Town.
- f) The Contractor shall bind every Subcontractor to the terms and conditions of the Contract to the extent that those terms and conditions apply to the portion of the Work to be carried out by the Subcontractor.

2.4 Other Contractors

- a) The Town reserves the right to award separate contracts or to use its own forces in connection with the undertaking, of which the Work is a part, and the Contractor shall properly connect and coordinate the Work with that of Other Contractors to whom contracts are awarded.

- b) If any part of the Work to be performed by the Contractor depends, for its proper execution or result, upon the work of any Other Contractor, as outlined in Article 2.4a), the Contractor shall promptly report to the Town in writing any unfinished work or defects in the work of the Other Contractor that may interfere with the proper execution of the Work. Should the Contractor fail to report the defects, the Contractor shall have no claim against the Town by reason of the defective or unfinished work of any Other Contractor except for latent defects not reasonably noticeable at the time of the commencement of the Work.
- c) In awarding separate contracts, the Town shall be responsible for coordinating insurance coverage.
- d) Disputes and other matters in question between the Contractor and Other Contractors shall be dealt with in accordance with Article 8.0 - Disputes.

3.0 PRODUCTS

3.1 Products and Equipment

- a) Unless stipulated otherwise in the Contract, the Contractor shall provide and pay for all Products, material, labour, light, power, heating, water, temporary works, and everything else necessary for the execution of the Work.
- b) Unless stipulated otherwise in the Contract, Products to be incorporated into the Work shall be new and workmanship and Products shall be of good and merchantable quality, and not less than the quality specified.
- c) In the absence of other standards stipulated by the Contract Documents, all work, materials, and equipment shall conform to, or exceed, the applicable standards of the latest editions of the Canadian Government Specification Board, the Canadian Standards Association, or the National Building Code of Canada, whichever is most stringent.
- d) The Contractor shall, if required by the Town, furnish satisfactory evidence of such quality of the Products to be incorporated in the Work. The Contractor shall furnish, for the Town's approval, such samples as the Town may reasonably require. The Work shall be in accordance with approved samples.
- e) If the Contractor provided the Town with a list of Product manufacturers or suppliers in the Contractor's Tender, the Contractor shall not change from those Product manufacturers or suppliers without the written consent of the Town. Nothing contained within the Contract shall create any contractual relation between any Product manufacturer or supplier and the Town.
- f) The Town reserves the right to object to any product manufacturer or supplier provided by the successful bidder upon contract award. If the Town objects, the Contractor shall nominate an alternative acceptable to the Town. If the Town requires the Contractor to nominate an alternative manufacturer or supplier, the Contract Price and Schedule shall be adjusted by the differences occasioned by such required change. The Contractor shall not be required to use as a manufacturer or supplier, any person or firm to whom the Contractor may reasonably object.

3.2 Delivery and Storage of Products

- a) The Contractor shall be responsible for the delivery and storage of Products.
- b) The Contractor shall be liable for the loss or destruction of Products or equipment supplied by the Town while they are on the Site.
- c) The Contractor and the Town shall examine the Products and equipment supplied by the Town at the time of delivery to the Site, and shall jointly prepare a statement of acceptance, noting the value of delivered Products and rejecting any Product that does not meet the requirements provided in the Specifications.
- d) The Town will not pay for Products at the Site that have not been incorporated into the Work.

4.0 EXECUTION OF THE WORK

4.1 General

- a) The Contractor agrees to:
 - i) Efficiently and expeditiously perform all Work in accordance with the Contract Documents;
 - ii) In the performance of the Work, exercise a standard of care and skill normally exercised by contractors performing this type of construction work; and
 - iii) Perform the Work in a safe and environmentally sound manner and in compliance with the Applicable Laws.
- b) The Contractor represents and warrants to the Town that:
 - i) The Contractor has the experience, resources, personnel, and capability to expeditiously and diligently perform the Work;
 - ii) The Contractor is duly incorporated and validly existing under the laws of the Province of Alberta;
 - iii) Has all required permits, licenses, and authorizations necessary to carry on its business and to be obtained by it to conduct the Work; and
 - iv) The title to any and all plant, products, materials, and equipment, which are to be provided by the Contractor for incorporation into the Work, shall, upon delivery to the site, be free from any and all claims, liens, charges, encumbrances, or security interests of any kind whatsoever.
- c) The Contractor shall have complete control of the Work except as provided in Article 9.5 – Emergencies. The Contractor shall direct and supervise its employees, subcontractors, and suppliers, and inspect their work to ensure that all portions of the Work conform, in each and every respect, to the Contract Documents and to good and proper construction practices.
- d) The Contractor shall be solely responsible for the design, erection, operation, maintenance, and removal of all temporary structures and other construction facilities and the design and execution of construction methods required in their use. Where required by Applicable Laws or by the Contract Documents, the Contractor shall engage and pay for the services of a Professional Engineer,

registered to practice in the Province of Alberta and skilled in the appropriate discipline, to design such structures and facilities.

- e) Neither acceptance of any part of the Work by the Town, nor payment to the Contractor, shall relieve the Contractor from its responsibilities under these Contract Documents, whether pursuant to any of the warranties or guarantees expressed or implied herein, or otherwise.
- f) The Contractor shall provide the Town with verbal or written reports in reasonable detail promptly upon the reasonable request of the Town, and shall attend meetings as required by the Contract Documents, or as otherwise requested by the Town.
- g) The Contractor shall ensure that no activities or actions are undertaken in the performance of the Work by the Contractor, its subcontractors, or its suppliers which would adversely affect, restrict, or limit in any way the continued operation of the Town's facilities or plant which are in operation, unless required to perform the Work and done in accordance with the Completion Schedule or otherwise authorized by the Town.

4.2 Water

- a) Where performance of the Work requires water supply, the Contractor may obtain water from the Town's fire hydrants provided the following conditions are met:
 - i) Obtain Fire Hydrant permit from Public Works;
 - ii) Immediately after each use, the Contractor shall close the portable butterfly valve and shall turn the hydrant operating nut to the closed position to prevent any backflow contamination in the water mains;
 - iii) The operating nut shall not be over-tightened as to damage the hydrant when turning it off;
 - iv) A list of hydrants used by the Contractor (and subcontractors) shall be submitted by the Contractor to the Town on a weekly basis, identifying the location of the hydrant, company name of user, and the date of use;
 - v) The Contractor shall be responsible for all claims arising from the misuse of Town hydrants by the Contractor; and
 - vi) Access to fire hydrants must be maintained at all times for emergency services.
- b) Provide all necessary temporary piping and, upon completion of the Work, remove all such temporary piping.
- c) Failure to meet the preceding conditions may result in penalties and related costs, incurred by the Town, to be charged to the Contractor.
- d) The Contractor is not authorized to operate any existing main valve in the Town's water distribution system. The Public Works Department must be contacted to operate any existing main valve.

4.3 Surveys and Plans

- a) The Town will provide plans describing the limits of the Site, easements, and rights-of-way. The Town shall, in cooperation with the Contractor, establish reference points for construction which are necessary for the Contractor to proceed with the Work.
- b) The Contractor shall advise the Town whenever any established reference point is lost, destroyed, damaged, or requires relocation as a result of the Contractor's operations. Surveys required to replace reference points under this article shall be at the Contractor's expense.
- c) The Contractor shall, at the Contractor's own expense, provide all other surveys as required for the performance and execution of the Work, and shall, on request, furnish to the Town copies of plans of those surveys.

4.4 Shop Drawings

- a) The Contractor shall provide Shop Drawings as required in the Contract Documents.
- b) The Contractor shall review all Shop Drawings prior to submission to the Town. The Contractor represents by this review that:
 - i) The Contractor has determined and verified all field measurements, field construction conditions, materials, Product requirements, catalogue numbers, and similar data or will do so; and
 - ii) The Contractor has checked and coordinated each Shop Drawing with the requirements of the Contract Documents.
- c) The Contractor shall confirm the review of each Shop Drawing by stamp, date, and signature of the person responsible for the review. At the time of submission the Contractor shall notify the Town in writing of any deviations in the Shop Drawings from the requirements of the Contract Documents.
- d) The Contractor shall submit Shop Drawings to the Town to review in orderly sequence and sufficiently in advance so as to cause no delay in the Work or in the work of Other Contractors. Upon request of the Contractor or the Town, they jointly shall prepare a schedule of the dates for submission and return of Shop Drawings. Shop Drawings which require approval of any legally constituted authority having jurisdiction shall be submitted to such authority by the Contractor for approval.
- e) The Contractor shall submit Shop Drawings in the form specified or as the Town may direct. The Town will review and return Shop Drawings in accordance with the schedule agreed upon or otherwise with reasonable promptness so as to cause no delay. The Town's review is for conformity to the design concept and for general arrangement only. The Town's review shall not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or for meeting all requirements of the Contract Documents unless the Town expressly notes the acceptance of a deviation on the Shop Drawings.
- f) Upon the Town's request, the Contractor shall revise and resubmit Shop Drawings which the Town rejects as inconsistent with the Contract Documents, unless otherwise directed by the Town. The Contractor shall notify the Town in

writing of any revisions to the resubmission other than those requested by the Town.

4.5 Utilities

- a) If it is necessary to work on or near any Utilities, the Contractor shall, at the Contractor's own expense, support the Utility to maintain uninterrupted service. Any damage caused by the Contractor's operations must be made good at the expense of the Contractor, and the Contractor shall be liable for any and all claims against or by the Town arising in any way from interference with the Utility by the Contractor.
- b) No additional compensation shall be payable to the Contractor for any delays, inconvenience, or damage sustained due to interference from any Utility or the operation of moving a Utility whether temporarily or permanently, and the interference or move shall be given due consideration in the scheduling of the Work and shall be undertaken at the scheduled time unless alternate arrangements are made with the Town. The Contractor shall be solely responsible for all costs and time required for work around any Utility.
- c) The Contractor shall notify the operator of any Utility affected by the Work at least 48 hours in advance of work on or near the Utility. The Contractor shall comply with all directions and requirements issued by the Utility operator in relation to the Utility.
- d) The Contractor shall notify all Utility operators and ensure that Utility lines are staked in advance of work on or near the Utility. Such staking shall not be deemed to be a representation or warranty by the Town that the Utility has been properly located.
- e) The Town and Utility operator give no representation or warranty that the location of any such Utility line or structure is marked correctly or marked at all on the Drawings.

4.6 Cutting and Remedial Work

- a) The Contractor shall perform any cutting and remedial work required to ensure the several parts of the Work fit together properly.
- b) The Contractor shall coordinate the Completion Schedule for the Work to ensure that the cutting and remedial work and time are kept to a minimum.
- c) Should the Town or anyone employed by the Town be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided herein and added to the Contract Price through issuance of a Change Order.
- d) The Contractor shall not endanger any existing work by cutting, digging, or otherwise and shall not cut or alter the work of any Other Contractor unless otherwise directly by the Town.

4.7 Site Conditions

- a) The Contractor accepts the Site and the obligation to perform the Work in the condition existing at the close of the Tender Period. The Contractor acknowledges that the Contractor has investigated the site is satisfied as to:
 - i) The nature of the Work;
 - ii) The location of, and all conditions relating to, the site including, but not limited to, accessibility, general character, surface conditions, utilities, roads, uncertainties of seasonal weather, and all other physical, topographical, and geographical conditions;
 - iii) The general character, quality, quantity, and availability of equipment and materials required to execute and complete the Work;
 - iv) All environmental risks, conditions, Applicable Laws, and restrictions applicable to the Contractor or the Work that might affect the Work;
 - v) All conditions affecting labour including, but not limited to, availability, productivity, and administrative practices including those relating to safety, prevailing at or applicable to the Work; and
 - vi) The magnitude of the construction work required to execute and complete the Work;
- b) Any failure by the Contractor to discover matters which affect or could affect the Work shall not relieve the Contractor from its obligations under these Contract Documents or otherwise affect the Contract Price.

4.8 Subsurface or Concealed Conditions

- a) If the Contractor discovers subsurface or concealed conditions at the Site are substantially different from those indicated in the Contract Documents or otherwise represented by the Town to the Contractor, and such conditions may affect the execution of the Work with respect to time, material, cost, or otherwise, then the Contractor shall immediately notify the Town and confirm such notification in writing within two (2) days of finding such substantial difference in conditions.
- b) The notice provided by the Contractor must include a description of the subsurface or concealed conditions and the Contractor's estimate as to the effect such conditions will have on the execution of the Work with respect to time, material, cost, or otherwise.
- c) The Town will promptly investigate such conditions and if it is found that the subsurface or concealed conditions are substantially different from those indicated in the Contract Documents, and then the Town will issue a Change Order or Change Directive. The Contractor shall not be entitled to an adjustment in Contract Price or the Completion Schedule if it is found that such conditions were adequately described in the Contract Documents or reasonably apparent or represented by the Town prior to the close of the Tender Period.
- d) If the Contractor fails to notify the Town of any substantial difference in site conditions as required in Article 4.7a), the Town may not authorize a change to the Contract Price and the Contractor shall be solely responsible for any

increased cost or delay that is associated with the substantial difference in site conditions.

4.9 Inspection of the Work

- a) The Town shall be entitled to access the Site for inspection at all times. The Contractor shall provide to the Town proper facilities for such access and inspection. Any such inspection will be directed toward providing assurance that the performance of the Work conforms to the requirements of the Contract Documents.
- b) The Contractor shall, upon request, provide the Town with any reasonable help which they may require at any time in the inspection of the Work. No specific payment will be made to the Contractor for such Work or assistance given.
- c) If the Specifications, Field Orders, Change Orders, or an Applicable Law requires any portion of the Work to be specially tested or approved, the Contractor shall give the inspecting authority timely notice when that portion of the Work is ready for inspection. Inspection by the Town shall be promptly made. If the inspection is by an authority other than the Town, the Contractor shall provide notification to the Town of the date and time fixed for the inspection.
- d) If any portion of the Work requiring inspection is covered up without inspection, the Contractor shall, if required by the Town, uncover that portion of the Work for inspection by the Town or relevant inspecting authority at the Contractor's expense.
- e) The Contractor shall promptly furnish two (2) copies of all certificates and inspection reports related to the Work to the Town.
- f) No portion of the Work shall be covered until the Town has completed inspection. In the event that a portion of the Work is covered prior to the Town's complete examination of such, the Contractor shall pay the costs of uncovering, examination, and reinstatement.
- g) Any inspection, testing, or witnessing of any of the Work or tests by the Town or any other applicable inspecting authority, or omission or failure on the part of the Town or any other applicable inspecting authority to inspect or test any of the Work shall not be construed to be an acceptance of any such Work or as relieving the Contractor of its responsibilities pursuant to this Contract or otherwise.

4.10 Rejected Work

- a) The Contractor will be notified of any portion of the Work that the Town has determined does not conform to the Contract, regardless of cause.
- b) The Contractor shall promptly remove from the Site and replace or re-execute defective work that has been rejected by the Town as failing to conform to the Contract Documents, whether or not the defective work has been incorporated into the Work and whether or not the defect is the result of poor workmanship, use of defective products, or damage through carelessness, or other act or omission of the Contractor.

- c) The Contractor shall, at the Contractor's sole expense, rectify the rejected work within the timeframe required by the Town. The Contractor shall be responsible for the costs of any re-testing or inspections required with respect to rectifying rejected work.
- d) If the Contractor does not rectify the rejected work within the timeframe required, the Town may replace such Work in accordance with Article 7.1 – Town's Right to do Work.
- e) The Contractor shall be responsible for any costs or expenses incurred in repairing or redoing the work of Other Contractors destroyed or damaged by the rectification.
- f) If, in the opinion of the Town, it is not expedient to correct rejected work, the Town may deduct from the Contract Price the difference in value between the work as done and that called for in the Contract, the amount of which shall be determined by the Town.

4.11 Cleaning Up

The Contractor shall at all times maintain the Site free from accumulation of waste material and debris. At the completion of the Work, the Contractor shall remove unwanted and unused material, tools, and equipment from the Site and leave the Site clean. The Town may remove unwanted or unused material, tools, and equipment left at the Site after completion of the Work and charge the cost of such removal to the Contractor.

4.12 Force Majeure

- a) Either the Town or Contractor may claim that an Event of Force Majeure has taken place, by giving the other party verbal notice within 24 hours of the Event of Force Majeure, and notice, together with a proposed plan of corrective action, in writing to resolve or minimize the effect of the Event of Force Majeure, within 48 hours of the Event of Force Majeure.
- b) If the Town has given notice of an Event of Force Majeure or agrees with the Contractor that the Work or any portion thereof is affected as a result of an Event of Force Majeure, then the Town shall:
 - i) Cause the Contractor to complete the Work, with such adjustments to Completion Schedule as are required by the Event of Force Majeure;
 - ii) Suspend the Work or any portion thereof in accordance with Article 7.2 – Town's Right to Stop Work or Terminate Contract; or
 - iii) Terminate this Contract or any portion thereof in accordance with Article 7.2 - Town's Right to Stop Work or Terminate Contract.
- c) If the Town does not agree that the Work or any portion thereof is affected as a result of an Event of Force Majeure for which the Contractor has given notice under Article 4.12a), then the Contractor shall complete the Work in accordance with the Completion Schedule and may request an adjustment to the Contract Price and Completion Schedule in the manner provided in Article 6.1d).
- d) If an Event of Force Majeure exists and continues for a period in excess of forty-five (45) days and results in a substantial portion of the Work being stopped or

suspended during that period, the Contractor may terminate the Contract and the Town shall pay the Contractor for the Work performed to the date of termination.

- e) Any delay or failure on the part of either the Town or the Contractor, which is a result of an Event of Force Majeure, shall not constitute default hereunder or give rise to any claim for damages. Subject to Article 4.12d), an Event of Force Majeure shall not result in any increase to the Contract Price.

4.13 Delays

- a) If the Contractor is delayed in the performance of the Work by an act or omission of the Town or anyone employed or engaged by the Town directly or indirectly, contrary to the provisions of the Contract Documents, or by the Town taking possession of or using any partially completed portion of the Work pursuant to Article 4.20 – Use of Completed Portions ahead of the Completion Schedule, then the Completion Schedule shall be extended for such reasonable time as may be necessary to allow the Contractor to make up the delay. The Contractor shall be reimbursed by the Town for reasonable costs incurred by the Contractor as the result of such delay.
- b) If the Contractor is delayed in the performance of the Work by an order issued by a court or other public authority having jurisdiction, and providing that such order was not issued as the result of an act or fault of the Contractor or any person employed or engaged by the Contractor directly or indirectly, then the Completion Schedule shall be extended for such reasonable time as the Town may recommend in consultation with the Contractor. The Contractor shall be reimbursed by the Town for reasonable costs incurred by the Contractor as the result of such delay.
- c) No claim for delay and no extension of time on account of delay shall be made for delay unless notice with a Change Quotation is given to the Town not later than ten (10) days after the commencement of delay, providing however, that in the case of a continuing cause of delay, only one notice of claim shall be necessary.
- d) The Contractor acknowledges that any delays in the Completion Schedule for the Work or portions of the Work may cause delays in the work of Other Contractors. The Contractor will be responsible for any claims from Other Contractors relating to such delays if they are the result of the Contractor's action or inaction.

4.14 Delay Costs

- a) As time is of the essence in this Contract, the Town may incur additional administration costs and expenses ("Overhead Costs") and engineering costs and expenses ("Engineering Costs") if the Contractor has not completed the Work by the Completion Date. Overhead Costs will consist of Town personnel costs associated with the delay, in an amount determined by the Town, and any additional costs or loss of revenue incurred by the Town due to the delay. Engineering Costs will consist of personnel costs and expenses incurred by the Engineer associated with the delay.
- b) The Contractor will be required to pay the Overhead Costs and Engineering Costs if the Contractor fails to complete the Work by the Completion Date. The Town may set off these Overhead Costs and Engineering Costs from any

amounts due the Contractor. This right is in addition to any other right or remedy the Town may have in law or equity with respect to the Contractor.

4.15 Completion Schedule

- a) The Contractor shall submit a detailed Completion Schedule, in critical path method format showing all of the principal portions and phases of the Work, upon award of the Contract and at least ten (10) days prior to the commencement of the Work. No Progress Payment Certificate shall be processed until the Town has received an acceptable Completion Schedule.
- b) The Contractor shall update the Completion Schedule monthly against the actual progress of the Work.
- c) If, in the opinion of the Town, any Completion Schedule is inadequate as a control tool or if it does not show the Work being fully completed by the Completion Date, it may be rejected and the Contractor shall be required to provide a Completion Schedule and work program that is acceptable to the Town.
- d) No action or conduct of the Town in monitoring, reviewing, or reporting upon the progress of the Work shall relieve the Contractor of the sole responsibility for planning and managing the Work.

4.16 Contractor's Work Plan

The Contractor shall submit a detailed work plan, accurately and comprehensively describing the Contractor's method and approach to performing the Work, to the Town for review at least ten (10) days prior to commencing the Work.

4.17 Work on Roads

Where performance of the Work requires work on roads:

- a) Where possible, any work to be done within road intersections shall be done at a time of least disruption to traffic, such as off-peak hours, which may include a time period such as early evening or early morning.
- b) No road shall be closed, in whole or in part, for any amount of time, unless written approval is issued by the Town.
- c) A signage/traffic management plan must be submitted to the Town for review and approval at least ten (10) days prior to work commencing in this regard. Where the road to be worked is a transit route, the Contractor shall include details regarding accommodation of buses in the management plan.
- d) Asphalt testing shall be coordinated by the Contractor through a testing company selected by the Contractor and approved by the Town.

4.18 Notifying Affected Parties

Where performance of the Work requires disruption to regular traffic patterns, property access, or utility service to the public:

- a) The Contractor shall notify all affected residents on collector and residential streets, in writing, at least 48 hours in advance prior to any work commencing on

site and prior to any disruption of traffic, access, or utility service to property. Notice shall include the name and phone number of the Contractor's representative.

- b) For all work on arterial roadways, the Contractor shall place notices in the local paper and shall place appropriate signage on all adjoining roads ten (10) days prior to commencing work.
- c) The cost of notification shall be deemed incidental to the Work and no separate payment shall be made.
- d) A copy of all applicable notices shall be provided to the Town for review at least five (5) days in advance of work commencing in this regard.

4.19 Allowable Working Hours on the Site

- a) Allowable working hours within Town limits are from 7:00 AM to 10:00 PM, Monday through Saturdays and Sundays & Holidays between 10:00 AM and 7:00 PM, in accordance with the Town of Edson Community Standards Bylaw 2218.
- b) Special permission may be considered by the Town to allow work after-hours, on Sundays, or on Statutory Holidays if requested by the Contractor. Such permission must be requested at least forty-eight (48) hours in advance unless in the event of an emergency. In either case, the Town must be contacted immediately. Such permission shall consist of written communication from the Town. In such cases, the Town may require the Contractor to provide special notification to affected parties, specifically where traffic or noise implications risk public disturbance.

4.20 Use of Completed Portions

- a) The Town reserves the right to take possession of and use any completed or partially completed portion of the Work, notwithstanding that the Completion Schedule may not have expired, but such possession and use shall not be deemed an acknowledgement or acceptance of completion of any portion of the Work that does not conform to the Contract. If such use of completed portions of the Work delays the Completion Schedule of the Work, then the Completion Schedule shall be extended for such reasonable time as the Town may decide and shall be confirmed through issuance of a Change Order.

5.0 PAYMENTS AND CERTIFICATES

5.1 Applicable Taxes

- a) All references to costs, expenses, and payments in the Contract Documents shall be considered to include any G.S.T., other applicable federal, provincial, and municipal taxes, or other noted taxes associated with such costs, expenses, or payments unless noted otherwise.
- b) In each application for payment, the Contractor shall indicate the G.S.T. as a separate amount calculated on the net Contract Price payable on that application, that is, the accrued Contract Price less holdback amount and less the total of previous payment. The G.S.T. on the holdback will be payable together with the release of the holdback.

- c) The Contractor shall be responsible for the payment of:
 - i) All taxes imposed by reason of the performance or completion of the Work including but not limited to license, permit, and registration fees, and the Contractor's income, profit, franchise, business, and personal property taxes;
 - ii) All employment taxes and contributions imposed by Applicable Laws or required to be paid on behalf of the employees of the Contractor, Subcontractors, or suppliers, including, but not limited to, taxes and contributions for income tax, workers' compensation, unemployment insurance, old age benefits, welfare funds, pensions and annuities, and disability insurance; and
 - iii) All customs, sales, and excise taxes and duties owing with respect to any labour, machinery, materials, and equipment supplied by the Contractor for use in the performance of, or to be incorporated into, the Work, except for goods and services tax payable by the Town with respect to payments due to the Contractor.
- d) Any increase in taxes and charges described in Articles 5.1c)i) and 5.1c)ii) shall be the sole responsibility of the Contractor. In the event of a change in taxes or charges described in Article 5.1c)iii), a Change Order shall be issued changing the Contract Price to account for the difference between the amount of tax that would have been payable by the Contractor as of the effective date of this Contract and the actual amount of tax that becomes payable as a result of the change in the tax.
- e) The Contractor shall indemnify and hold harmless the Town from any liability resulting from the Contractor's, Subcontractors', or suppliers' failure to make timely payments of the items referred to in Article 5.1 – Applicable Taxes, or such similar items for which the Contractor is responsible. Any interest, penalties, or other liabilities arising from such failure shall be the sole responsibility of, and be paid for by, the Contractor.

5.2 Applications for Progress Payment

- a) Applications for progress payment may be made monthly, as the Work progresses, for the value of Work performed and products incorporated into the Work to a date agreed to between the Town and the Contractor.
- b) Where payment is on the basis on a lump sum price as indicated in the Tender Form, the Contractor shall, before the first application for payment, submit to the Town a schedule of values and projected cash flow for the various portions of the Work. The schedule shall provide a breakdown of the total Contract Price, divided so as to facilitate evaluation of progress claims based on portions or phases of the Work, and be made out in a form and supported by evidence as the Town may direct.
- c) Where payment is on the basis of unit prices as indicated in the Tender Form, the Contractor shall, before the first application for payment, submit to the Town a projected cash flow aggregating the total Contract Price.
- d) Each application for payment shall be accompanied by:

- i) A statement of amounts claimed based on the schedule of values, including any authorized change, if payment is on the basis of a lump sum price as indicated in the Tender Form;
- ii) A schedule of work units duly measured and accepted by the Town and valued at the applicable unit prices, including any authorized change, if payment is on the basis of unit prices as indicated in the Tender Form;
- iii) An updated cash flow projection;
- iv) Such evidence as the Town may direct showing the Contractor's entitlement to the payment claimed;
- v) Notification of any liability which may fall upon the Town if not paid for by the Contractor;
- vi) A sworn statement, or statutory declaration, that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred by the Contractor in the performance of the Work and for which the Town might in any way be held responsible, have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute;
- vii) A Letter of Clearance from the Workers' Compensation Board current to the date of the application for payment; and
- viii) Written confirmation that the Contractor has no other claim, including overhead, impact costs, loss, or damages arising from the Work completed as of the date of the application for payment.
- ix) An updated Completion Schedule in accordance with Article 4.15.
- e) The Town will, within twenty (20) days of receiving an application for payment, approve the payment, or advise the Contractor promptly in writing as to why the payment is amended or rejected.
- f) Each application for payment shall become due and payable by the Town within ten (10) days of approval.
- g) Each Progress Payment Certificate shall be determined as the accrued amount approved less the holdback amount as defined in Article 5.3 – Holdbacks, less the total of previous approved payments.
- h) The Contractor shall at all times reimburse, protect, indemnify, and save free and harmless the Town, the Site, and the other lands and property of the Town from and against all liens, claims made, or liability incurred by the Contractor on account of the Work performed or materials supplied by Subcontractors or suppliers, or on account of an exaggerated lien filed by the Contractor including, without limitation, legal fees on a solicitor and own client (indemnity) basis. The Contractor shall cause any such lien or claim which may be filed or made, to be released and discharged forthwith at the expense of the Contractor. If the Contractor fails to release or obtain the release and discharge any such lien or claim, then the Town may, but shall not be obliged to, discharge, release or otherwise deal with the lien or claim, and the Contractor shall pay any and all costs and expenses incurred by the Town in so releasing, discharging or otherwise dealing with the claim or lien, including but not limited to, legal fees on

a solicitor and own client (indemnity) basis. Any amounts so paid by the Town may be deducted from any amounts due the Contractor whether under this Contract or otherwise.

- i) No payment shall be made if any lien or charge is filed in respect to the Work performed or Products furnished under the Contract. The Town shall not be obligated to make further payments until the Contractor provides evidence that the Work is clear of Builders' Liens and any other charges arising out of the Contractor's execution of the Work.
- j) The Town may review its records with respect to business licensing, taxation, assessment, and other accounts receivables prior to making any payment to the Contractor. The Town may set off any overdue accounts owed by the Contractor to the Town against any amounts otherwise payable to the Contractor pursuant to the Contract.

5.3 Holdbacks

- a) The Town shall be entitled to holdback an amount from payments as may be required by the Prompt Payment and Construction Lien Act – Alberta, or any other Applicable Law.
- b) If the Applicable Laws do not require that the Town maintain a holdback, the Town will maintain a holdback as follows:
 - i) 10% of the accrued amount approved will be withheld until 50% of the value of the Work is completed; and
 - ii) 5% of the accrued amount approved will be withheld until the issuance of a Construction Completion Certificate by the Town.
- c) In addition to the foregoing, the Town shall have the right to retain an additional holdback to the extent necessary to protect the Town from loss on the account of one or more of the following:
 - i) The Contractor, in the opinion of the Town, is not making satisfactory progress;
 - ii) Rejected work has not been remedied;
 - iii) Claims relating to the Work filed, or reasonable evidence in the opinion of the Town indicating probable filing of claims;
 - iv) Evidence of failure of the Contractor to make payment to Subcontractors for Products or labour; or
 - v) Damage to Other Contractors or the work of Other Contractors.

5.4 Substantial Completion Certificate

- a) When the Contractor is of the opinion that the Contract is substantially completed as defined by the Prompt Payment and Construction Lien Act – Alberta, the Contractor may apply for a Substantial Completion Certificate to the Town with respect to the Contract.
- b) Where the Contractor and a Subcontractor are of the opinion that the Subcontractor's portion of the Work is substantially complete, the Contractor may

apply for a Substantial Completion Certificate to the Town covering the portion of the Work substantially completed by the Subcontractor. The Contractor and Subcontractor shall duly sign this application. The Contractor shall ensure that such portion of the Work is protected until the issuance of the Construction Completion Certificate, and shall be responsible for any defects or outstanding work regardless of whether or not such was apparent when the Substantial Completion Certificate for that portion of the Work was issued.

- c) The Substantial Completion Certificate application delivered to the Town shall list any outstanding deficiencies or other work items, dates for the corrections and completions, and the value of the Work remaining to be completed. Failure to include an item on the list does not alter the responsibility of the Contractor to complete the Work in accordance with the Contract Documents.
- d) Within fifteen (15) days following receipt of the Contractor's Substantial Completion Certificate application, the Town will review the Work to verify the validity of the application. The Town will notify the Contractor whether the Work or designated portion of the Work is substantially performed.
- e) If the Town verifies the Work to be substantially completed, the Town will issue a Substantial Completion Certificate to the Contractor. The certificate will indicate the date of substantial completion of the Work or portion of the Work.
- f) If the Town issues a Substantial Completion Certificate, the Contractor shall, within three (3) days from the date of such issuance, post the certificate on the Site as required by the Prompt Payment and Construction Lien Act – Alberta.

5.5 Construction Completion Certificate

- a) When the Town is satisfied that the Work has been completed, all deficiencies have been corrected, and the Contractor has delivered to the Town all required documentation relating to the Work and required under the Contract, the Town will issue a Construction Completion Certificate to the Contractor.

5.6 Release of Holdback

- a) The Contractor shall submit to the Town, following the issuance of the Substantial Completion Certificate or Construction Completion Certificate, an application for release of holdback accompanied by:
 - i) A statement of the amount claimed;
 - ii) A certificate from the Workers' Compensation Board, dated after the date of issuance of the Substantial Completion Certificate or Construction Completion Certificate, verifying that assessment dues from the Contractor and Subcontractors have been paid;
 - iii) A sworn statement, or statutory declaration, dated after the issuance date of the Substantial Completion Certificate or Construction Completion Certificate, that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred by the Contractor in the performance of the Work and for which the Town might in any way be held responsible, have been paid in full;

- iv) Such reasonable evidence as the Town may require showing the Contractor's entitlement to the payment claimed; and
- v) A declaration that the Contractor has no other claim arising from the Work, including overhead, impact costs, loss or damages.
- b) The Town will commence approval for payment of the appropriate holdback amount sixty (60) days after the date the Town receives the Substantial Completion Certificate or issues the Construction Completion Certificate. The sums included on this Release of Holdback Certificate shall constitute Final Payment under the Contract.

5.7 Warranty

- a) The Contractor warrants that the Work is and shall be free from any and all defects and deficiencies in workmanship performed, and materials and equipment supplied, by the Contractor, its Subcontractors, or suppliers for a period of:
 - 24 months for underground services and utilities,
 - 24 months for uniform fencing,
 - 24 months for roads, sidewalks, curbs, and gutters,
 - 24 months for trees and shrubs, and
 - 24 months for grass and sodfrom the date of the Construction Completion Certificate, or such other period as provided in Section 00 73 00 – Supplementary Conditions.
- b) The Town will give notice to the Contractor of any observed defects to the Work within the Warranty Period.
- c) The Contractor shall promptly correct, at the Contractor's expense and to the satisfaction of the Town, any defects observed in the Work during the Warranty Period. The Contractor shall pay for any damage to other work as the result of defects in the Work that arise during the Warranty Period.
- d) If an Applicable Law or Product warranty extends the liability for faulty Products or workmanship beyond the Warranty Period, then the provisions of the Applicable Law or Product warranty shall apply.
- e) Any extended warranties required beyond the applicable Warranty Period, as described in Article 5.7a) or stipulated in Section 00 73 00 – Supplementary Conditions, shall be as specified in the Contract Documents. Extended warranties shall be issued by the warrantor to the benefit of the Town. The Contractor's responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibility of the warrantor.
- f) If, in the opinion of the Town, an observed defect requires immediate correction during the Warranty period, the Town may perform the correction or cause the correction to be performed by others and the Contractor shall be liable to reimburse the Town for any costs incurred as a result of the correction.

5.8 Liability for Landscaping, Trees, and Shrubs Under Warranty

- a) If the Work includes soft landscaping, the Contractor shall follow the maintenance standards provided in the Contract Documents or applicable Town standards. The Contractor will maintain soft landscaping including all turf, trees, and shrubs during the Warranty Period.
- b) The Contractor acknowledges that proper maintenance will reduce, but never eliminate, the chance that a tree or shrub might die or be damaged through Natural Causes. Natural Causes includes diseases, pests, climatic stress, and any other cause in which human beings are not the main culprits.
- c) The Contractor acknowledges that, if a tree or shrub dies or is damaged through Natural Causes, it is very difficult to prove whether the result could have been prevented by proper maintenance. In order to avoid problems of proof of causation and to ensure that the Contractor has an incentive to properly maintain the trees and shrubs, the Contractor shall be liable for all death or damage to trees and shrubs due to Natural Causes.
- d) The Contractor shall not be liable for the death or damage to trees or shrubs if caused directly by human intervention not resulting from the act or inaction of the Contractor, its employees, agents, or Subcontractors. This may include, but is not limited to, vandalism, vehicle accidents, construction accidents, flooding caused by human activities on or near the Site, chemical contamination, and accidents during maintenance by the Town.
- e) The onus shall be on the Contractor to prove that the death or damage of a tree or shrub was not as a result of Natural Causes.

5.9 Final Acceptance Certificate

Thirty (30) days prior to the expiration of the Warranty Period, the Contractor shall apply to the Town for a Final Acceptance Certificate. The Town shall issue a Final Acceptance Certificate to the Contractor if all observed defects in the Work have been corrected to the satisfaction of the Town. In the event that all observed defects have not been corrected to the Town's satisfaction, the Warranty Period shall remain in effect and the Final Acceptance Certificate shall not be issued until all observed defects have been corrected to the satisfaction of the Town.

5.10 Non-Waiver of Responsibility

- a) Notwithstanding any other term of the Contract, no certificate, payment, or waiver of claims shall relieve the Contractor from liability arising out of the Contractor's failure to comply with the Contract.
- b) No approval of payment, payment, nor any partial or entire use or occupancy of the Work by the Town shall constitute acceptance of the Work or Products which are not in accordance with the Contract Documents.

5.11 Audits

- a) The Town may audit all accounts of the Contractor relating to the Work including, without limitation, timesheets, all reimbursable out-of-pocket expenses, and costs for materials, goods, and equipment claimed by the Contractor.

- b) The Contractor shall, at all times during the term of the Contract and for a period of six (6) years after the end of the Contract, keep and maintain records of the Work performed in accordance with this Contract. This shall include proper records of quotations, contracts, correspondence, invoices, vouchers, and timesheets. The Contractor shall make these records available for inspection by the Town at all reasonable times.

5.12 Electronic Payment

- a) Whenever the Town is obligated to make a payment to the Contractor under the Contract, the Town may, at the Town's sole discretion, transfer funds electronically from the Town directly to the Contractor's account at a financial institution, henceforth referred to as an Electronic Fund Transfer (EFT).
- b) If the Town gives the Contractor notice in writing of the Town's intention to use an EFT, the Contractor shall provide the Town with all information that the Town may reasonably require to carry out an EFT, including the name and address of the Contractor's financial institution and the appropriate account information.
- c) The Town shall keep all such information strictly confidential and will only use it for the purpose of carrying an EFT.

6.0 CHANGES

6.1 General

- a) The Town shall have the right, at any time, to make Changes.
- b) The Town may, without invalidating the Contract, make:
 - i) Changes in the Work consisting of additional, deletions, or other revisions by Change Order or Change Directive, and
 - ii) Changes to the Completion Schedule for the Work by Change Order.
- c) The Contractor shall not perform a change in the Work without a Change Order or Change Directive.
- d) If, during the performance of the Work, the Contractor is of the opinion that any instruction, interpretation, decision, or direction from the Town should have, but has not, resulted in a Contemplated Change Notice or Change Directive being issued, the Contractor shall give the Town ten (10) days notice with a Change Quotation requesting any adjustment in the Contract Price and Completion Schedule required. The Town shall promptly consider the Change Quotation and immediately issue a Change Order, Change Directive, or advise the Contractor that the Contractor's request is denied.

6.2 Change Order

- a) The Town will issue a Contemplated Change Notice to the Contractor when a change in the Work or Completion Schedule is proposed or required.
- b) The Contractor shall provide a Change Quotation to the Town, adequately detailing a method or amount of adjustment of the Contract Price, if any, and the adjustment in the Completion Schedule, if any, for the proposed change.

- c) The method of adjustment of the Contract Price shall be in accordance with Article 6.4.
- d) Upon receipt and acceptance of a Change Quotation by the Town, the Town will issue a Change Order which shall be duly signed by the Town and the Contractor. Where a Change Order includes a change in the value of the Contract Price, such change shall be reflected in subsequent progress payment applications.

6.3 Change Directive

- a) In the event that the Town requires the Contractor to proceed with a Change prior to the Town and the Contractor meeting an agreement on an adjustment in Contract Price or the Completion Schedule, the Town shall issue a Change Directive.
- b) A Change Directive shall only be issued to direct a Change that is within the general scope of the Contract Documents.
- c) Upon receipt of the Change Directive, the Contractor shall promptly proceed with the Change.
- d) The adjustment in Contract Price under a Change Directive shall be determined in accordance with Article 6.4, unless otherwise stipulated in the Supplementary Conditions.
- e) If a Change Directive results in cost savings, the Contractor shall credit the Town in the amount of actual cost savings to the Contractor, without deduction for overhead or profit.
- f) Pending determination of the final amount of a Change Directive, the undisputed value of the work performed under the Change Directive is eligible to be included in progress payments.
- g) At such a time that the Town and the Contractor reach an agreement on the adjustment in Contract Price and Completion Schedule for work performed under a Change Directive, such agreement shall be recorded in a Change Order duly signed by the Town and the Contractor.

6.4 Valuation of Change

- a) The value of any change in the Work shall be determined in one or more of the following ways:
 - i) By unit prices indicated in the Tender Form or, if unit prices indicated in the Tender Form are not directly applicable, by deduced or extrapolated unit prices from those indicated in the Tender;
 - ii) By estimate and acceptance in a lump sum;
 - iii) By cost plus percentage;
 - iv) By cost plus fixed fee;
 - v) As provided for in the Supplementary Conditions; or
 - vi) If none of the above methods can be used, by alternative dispute resolution as set out in Article 8.0 – Disputes.

The value of the Change, calculated in accordance with any manner contemplated in this article, shall include all costs, expenses, overhead, impact costs, loss, or damages associated with the Change.

- b) When the Town orders a change to the Work which requires extra work and it is performed by the Contractor's own forces and valued under Article 6.4a)iii), the Town will pay only for labour, materials, and equipment directly used in the extra work plus mark-ups in accordance with the following table:

Labour:	Labour rates accepted by the Town plus 10% for profit.
Materials:	Actual cost plus 10% overhead allowance, plus 10% for profit.
Equipment:	At rental rates provided by the Alberta Roadbuilders and Heavy Construction Association (ARHCA) Equipment Rental Rates or other similar trade association approved by the Town, for the time when equipment is in use. There shall be no mark-ups on these rates.
Transport:	Transport of equipment will only be allowed if the equipment is not already present at the Site. Transport rates will be based on ARHCA Equipment Rental Rates.
Small tools:	Included in the labour rate. No separate payment shall be made.
Equipment not owned by the Contractor and not covered by ARHCA Equipment Rental Rates:	Actual rental cost plus 10% for overhead and 5% for profit.

- c) For the purpose of Article 6.4b), the labour rates shall be based on those included with the Tender submittal and shall include only the actual wage paid to the employee, plus the payroll burden, plus an overhead allowance of 15%. The payroll burden shall consist of the Contractor's required payment for the Canada Pension Plan, Employment Insurance, Workers' Compensation, employee pension plans, vacation allowance, medical benefits, and any other payments required by law.
- d) If requested by the Town, the Contractor shall provide a detailed breakdown of the proposed labour rates clearly demonstrating how the make-up of the rate conforms to Article 6.4b) and 6.4c). The Town may audit labour rates to ensure compliance.
- e) Unless agreed to in writing by the Town, all extra work will be valued based on regular hourly labour rates.
- f) The Town will not pay for vehicles used to transport workers or for travel time for workers to and from the Site.
- g) For each day on which extra work has been carried out or materials have been supplied, the Contractor shall, within twenty-four (24) hours, submit a statement of labour and equipment time incurred for the extra work to the Town.

- h) When a Subcontractor performs the extra work and the payment to the Contractor is on a cost plus percentage basis, the Town will pay the Contractor:
 - i) An amount equal to the Subcontractor's costs for labour, materials, and equipment used for the extra work, provided that the rates, overhead allowance, and profits do not exceed those outlined in Article 6.4b); and
 - ii) A mark-up for overhead allowance and profit, not exceeding 10%, on the Subcontractor's price for the extra work. This mark-up shall take into account all additional costs excluding approved supervision, required to ensure that the Subcontractor undertakes the extra work in accordance with the Contract.

6.5 Quantity Variation

- a) The Town or the Contractor may request an adjustment to a unit price contained in a Schedule of Prices included in the Tender Form provided that the actual quantity of the item in the Schedule of Prices exceeds or falls short of the estimated quantity by more than 15%.
- b) Where the actual quantity exceeds the estimated quantity by more than 15%, a unit price adjustment shall apply only to the quantity that exceeds 115% of the estimated quantity.
- c) Where the actual quantity falls short of the estimated quantity by more than 15%, a unit price adjustment shall not exceed the unit price that would cause the extended amount to equal the original extended amount derived from the original unit price and estimated quantity.
- d) Without limiting Article 6.5a), if either party requests adjustment of a unit price, both parties shall make all reasonable efforts to agree on a revised unit price. The agreed revised unit price shall be recorded in a Change Order.
- e) If agreement on a revised unit price is not reached, the matter shall be subject to final determination in accordance with Article 8.0 – Disputes. Pending determination of the revised Unit Price, payment for the Work performed shall be included in progress payments based on the original unit price.

7.0 RIGHTS AND REMEDIES

7.1 Town's Right to do Work

- a) If the Contractor neglects to perform the Work properly, or fails to comply with any provision of the Contract, the Town may provide written notice to the Contractor that the Contractor is in default of obligations under the Contract. The Town will instruct the Contractor to correct the default within five (5) days of receiving the notice.
- b) If correction of the default cannot be completed within the five (5) days specified, the Contractor will be considered to be in compliance with the Town's instructions if the Contractor:
 - i) Commences correction of the default within the specified time;

- ii) Provides the Town with a schedule for the correction which is acceptable to the Town; and
 - iii) Completes the correction in accordance with the schedule submitted.
- c) If the Contractor fails to correct the default as herein required, the Town may, without prejudice to any other right or remedy the Town may have, correct such default and deduct the cost of the correction from any payment due to the Contractor.

7.2 Town's Right to Stop Work or Terminate Contract

- a) The Town has the general and absolute right, upon providing written notice to the Contractor, to terminate the Work at any time and pay the Contractor for all work completed until the point of termination.
- b) If the Contractor:
 - i) Should be adjudged bankrupt;
 - ii) Makes a general assignment for the benefit of creditors on account of the Contractor's insolvency;
 - iii) Acknowledges insolvency, bankruptcy, or liquidation;
 - iv) Ceases to carry on business; or
 - v) If a receiver is appointed on account of the Contractor's insolvency;The Town may, without prejudice to any other right or remedy the Town may have, terminate the Contract upon providing written notice to the Contractor.
- c) Should the Contractor be in default of any obligation provided under the Contract, the Town may provide written notice to the Contractor that the Contractor is in default.
- d) Written notice from the Town will instruct the Contractor to correct the default within five (5) days of receiving the notice.
- e) If correction of the default cannot be completed within the five (5) days specified, the Contractor will be considered to be in compliance with the Town's instructions if the Contractor:
 - i) Commences correction of the default within the specified time;
 - ii) Provides the Town with a schedule for the correction which is acceptable to the Town; and
 - iii) Completes the correction in accordance with the schedule submitted.
- f) If the Contractor fails to correct the default as herein required, the Town may, without prejudice to any other right or remedy the Town may have, stop the Work or terminate the Contract.
- g) If the Town terminates the Contract pursuant to Article 7.2b) or 7.2f), the Town is entitled to:
 - i) Take possession of the Site and Products and utilize the construction machinery and equipment, subject to the rights of third parties, and to finish the Work by whatever method the Town may deem expedient;

- ii) Withhold any further payments to the Contractor until the Work is completed;
 - iii) Upon final completion of the Work, charge the Contractor the amount by which the cost for completing the Work exceeds the unpaid balance of the Contract Price or, if such cost for completing the Work is less than the unpaid balance of the Contract Price, pay the Contractor the difference;
 - iv) Maintain a reasonable holdback during the Warranty Period which represents the Town's estimate of costs for repair of Work during the Warranty Period; and
 - v) On expiry of the Warranty Period, charge the Contractor the amount by which the cost of corrections during the Warranty Period exceeds the holdback allowance, if any, provided for such corrections, or, if the cost of such corrections is less than the holdback allowance, pay the Contractor the difference.
- h) The Contractor's obligations under the Contract as to quality, correction, and warranty of the work performed by the Contractor up to the time of termination shall continue in force after such termination.

7.3 Contractor's Right to Stop Work or Terminate Contract

- a) If the Work should be stopped or otherwise delayed for a period of time of forty-five (45) days or more under an order of any court or other public authority, and providing that such order was not issued as the result of any act or fault of the Contractor or of anyone directly or indirectly employed by the Contractor, the Contractor, without prejudice to any other right or remedy the Contractor may have, may terminate the Contract by providing the Town written notification.
- b) If the Town should, within ninety (90) days, fail to pay any sum approved by the Town or awarded by the Referee or Arbitrator to the Contractor, then the Contractor may, upon five (5) days written notice to the Town, stop the Work or terminate the Contract and recover from the Town any outstanding payments for Work completed.

8.0 DISPUTES

8.1 Negotiation

- a) The Contractor and the Town shall use their best efforts to resolve any disputes arising between them as efficiently and cost effectively as possible.
- b) At all relevant times, the Town and the Contractor shall:
 - i) Make bona fide efforts to resolve all disputes by amicable negotiations; and
 - ii) Provide frank, candid, and timely disclosure of all relevant facts, information, and documents to facilitate those negotiations.
- c) The Contractor and the Town agree that any efforts to resolve their dispute by amicable negotiation or with the assistance of a mediator, at any time during or after the performance of the Work, does not suspend the expiration of any time

limitation for taking any act under the Contract unless both parties have specifically agreed in writing to waive or vary such time requirement.

- d) Unless otherwise instructed by the Town in writing, the Contractor shall continue to perform the Work and maintain its progress during any proceedings under Article 8.0 – Disputes.
- e) Upon award of a contract, or at a later date, the Town shall identify three potential referees acceptable to the Town. The Contractor shall have ten (10) days from receipt of the Town’s notice to accept one of those referees or identify another Referee acceptable to the Contractor. If the Town is not in agreement with the Contractor’s alternate selection for Referee and an agreement cannot be reached on a potential referee, either party may apply to a court or to the Alberta Arbitration and Mediation Society to name a Referee.
- f) If the services of a Referee are required, the Town, Contractor, and Referee will enter into a Referee Services Agreement contract.
- g) Where the Referee is unable to perform the duties as required under the Referee Services Agreement and resigns or is removed by agreement of the parties, a new Referee shall be appointed in accordance with Article 8.1e).
- h) All disputes arising out of or in connection with the Contract, or in respect of any defined legal relationship associated with it or derived from it, shall be referred to and finally resolved in accordance with the provisions of Article 8.3 – Referee’s Review, Article 8.5 – Arbitration, and the Rules of Arbitral Procedure, attached to the General Conditions as Schedule A.

8.2 Notice of Dispute

- a) If the Town provides written notification with reasons of any decision required under the Contract, then the Contractor shall be deemed to have accepted the Town’s decision as final and binding unless the Contractor provides written notice of dispute to the Town within five (5) days after receiving the notification from the Town.
- b) If the Contractor has given notice of a dispute to the Town under Article 8.2a) in respect of any dispute arising with regard to the Contract, the notice of dispute and the Town’s decision shall be referred to a Referee for review pursuant to Article 8.3 – Referee’s Review.

8.3 Referee’s Review

- a) If the Contractor has issued notice of dispute to the Town within the time provided in Article 8.2a), any decision of the Referee is final and binding on the parties unless the decision is referred to arbitration as provided in Article 8.5a).
- b) Within five (5) days of notification to the Contractor and the Town from the Referee that the Referee is prepared to commence the review, the Contractor shall deliver to the Referee and the Town:
 - i) A written summary of the facts, information, and arguments; and
 - ii) Copies of all documents relating to the Contract, upon which the Contractor tends to rely.

- c) Within five (5) days after the Town receives the Contractor's submissions, as required in Article 8.3b), the Town shall deliver to the Referee and the Contractor:
 - i) A written summary of the facts, information, and arguments; and
 - ii) Copies of all documents relating to the Contract, upon which the Town tends to rely.
- d) Within five (5) days of receiving the Town's submissions, the Contractor shall have the opportunity to retract its referral to the Referee prior to the Referee giving a determination on the matter. In this instance, the Contractor may be responsible for any costs and expenses incurred at the Referee's discretion.
- e) The Referee may:
 - i) Require the Town or the Contractor to provide further written explanations or documentation considered necessary, giving each party an opportunity to respond to them;
 - ii) On written application by the Town or the Contractor made before a determination is made, allow the Town or the Contractor to submit additional written information or documentation which was not available when the submissions were made under Articles 8.3b) or 8.3c) and give each party an opportunity to respond to the additional submission; and
 - iii) On written application by the Town or the Contractor, extend the time for making a submission under Article 8.3b) or 8.3c) in circumstances that the Referee may consider appropriate.
- f) The Referee shall conduct a review, without oral hearing, of the disputed decision of the Town, taking into account:
 - i) The Town's written decision and reasons given;
 - ii) The submissions of the Contractor and the Town provided under Articles 8.3b) or 8.3c);
 - iii) Any information obtained under Article 8.3e); and
 - iv) The terms of the Contract.
- g) Not later than twenty (20) days following the receipt of the last documentary submission, the Referee shall make a decision, and immediately provide the decision in writing to the Town and the Contractor, with reasons, which may confirm or vary the decision of the Town or substitute another decision. The decision of the Referee is final and binding on the parties unless the decision is referred to arbitration as provided in Article 8.5a).
- h) If the Town has made a decision which affects the schedule or time within which various portions or phases of the Work are to be completed, and the Referee determines that the Contractor ought to have been provided with more time, the Referee shall not make a decision varying or substituting the Town's decision respecting the schedule or time, but may make a decision respecting compensation required to be paid to the Contractor under the Contract.

8.4 Referee Costs

- a) The Town shall bear the costs, if any, of naming and retaining the Referee.
- b) The Town and the Contractor shall equally bear the costs and expenses of any review by the Referee.
- c) Without limiting the generality of Article 8.4b), the Referee may order that the costs and expenses of the review, including the costs and expenses of preparation of submissions by the Town or the Contractor, be paid by either the Town or the Contractor.

8.5 Arbitration

- a) By giving written notice to the other party not later than five (5) days after receipt of the Referee's decision, either party may refer the decision of the Referee to arbitration. Arbitration is mandatory in the event of a dispute with the Referee's decision.
- b) Unless otherwise agreed by the Town and the Contractor, all disputes under the Contract referred to arbitration under Article 8.5a) shall be held in abeyance until the Work has been completed, the Contract has been terminated, or the Contractor has abandoned the Work, whichever is earlier.
- c) Disputes under the Contract shall then be consolidated into a single arbitration before a single arbitrator under the Rules of Arbitral Procedure attached to the General Conditions as Schedule A.
- d) An arbitral award rendered under Article 8.5c) is final and binding on the Town and the Contractor, and there shall be no appeal to the courts.

9.0 PROTECTION OF WORK, PROPERTY, AND LIFE

9.1 Use of Premises and Overloading

- a) The Contractor shall confine equipment, storage, and operation areas to the limits indicated by Applicable Laws, permits, or by the direction of the Town and shall not unreasonably encumber the premises with Products, material, or equipment.
- b) The Contractor shall not load or permit to be loaded any portion of the Work with a weight that may endanger the safety of such portion of the Work.
- c) Where applicable, no portion of the Work shall be loaded after the pouring of concrete unless written approval is received from the Town.
- d) The Contractor shall comply with the direction of the Town regarding signs, advertisements, fires, smoking, sanitation, and storage of inflammable products.

9.2 Protection of Work, Property and Life

- a) The Contractor shall maintain, at the Contractor's expense, continuous and adequate protection of the Work from damage and shall protect the Town's property and adjacent property from damage caused in the performance of the Work. The Contractor shall, at the Contractor's expense, make good any damage

to the Work, the Town's property, or adjacent property arising from the performance of the Work.

- b) The Contractor shall not be responsible for any damage to the Work, the Town's property, or adjacent property where such damage occurs as the result of errors in the Contract Documents, or acts or omissions by the Town, its agents, representatives, or employees, or Other Contractors, provided the Contractor has implemented reasonable protective precautions. Where such damage occurs, the Contractor shall make good such damage to the Work and, if the Town so directs, to the Town's property or adjacent property. The Contract Price and Completion Schedule shall be adjusted as provided in Article 6.0 - Changes.
- c) The Contractor shall provide, erect, and maintain all hoarding, barricades, covered ways, guardrails, barriers, lighting, sidewalks, curbs, and other protection as may be necessary for the preservation of public health and safety, or as may be required by Applicable Laws.
- d) The Contractor shall supply and maintain at the Site sufficient facilities and equipment of the type and size suitable for extinguishing fires that may occur in the performance of the Work.
- e) The Contractor shall observe any instruction from the fire department with respect to fire hydrant access during performance of the Work. The Contractor shall inform the fire department of any activity that may hinder the fire department's access to any street or lane during the performance of the Work.

9.3 Construction Work at or Near Pipelines and Transmission Lines

- a) If the Work involves excavation or other construction activity near underground pipelines or transmission lines, the Contractor shall, in addition to accepting and receiving information supplied by the Town, take all measures necessary to locate any pipelines or transmission lines. The Contractor acknowledges that the Contractor is aware of all requirements under the Pipeline Act – Alberta. The Contractor shall comply with all requirements of the Pipeline Act, the pipeline crossing agreement, and any other reasonable direction from the Town.
- b) Without limiting the generality of Article 9.3a), if, in performance of the Work, contact is made with a pipeline or transmission line, resulting in a puncture of or a crack in the pipeline or transmission line, the Contractor shall:
 - i) Immediately stop the activity;
 - ii) Immediately phone 911 and give the name of the pipeline or transmission line and location of activity;
 - iii) Immediately advise the pipeline or transmission line company; and
 - iv) Not resume any construction activity without the approval of the pipeline or transmission line company.
- c) Contractor of the sole responsibility for any damage to underground pipelines or transmission lines caused in the performance of the Work.
- d) Breach of any requirement of Article 9.3 – Construction Work at or Near Pipelines and Transmission Lines is considered a substantial breach of the Contract, and the Town may immediately terminate the Contract.

9.4 Hazardous Products and Chemicals

- a) The Contractor, its Subcontractors, and its suppliers shall not use, transport, or store hazardous materials, products, or chemicals, as defined by the Occupational Health and Safety Act – Alberta, on the Site except with the prior written approval of the Town. All Hazardous Material used, transported, or stored shall be dealt with in accordance with Applicable Laws, the Contract Documents, and the entire Town's published regulations, guidelines, or publications regarding Hazardous Material.
- b) Before commencing work in any Town facility, the Contractor shall meet with the Town to discuss potentially hazardous material that will be used in the performance of the Work at the Site. This shall include material with the potential to cause hazards of a physical or chemical nature.
- c) Before commencing work, the Contractor shall conduct an assessment of the Site, reviewing existing materials that might contain any hazardous material, and notify the Town in writing of all findings. The Town will direct the Contractor on the appropriate course of action regarding such materials.
- d) If, during the performance of the Work, the Contractor further discovers potentially hazardous material in an area near or part of a portion of the Work, work in that area shall cease, access to the area should be restricted, and any relevant material protected from further deterioration until written authorization to proceed is issued by the Town.
- e) The Contractor shall maintain at the Site copies of all applicable material safety data sheets (MSDS) for all material that will be used in the performance of the Work.

9.5 Emergencies

- a) In the event of an emergency, the Town has the right to stop the progress of the Work whenever, in the opinion of the Town, such stoppage may be necessary to ensure the safety of life, the Work or portions of the Work, or property adjacent to the Site. This includes the authority to make Changes to the Work in accordance with the Contract Documents. The Town will immediately provide written confirmation of such instructions. The Contractor shall take such measures, as may be specified by the Town, that the Town considers necessary for the purpose of removing any source of danger or to protect any person, property, or portion of the Work from danger.
- b) The Contractor shall immediately notify the Town in the event of any accident resulting in serious injury, death, or property damage.
- c) The following phone numbers are provided for the Contractor's reference:
 - i) Ambulance, Fire, RCMP, and Environmental Spills (Emergency) 911
 - ii) Edson Fire Department (non-emergency) 780-723-3178
 - iii) RCMP/Municipal Enforcement (non-emergency) 780-723-8800
 - iv) Edson Healthcare Centre 780-723-3331
 - v) Provincial Spill Reporting 1-800-222-6514

- vi) Town of Edson 780-723-4401
- vii) Alberta Transportation
- d) The Contractor shall be responsible for ensuring these numbers are correct at the time of the performance of the Work and for posting such phone numbers and any additional emergency contact information at the Site.

10.0 APPLICABLE LAWS

10.1 Laws, Notices, Permits, and Fees

- a) The Contractor shall apply and pay for all necessary permits, licenses, inspections, and certificates required for the execution of the Work. This shall not include the obtaining of permanent easements.
- b) The Contractor shall give necessary notices and pay fees required by Applicable Laws and in order to preserve public health and safety. Where two or more Applicable laws govern the Work or portions of the Work, the more restrictive shall apply.
- c) The Contractor shall be responsible for performing the Work in compliance with Applicable Laws. If any substantial modifications to the Work are required as a result of the Contract being at variance with Applicable Laws, or if the Applicable Laws change subsequent to the date of the Contract, any resulting change in the cost shall constitute a corresponding change in the Contract Price. The Contractor shall promptly provide written notification to the Town requesting immediate direction upon discovery of any variance or changes that affect the Contract or the Work.
- d) If the Contractor fails to provide the Town written notification requesting immediate direction and performs the Work contrary to Applicable Laws, the Contractor shall be responsible for and shall correct any violations and shall bear all costs, expenses, and damages attributable to the Contractor's failure to comply with Applicable Laws.
- e) In the event that the Contractor fails to comply with Applicable Laws and the Town is required to take any steps or pay any sum to rectify non-compliance, the Town may set off any rectification costs against any amounts otherwise payable to the Contractor pursuant to the Contract.
- f) The Contractor acknowledges that the Town is subject to the Freedom of Information and Protection of Privacy Act – Alberta. This act applies to all records relating to or obtained, created, or collected under the Contract which are in the custody or under the control of the Town. The Contractor agrees to comply with the requirements of this act.
- g) The Contractor shall comply with all Applicable Laws with respect to environmental issues including, but not limited to, the Environmental Protection and Enhancement Act – Alberta.

10.2 Workers' Compensation

- a) When requested by the Town, the Contractor shall provide evidence of compliance with all requirements of the Workers' Compensation Act – Alberta,

including payments due, as provided in the act, by the Contractor or Subcontractors.

- b) If the Contractor is performing work in an exempt industry within the meaning of the Workers' Compensation Act and does not carry coverage, the Contractor acknowledges that:
 - i) The Town is subject to a deeming order under the Workers' Compensation Act;
 - ii) The deeming order states that all of the Contractor's directors, proprietors, partners, and employees are deemed to be Town employees for the purposes of the Workers' Compensation Act while performing work for the Town; and
 - iii) The effect of the deeming order is that the Contractor's directors, proprietors, partners, and employees who are injured while performing work for the Town under this Contract, have no right to file a suit against anyone with respect to said injury, and are limited to a claim under the Workers' Compensation Act.
- c) The Contractor shall communicate the existence and effect of the deeming order to all of the Contractor's directors, proprietors, partners, and employees who perform work under this Contract.

10.3 Occupational Health and Safety

- a) The Contractor shall comply with the provisions of the Occupational Health and Safety Act – Alberta, and shall be responsible for ensuring that all Subcontractors at the Site comply with the requirements of all Applicable Laws. The Contractor shall be the general representative and agent of the Town for the purposes of ensuring compliance with Applicable Laws relating to safety for both the Contractor and Subcontractors. The Contractor shall be responsible for communicating the provisions of the Occupational Health and Safety Act to Subcontractors.
- b) Unless stipulated otherwise in the Supplementary Conditions, the Contractor is assigned the role of Prime Contractor pursuant to the Occupational Health and Safety Act and is responsible for ensuring compliance with all Applicable Laws relating to safety by all employees, Subcontractors, Suppliers, and all other workers on the Site.
- c) Hazard and risk assessments, emergency information, and all other applicable safety documentation must be completed by the Contractor prior to commencing the Work. A copy of this information shall be forwarded to the Town for its records. A copy of this information shall also be kept at the Site.

10.4 Patent Fees

- a) The Contractor shall pay all royalties, patent fees, and license fees required for the performance of the Work. The Contractor shall indemnify the Town for all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Contractor's performance of the Work or the Town's use of the Work which attributable to an infringement or an alleged infringement of any patent, copyright, trade secret, or invention. If the Town is legally prevented from using

any Product or any portion of the Work, the Contractor shall substitute an equally equitable Product or portion of the Work, subject to the approval of the Town.

- b) The Town shall indemnify the Contractor for all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Contractor's performance of the Work which are attributable to an infringement or alleged infringement of any patent, copyright, trade secret, or invention due to the Contractor's use of models, plans, or designs of which were provided to the Contractor by the Town.
- c) If either the Town or the Contractor receives a claim for an infringement or alleged infringement of any patent, copyright, trade secret, or invention with respect to the Work, the party receiving such claim shall inform the other party in writing within two (2) days of receiving such claim.
- d) The Contractor grants the Town a non-exclusive, royalty-free, perpetual, irrevocable license:
 - i) To use any and all patents, industrial designs, copyrights, and technology related to the Work that the Contractor owns or controls, subject to the Contractor's legal right to do so; and
 - ii) To make, have made, and use the equipment, machinery, materials, compositions, designs, methods, and processes supplied by the Contractor under this Contract, subject to the Contractor's legal right to do so.

10.5 Importing Fees and Indemnity

- a) The Contractor shall undertake all needed operations and pay all relevant fees, charges, penalties, or duties levied in importing any Product, equipment, material, or services for the performance of the Work.
- b) With limiting the generality of Article 10.5a), if the Contractor is required to import Product, equipment, material, or services for the performance of the Work, the Contractor must ensure that the Contractor or Contractor's representative is the "IMPORTER OF RECORD" for Canada Customs and Revenue Agency purposes.
- c) The Contractor shall indemnify the Town for any fees, charges, penalties, or duties levied by the Federal Government related to any Product, equipment, material, or services imported by Contractor for the performance of the Work.
- d) If any import duties relating to Products increase or decrease subsequent to the Tender submittal deadline, any resulting change in the cost shall constitute a corresponding increase or decrease in the Contract Price.
- e) The Contractor shall cooperate fully with the Town and proper authorities in seeking to obtain refunds of all fees, charges, penalties, or duties to which the Town may be entitled.

10.6 Credits or Grants Applicable to the Work

- a) All credits, grants, or incentives of any nature provided by any municipal, provincial, federal, or international authority and attributable to the Work shall be the property of the Town.

- b) Without limiting the generality of Article 10.6a), if the Work results in the ability to demonstrate reductions in the generation of greenhouse gases, such reductions and any resulting greenhouse gas credits, offsets, or other instruments that may exist to measure and value such reductions shall be the property of the Town.
- c) If required and as may be requested by the Town, the Contractor shall provide the Town with all information, documents, and assistance as may be required to enable the Town to obtain all credits, grants, and incentives.

10.7 Licensing

- a) It is a requirement of the Town that all successful Contractors and their sub contractors who are providing a service will have a valid Town of Edson Business License prior to commencement of the work and maintain that license for the duration of the project.
- b) It may be a requirement of the Town that all successful Contractors who are providing a tangible product or good will have a valid Town of Edson Business License prior to commencement of the work and maintain that license for the duration of the project if they operate within Town limits.
- c) Contractors' includes any business, occupation, activity, amusement, entertainment, trade employment, profession or calling and the provision of a service of any kind that is conducted for the purpose of earning income, whether or not it is conducted for the purpose of earning a profit.

11.0 BONDS AND INSURANCE

11.1 Performance Bond

- a) The Contractor shall provide a Performance Bond to the Town. The Performance Bond shall guarantee the Contractor's faithful performance of the Work in conformance to the Contract, and detail thereof, shall protect the Town against any losses or damages arising by reason of failure of the Contractor to perform the Work as required by the Contract. The Performance Bond shall be in the form provided in Section 00 61 13.13 or CCDC 221, and issued by a Surety Company licensed in the Province of Alberta and satisfactory to the Town, and in the amount of 50% of the Contract Price.
- b) The Performance Bond provided shall remain in full force as a maintenance bond during the Warranty Period.
- c) The cost of the Performance Bond shall be borne by the Contractor.

11.2 Labour and Material Payment Bond

- a) The Contractor shall provide a Labour and Material Payment Bond to the Town. The Labour and Material Payment Bond shall specify as eligible claimants those who have a direct contract with the Principal or with any Subcontractor of the Principal. The Labour and Material Payment Bond shall be in the form provided in Section 00 61 13.15 or CCDC 222, and issued by a Surety Company licensed in the Province of Alberta and satisfactory to the Town, and in the amount of 50% of the Contract Price.

- b) The costs of the Labour and Material Payment Bond shall be borne by the Contractor.

11.3 Contractor's Insurance

- a) Without restricting the indemnification provisions of the Contract, the Contractor shall procure, maintain, pay for and keep in force for the duration of the Contract, coverage listed in the Conditions, unless otherwise stipulated herein, in a form acceptable to the Town and placed with Insurers licensed in Alberta a minimum of the following:
 - i) General Liability Insurance: The Limit shall not be less than Five Million Dollars (\$5,000,000.00) per occurrence and shall include coverage as respects liability arising out of activities performed by or on behalf of the Contractor, including Non-Owned Automobile, Broad Form Property Damage, Tenants Legal Liability, Products and Completed Operations, Employers Liability and Blanket Contractual Liability. The policy shall include cross liability and severability of interest.
 - ii) Property Insurance: On an All Risks basis covering loss or damage to the Contractor's tools and equipment to be used in the execution of the work specified in the Contract. Insurance on this property shall be on a replacement cost form.
 - iii) Automobile Liability Insurance: The Limit shall not be less than Two Million Dollars (\$2,000,000.00) per accident for bodily injury and property damage. The policy shall cover all vehicles owned, leased or licensed in the name of the Contractor
 - iv) Workers Compensation Insurance: Coverage to protect the Contractor from claims arising from injury to workers
- b) Other Insurance Provisions:
 - i) General Liability policy will be endorsed to add the Town as an Additional Insured with respect to liability arising out of the operations of the Named Insured.
 - ii) All policies will provide for Thirty (30) Days advance Notice of Cancellation to the Town.
 - iii) Contractor's property insurance policy shall provide a Waiver of Subrogation in favour of the Town.
 - iv) Evidence of required insurance in the form of a Certificate of Insurance, shall be submitted to the Town, prior the commencement of the Work. The Certificate of Insurance form provided in the Contract Documents shall be completed by the Contractor's broker and/or insurer. Replacement certificates showing evidence of renewed coverage shall be provided to the Town within 10 days of the stated policy expiry date. Certified copies of policies may be requested at the discretion of the Town.
 - v) All insurance documents are to provide a deductible not exceeding \$5,000, with the Contractor to be responsible for payment of all deductibles.

- vi) Representation: The Town does not make any representation or warranty with respect to the extent or adequacy of the insurance protection as noted above.
- vii) Obligations: The furnishing of this insurance shall not limit any of the obligations or liabilities expressed elsewhere in the Contract document.
- viii) Contractor – Sub-Contractors: If there is no project insurance (Wrap-Up or Builders Risk) the Contractor will pass on all insurance requirements to Sub-Contractors and will secure the same Certificates as the Contractor is required to provide to the Owner.

12.0 DAMAGES AND INDEMNITY

12.1 Damages and Mutual Responsibility

- a) If either party to the Contract should suffer damage in any manner because of the wrongful act or neglect of the other party, or anyone for whom the other party is responsible in law, then that party shall be reimbursed by the other party for such damage. The reimbursing party shall be subrogated to the rights of the other party in respect of such wrongful act or neglect if it be that of a third party.
- b) If the Contractor has caused damage to the work of any Other Contractor, the Contractor shall, upon due notice in writing, settle with the Other Contractor by negotiation or arbitration. If the Other Contractor makes a claim against the Town on account of damage alleged to have been so sustained, the Town shall notify the Contractor in writing and may require the Contractor to defend the action at the Contractor's expense. The Contractor shall satisfy a final order or judgment against the Town and pay the costs incurred by the Town arising from such action.
- c) If the Contractor becomes liable to pay or satisfy a final order, judgment, or award against the Town, then the Contractor, upon undertaking to indemnify the Town against any and all liability for costs, shall have the right to appeal in the name of the Town such final order or judgment to any and all courts of competent jurisdiction.

12.2 Indemnification

- a) The Contractor shall indemnify and hold harmless the Town and its representatives, agents, and employees from and against losses, claims, demands, payments, suits, judgments, costs, or expenses of every nature and description arising out of or in consequence of the Work or the performance of the Work. This shall include, but not be limited to, claims attributable to bodily injury, sickness, disease, or death, at anytime resulting there from, sustained by any person or persons, or on account of damage to property, including loss of use thereof arising out of or in consequence of the performance of the Work.
- b) In the event that any action, suit, claim, or demand be brought or made against the Town or its representatives, agents, or employees as set out herein, the Town will give notice in writing thereof to the Contractor, and the Contractor shall thereupon have the option of contesting the same or the validity thereof by appropriate legal proceedings. If the Contractor shall so elect, the Contractor

shall give notice in writing to the Town within five (5) days of the aforementioned notice from the Town. On final determination of such action, suit, claim, or demand, the Contractor shall immediately pay any judgment rendered against the Town or its representatives, agents, or employees together with all proper costs and charges.

- c) In the event that the Contractor shall not elect, within the aforementioned period of five (5) days, to contest any such action, suit, claim, or demand, the Town may compromise any such any such action, suit, claim, or demand at the sole discretion of the Town and on such terms as the Town shall deem reasonable, and the Contractor shall thereupon forthwith pay to the Town to sum or sums so paid herein, together with such sums as shall represent the reasonable costs of the Town in defending or settling any such action, suit, claim, or demand.
- d) Without restricting the generality of the foregoing for the purposes of Section 12.2 – Indemnification, costs shall mean solicitor and client costs, whether the Town retains in-house or external Counsel.
- e) The obligations of the Contractor under Article 12.2 – Indemnification shall not extend to the liability of the Town or its representatives, agents, or employees where such liability arises from the act or omission of the Town and where the Contractor, by the exercise of reasonable diligence, could not have prevented such a course of action from arising.

12.3 Waiver of Claims

a) Waiver of Claims by Town

As of the date of the Release of Holdback Certificate, the Town expressly waives and releases the Contractor from all claims against the Contractor including without limitation those that might arise from the negligence or breach of contract by the Contractor except one or more of the following:

- i) Those made in writing prior to the date of the Release of Holdback Certificate and still unsettled;
- ii) Those arising from the provisions of Article 5.7 – Warranty or Article 12.2 – Indemnification;
- iii) Those arising from the provisions of Article 9.4 – Hazardous Products and Chemicals, and arising from the Contractor bringing or introducing any toxic or hazardous substances and materials to the Site after the Contractor commence the Work.

b) Waiver of Claims by Contractor

As of the date of the Release of Holdback Certificate or acceptance of Final Payment, the Contractor expressly waives and releases the Town from all claims against the Town including without limitation those that might arise from the negligence or breach of contract by the Town except:

- i) Those made in writing prior to the Contractor's application for the Release of Holdback Certificate and still unsettled; and
- ii) Those arising from the provisions of Article 9.4 – Hazardous Products and Chemicals or Article 10.4 – Patent Fees.

SCHEDULE A – RULES OF ARBITRAL PROCEDURE

1.0 GENERAL

1.1 Interpretation

- a) In these rules:
 - i) The terms and phrases have the same meanings as may be attributed to them under the Arbitration Act – Alberta;
 - ii) The “Contract” means a contract containing an agreement to refer disputes to arbitration and appending these Rules, or incorporating them by reference; and
 - iii) The “parties” means the parties to the Contract.
- b) In these Rules, time shall be calculated in the same manner as time is calculated in the Contract.
- c) In these Rules, words in the masculine gender include the feminine and vice versa.

1.2 Application

- a) These Rules apply to an arbitration conducted under the Contract.
- b) The parties to arbitration may, by agreement, change or make additions to these Rules.

1.3 Communications

- a) All communications under these Rules shall be given in the same manner as communications may be given under the Contract.
- b) There shall not be any oral communication with respect to the issues in dispute between a party and the arbitrator unless it is made in the oral presence of both parties or their legal representatives
- c) A copy of all written communications between the arbitrator and a party shall be delivered to the other party at the same time.

1.4 Objections

- a) A party shall state any objections to any aspect of the arbitral proceedings or to the conduct of the other party or the arbitrator at the earliest possible time.
- b) The arbitrator may refuse to consider an objection if a party fails to comply with Article 1.4a).

2.0 PRE-ARBITRATION CONSIDERATIONS

2.1 Commencement

- a) Either party, henceforth referred to as the Claimant, may submit a dispute to arbitration as permitted under the Contract by giving the other party, henceforth referred to as the Respondent, a written notice containing the following:

- i) A description of the Contract;
 - ii) A statement of the issue in dispute;
 - iii) A request that the dispute be referred to arbitration;
 - iv) A description of the claim being made; and
 - v) The name or names of proposed arbitrators including the resume of the proposed arbitrator or arbitrators as specified in Article 2.2b).
- b) For the purposes of the calculation of time under these Rules, the arbitration shall be deemed to have commenced on the date the Respondent receives the notice under Article 2.1a).

2.2 Arbitrator

- a) The arbitration shall be conducted before a single arbitrator appointed under these Rules who possesses the qualifications, in any, agreed to by the parties.
- b) If a party nominates an individual as an arbitrator, that party shall also provide a written resume of the individual's work background, qualifications, and arbitration experience.
- c) The parties shall make every reasonable effort to reach agreement on an arbitrator within twenty (20) days after the arbitration commences.
- d) If an agreement is not reached under Article 2.2c), either party may make an application to the court for the appointment of an arbitrator.
- e) Before an arbitrator accepts an appointment, the arbitrator shall provide both parties with a written statement declaring that there are no circumstances likely to give rise to justifiable doubts as to the arbitrator's independence or impartiality, and that the arbitrator will disclose any such circumstances to both parties if they should arise before the arbitration is concluded.
- f) If, for any reason, the arbitrator resigns, is unable or refuses to act, or is removed from office, the arbitrator shall be replaced by another arbitrator under these Rules, and any oral hearings previously held shall be rescheduled.
- g) If the parties do not agree that the circumstances specified in Article 2.2e) exist, either party may apply to the Court for an order that the arbitrator be replaced.

2.3 Scheduling a Meeting

Within five (5) days after the arbitrator is appointed, the arbitrator shall convene a meeting of the parties to reach a consensus, if possible, and to issue orders, if necessary, regarding:

- a) The procedures to be followed during the arbitration;
- b) The time periods for taking steps in the proceedings;
- c) The scheduling of any oral hearing or meetings;
- d) Any preliminary applications or objections a party may have; and
- e) Any other matter which will assist the arbitration to proceed in an efficient and expeditious manner.

2.4 Powers of the Arbitrator

- a) Subject to any limitations in these Rules or any agreement reached by the parties, the arbitrator may conduct the arbitration in any manner the arbitrator considers appropriate, but each party shall be treated fairly and shall be given full opportunity to present its case.
- b) The arbitrator may:
 - i) Make an interim order on any matter with respect to which the arbitrator may make a final award, including an interim order for preservation of property which is subject matter of the dispute;
 - ii) Order inspection of documents, exhibits, or other property at any location;
 - iii) Order the recording of any oral hearing or meeting; and
 - iv) Extend or abridge a period of time required in these Rules or fixed or determined by the arbitrator where the arbitrator considers it just and appropriate in the circumstances.
- c) The arbitrator may adjourn the proceedings from time to time if the arbitrator considers that it would facilitate settlement discussions between the parties.

3.0 PROCEEDINGS

3.1 Exchange of Statements

- a) The parties shall exchange written statements of their respective positions in the dispute in the following manner:
 - i) The Claimant shall give a statement outlining the facts, the matters in issue, and the relief or remedy requested no later than ten (10) days after the meeting provided for in Article 2.3a);
 - ii) The Respondent shall give a statement outlining its response to the Claimant's statement and its counterclaim, if any, no later than ten (10) days following receipt of the Claimant's statement; and
 - iii) The Respondent, by counterclaim, shall give a statement outlining its defense to the counterclaim no later than ten (10) days following receipt of the counterclaim.
- b) The parties shall provide the arbitrator with copies of the statements exchanged in Article 3.1a).
- c) Each party shall attach to its statement in Article 3.1a) a list of documents upon which it tends to rely and which describes each document by kind, date, author, addressee, and subject matter.
- d) During the arbitration proceedings, the arbitrator may allow a party to amend or add to any statement made under Article 3.1a), unless:
 - i) The amendment or addition goes beyond the terms of the arbitration agreement in the Contract; or
 - ii) The other party would be prejudiced by the delay in making the amendment or addition.

3.2 Disclosure

- a) The arbitrator may order a party to produce any documents not disclosed under Article 3.1c) that such party has under its care, custody, or control and that the arbitrator considers to be relevant, within the time specified by the arbitrator.
- b) Each party shall allow the other party the necessary access at reasonable times to inspect and take copies of all documents that the former party has listed in Article 3.1c) or that the arbitrator has ordered to be produced under Article 3.2a).
- c) The parties shall prepare and send to the arbitrator an agreed statement of facts within the time specified by the arbitrator.
- d) Each party shall, not later than fifteen (15) days before the oral hearing commences, provide the other party with:
 - i) The name and address of any witnesses to be called and a written summary of their evidence; and
 - ii) In the case of an expert witness, a written statement or report prepared by the expert witness.
- e) Each party shall, not later than ten (10) working days before the oral hearing commences, give to the other party and the arbitrator an assembly of all documents to be introduced at the hearing.

3.3 Hearings and Meetings

- a) The arbitrator shall give the parties written notice of not less than:
 - i) Five (5) days of any oral hearings; or
 - ii) Three (3) days of any meetings which have not been previously scheduled under Article 2.3a).
- b) All oral hearings and meetings in the arbitration proceedings shall be conducted in private and the arbitrator and the parties shall keep all written communications and documents in respect of these proceedings strictly confidential.
- c) All oral hearings and meetings shall be conducted in the Town of Edson, Alberta, Canada.

3.4 Evidence

- a) The arbitrator shall not be required to apply the legal rules of evidence and shall determine the relevance and materiality of the evidence presented.
- b) All oral evidence shall be taken in the presence of the arbitrator and all the parties unless a party is absent by default or has waived the right to be present.
- c) The arbitrator may order any individual to be examined under oath or on affirmation in relation to the issues in dispute and to produce before arbitrator all relevant documents within the individual's care, custody, or control.
- d) The document assemblies delivered under Article 3.2a) shall be deemed to have been entered into evidence at the oral hearing without further proof and without being read out at the hearing, but a party may challenge the admissibility of any document so introduced.

- e) The arbitrator may permit a document to be introduced at the oral hearing which was not previously disclosed under Article 3.1a) or provided under Articles 3.2d)ii) or 3.2e). However, the arbitrator may take that default into account when determining the costs to be awarded in the arbitration.
- f) If the arbitrator permits the evidence of a witness to be presented as a written statement, the other party may require that witness to be made available for cross-examination at the oral hearing.
- g) The arbitrator may order a witness to appear and give evidence, and in that event, the parties may cross-examine that witness and call evidence in rebuttal.

3.5 Arbitrator Retained Experts

- a) The arbitrator may:
 - i) Retain one or more experts to give a written report on specific issues; and
 - ii) For that purpose, require a party to make available relevant documents, goods, or other property for the expert's inspection.
- b) The arbitrator shall give a copy of the expert's report to the parties, who shall have the opportunity to reply to it.
- c) On a request of a party, an expert retained under Article 3.5a) shall:
 - i) Make available to the party for examination all documents, goods, or other property in the expert's possession with which the expert was provided in order to prepare a report; and
 - ii) Provide the party with a list of all documents, goods, or other property not in the expert's possession, but with which was provided in order to prepare a report, and a description of the location of those documents, goods, or other property.
- d) The parties may cross-examine an expert on the report and may call evidence in rebuttal.

3.6 Default

- a) Where a Claimant, without sufficient cause and after five (5) days notice from the arbitrator, fails to provide the statement required under Article 3.1a)i) within the required time, the arbitrator may terminate the arbitration with respect to that claim.
- b) Where a Respondent, without sufficient cause and after five (5) days notice from the arbitrator, fails to provide the statement required under Article 3.1a)ii) within the required time, the arbitrator shall:
 - i) Continue the arbitration; and
 - ii) Require the Claimant to submit such evidence to support the claim as the arbitrator may require before making an award.
- c) Where a party, without sufficient cause, fails to appear at a scheduled oral hearing or fails to produce any evidence, the arbitrator may:
 - i) Continue the arbitration; and
 - ii) Make an award based upon the evidence before the arbitrator.

3.7 Close of Hearings

- a) The arbitrator shall close the oral hearings when:
 - i) The parties advise that they have no further evidence to give or submissions to make; or
 - ii) The arbitrator considers further hearings to be unnecessary or inappropriate.
- b) Where the arbitrator considers it to be just and appropriate to do so, the arbitrator may reopen the oral hearings at any time before making the final award.

4.0 THE AWARD

4.1 Award

- a) An arbitrator shall decide the dispute in accordance with Applicable Laws.
- b) The arbitrator shall:
 - i) Make a final award not later than twenty (20) days after the oral hearings have been closed; and
 - ii) Deliver a signed copy of the award to each party.
- c) The final award of the arbitrator shall be dated, be in writing, and state the reasons upon which it is based.
- d) The arbitrator may order interest to be paid in the final award.
- e) The final award is final and binding on the parties and the parties agree to comply with it as soon as possible.

4.2 Costs

- a) The arbitrator shall fix the costs of arbitration in the final award, which costs may include, but are not limited to, the following:
 - i) The fees of the arbitrator;
 - ii) Any necessary expenses incurred by the arbitrator;
 - iii) The fees, travel costs, and any other expenses of witnesses approved by the arbitrator; and
 - iv) Any fees, charges, or expenses for providing services to the arbitrator or the parties in connection with the arbitration.
- b) Except for the costs of legal fees and legal expenses of the successful party, the costs of the arbitration shall be borne solely by the unsuccessful party unless the arbitrator considers it appropriate under the circumstances to apportion them between the parties.
- c) With respect to the costs of legal fees and legal expenses of the successful party, the arbitrator:
 - i) May decide which party shall bear such costs if they were claimed during the arbitration;

- ii) May apportion such costs if the arbitrator considers it just and reasonable to do so; and
- iii) In either event, shall specify the amounts of such costs and the manner of determining such costs.
- d) In making a decision under Article 4.2c), the arbitrator is not limited to awarding the legal fees and expenses that the Court of Queen's Bench may award to a successful party in a civil action.
- e) The fees of the arbitrator shall be reasonable in amount, taking into account the amount in the dispute, the complexity of the subject matter, the time spent by the arbitrator in the arbitration proceedings, and any other relevant circumstances.

4.3 Amendments and Corrections to the Award

- a) Upon application of a party, an arbitrator may amend or vary a final award to correct:
 - i) A clerical or typographical error; or
 - ii) An arithmetical error made in computation.
- b) An application by a party to the arbitrator pursuant to Article 4.3a) shall be made within ten (10) days after such party receives the final award.
- c) Either party may apply to the arbitrator, within ten (10) days after receiving the final award, for clarification of the award. The arbitrator may amend the award where the arbitrator considers that such amendment will clarify it.
- d) Either party may apply to the arbitrator, within twenty (20) days after receiving the final award, to make an additional award with respect to claims presented in the proceedings but inadvertently omitted from the award. The arbitrator may amend the award to include an additional award or where the arbitrator considers that such amendment will clarify it.
- e) The arbitrator may not amend or vary the final award without the consent of both parties and not more than twenty (20) days after all parties have received the final award.

- END OF SECTION 00 72 00 -

1.0 Hierarchy of Documents

In the event of inconsistency or conflict in the provisions of the Drawings or Specifications, such as provisions shall take precedence and govern in the following order:

- .1 Contract Agreement
- .2 Addenda (if any)
- .3 Supplementary Conditions
- .4 Special Provisions
- .5 General Conditions
- .6 Detailed Specifications
- .7 Project Specific Drawings
- .8 Executed Tender Form
- .9 Instruction to Bidders
- .10 Tender Invitation

2.0 Section 00 21 13 – Instructions to Bidders, Tender Review and Evaluation has been modified. This tender will be a Weighted Tender and will be evaluated based on the criteria provided in Article 20.0 of Section 00 21 13. Bidders should closely examine the tender documents and all requirements.

3.0 Business License

The awarded Contractor and all subcontractors must obtain a Business License to operate in the Town of Edson.

[Business Licences | Town of Edson](#)

4.0 Removal or Addition of Work

The Town has the right to add or remove Work from the Contract as required due to approved budget.

The Town and the Contractor shall determine final contract limits and locations in the field prior to construction.

5.0 Provisional Items

The Contractor is requested to submit a unit price for any items identified in the Tender Form as “Provisional Items”. Provision items may be deemed unnecessary by the Contractor or the Town at the time of construction. The Town must approve any decision to implement work identified as provisional.

6.0 Contractor Responsibilities

- .1 The successful bidder will be assigned Prime Contractor status for this contract. The Prime Contractor is fully responsible to the Consultant for the acts and omissions of his Subcontractors to the same extent as he is responsible.

-
- .2 Quality Control
 - a) Further to section 01 45 00 Quality Control, Quality Assurance Testing will be completed by the Town in addition to testing completed by the Contractor.
 - b) Following removal of the underground utility installation and trench backfill, the subgrade is to be proof-rolled and visually inspected by a geotechnical engineer in order to determine the appropriate subgrade treatment. The depth of sub-base may be varied accordingly based on the findings of the geotechnical engineer's investigation.
 - .3 Site Superintendent
 - a) The Contractor shall provide a single competent Site Superintendent, pursuant to Article 2.1 of the General Conditions.
 - b) The Site Superintendent shall be named and designated as such at the Pre-Construction meeting. A formal written notice shall be submitted to the Town if a change of personnel is require for any reason.
 - .4 Traffic Accommodation submission for Town approval, detailed construction schedule for review indicating the accommodation plan for traffic access/egress to 56th Street / 10th Avenue intersection, 10th Avenue, 54th Street, and businesses and other property and allowing uninterrupted emergency access through the Construction site a minimum of ten (10) days prior to the planned placement of signage.
 - .5 The Contractor shall review and become familiar with the existing site conditions.
 - .6 The Contractor shall provide continuous erosion and dust control and monitoring of the site including but not limited to:
 - a) Surface cleanup; and
 - b) Dust control must be maintained at all times.
 - .7 Contractor will supply, install and maintain all detour, construction and access route signage. Drawings are to be provided to the Town Representative prior to installation for final approval.
 - .8 The Contractor is responsible for and shall include in the bid price all costs to access the sites and restoration to existing or better condition where damage occurs as a result of the work carried out to any Town facilities including turf, shrub beds, boulevards, parking lot, asphalt trails, concrete sidewalks, etc.
 - .9 The Contractor shall submit a Construction Phasing Plan. Phasing plan shall show construction phases which maintain a minimum of one vehicular access point per business or property except otherwise specified per Section 14.0.

7.0 Construction Schedule

- .1 The Contractor shall begin construction no later than **May 20, 2024** and shall attain substantial completion of the construction **no later than July 19, 2024** and construction completion **on or before August 5, 2023**.
- .2 No work on the project shall start until a pre-construction meeting is held and a construction schedule has been received and approved by the Town.

-
- .3 The Contractor shall provide a detailed construction schedule outlining all phases of the work including submittal reviews, RFI responses, subtrades, permits, procurement plan, etc.

8.0 Environmental Responsibilities

.1 General

- a) The Contractor shall comply with all Alberta Environment and Environment Canada laws and regulations. Refer to Article 10.1 g of Section 00 72 00 – General Conditions for further information on Provincial Environmental Responsibilities.
- b) The Contractor shall immediately notify the Town of any conflict between any provision of applicable environmental requirements or authorities. The Town shall direct the Contractor on which provision shall apply to the Work.
- c) Work on roads shall be in accordance with Article 4.17 of Section 00 72 00 – General Conditions and Article 5.5 of Section 01 52 00 – Construction Facilities.

.2 Submissions

- a) The Contractor shall submit the following material to the Town at least ten (10) days (two (2) weeks) prior to the preconstruction meeting:
 - i. Environmental Construction Operations (ECO) Plan: The Contractor must develop and implement a project and site-specific ECO Plan. The ECO Plan must be accepted by the Town prior to the start of construction.
 - ii. Traffic Accommodation Strategy: The Contractor must develop and implement project specific traffic control and accommodation of vehicles and pedestrians. Refer to Section 17.
 - iii. Granular Base Sieve: The Contractor must provide the Town with the proposed granular base sieve analysis from supplier.

.3 Inspection and Reporting

- a) All reports under the Contract shall be copied to the Town.
 - i. Spills and Releases:
 - 1. The Contractor must ensure that spills and releases are immediately reported to the appropriate regulatory agencies (Alberta Environment @ 1-800-222-6514) as required by law.
 - 2. For environmental emergencies please call 9-1-1 first;
 - 3. If the Contractor caused a spill or release into the environment, the Contractor shall satisfactorily clean the area and if necessary, remediate the affected area. The Contractor is responsible for identifying a satisfactory level of cleanup in consultation with the Town of Edson and relevant regulatory agencies
 - ii. Water Management:

1. Water management includes all storm runoff, dewatering, wastewater and potable water releases into the environment.

iii. Waste Management:

1. Hazardous materials must be stored a minimum of 100 m from waterbodies and storm/sanitary sewers.
2. Contractors must be fully compliance with TDG and WHMIS.

9.0 Timber Ownership

All tree removals and grubbing shall become property of the Contractor and disposed of at their own cost.

10.0 Cleaning of Public Right-of-Ways

It is the responsibility of the Contractor to ensure that no mud, dirt, soil or any other substances are spilled, dropped, washed or tracked onto Public Right-of-Ways, or areas that lead to catch basins connected to Public Systems. The Contractor is to clean any such material immediately, i.e. streets are to be swept with a street sweeper after work stoppage each day if necessary.

11.0 Warranty and Maintenance Period

Further to Section 00 72 00 General Conditions, Article 5.7 –Warranty, the warranty and maintenance period for all work included in this contract is two (2) years.

12.0 Notifications of Affected Parties

- .1 Further to or in place of Section 00 72 00 General Conditions, Article 4.18 – Notifying Affected Parties, the Contractor shall inform the Town and Alberta Transportation seven (7) days prior to placing all road signs.
- .2 On all local roads signs must be places five (5) days before work begins.
- .3 The Contractor shall hand deliver notices to all affected businesses/residents at least five (5) days in advance.
- .4 The Town shall receive a draft copy of the notices two (2) days prior to delivery for review and approval. These requirements do not alleviate the Contractor of the responsibility to get all traffic accommodation and on street construction permits approved prior to notice being given to residents or signs being placed on roadways.

13.0 Road Work

- .1 Further to section 00 72 00 General Conditions, Article 4.17 – Work on Roads, the Contractor shall develop and submit to the Town:
 - Traffic accommodation plan for maximizing vehicle and delivery access, and allowing uninterrupted emergency access through the Construction site a minimum of ten (10) days prior to the planned delivery of resident notices and placement of roadway signage.

- 2 Avenue and 4 Avenue lie within an Alberta Transportation ROW Right of Ways. Alberta Transportation must be contacted prior to Construction. Refer to Appendix C – Alberta Transportation Permit for Alberta Transportation requirements, which must be adhered to.
- .2 The Contractor shall provide safe pedestrian access along the job site at all times.

14.0 Traffic Accommodation

- .1 The Contractor shall submit full and complete details of the proposed Traffic Accommodation Strategy (TAS) for the construction a minimum of seven (7) days prior to the project's Pre- Construction Meeting. A review of the provisions of the TAS will be carried out by the Town of Edson and Alberta Transportation (AT). The TAS shall be performed in accordance with the Alberta Transportation crossing permit.
- .2 Refer to Article 6.0 for requirements for submitting Phasing Plan.
- .3 All aspects of traffic accommodation will be considered incidental to the pay item "Traffic Accommodation".
- .4 The TAS shall include, but is not limited to, the following details:
- a) Temporary signage, speed reductions, traffic barriers, pavement markings, etc. necessary to provide information to motorists, cyclist, and pedestrians, and to direct traffic flow through and around the work zone.
 - b) Variable Message Sign (VMS) installation minimum 7 days prior to construction. VMS signs shall be placed at the following location or as requested by the Town or Alberta Transportation.
 - i. Hwy 16 eastbound
 - ii. Hwy 16 westbound
 - c) Vehicle access shall be maintained per the following requirements:
 - i. Pedestrian access must be maintained to all residences throughout construction.
 - ii. Vehicle access must be maintained to all residences on the south side of 10th Ave from 56th Street to 52nd Street throughout construction.
 - iii. Vehicle access must be maintained to either 54th Street or 53rd Street throughout construction.
 - iv. Contractor to contact Tim Hortons, Sobeys, and Shoppers Drug Mart adjacent to 54th Street to determine road access requirements for clients and deliveries.
 - v. Pivotal Contractor to contact Pivotal Energy to determine road access requirements.
 - d) Uninterrupted emergency vehicle access and waste collection.
 - e) The Contractor shall schedule their work to minimize traffic delays. No parking of vehicles and equipment shall impact residential access.

-
- f) The Town will have the authority to further restrict the hours of work during heavy traffic periods or on days of special events put on by the Town of Edson.
 - .5 Roadway surfaces shall be kept clear at all times. Debris spilled, tracked, or otherwise deposited onto the roadway surface as a result of The Contractor's operations shall be removed immediately. Travel lanes, shoulders, and adjacent areas are to be kept clear of windrowed, piled or loose materials so that roadway surfaces are clean and drainage from the roadway can be maintained. Areas of ponding water on or adjacent to the roadway due to construction operations shall be corrected immediately.
 - .6 The Contractor's TAS shall include details of the proposed signing and channelization devised to be used at flag person stations, and other areas of potential conflict with motorists (i.e. intersection, turning lanes, etc.). At such locations, The Contractor will need to consider using traffic barrels, an increased size of traffic cone, an increased frequency of traffic cones or other traffic control devices, including oversized signs as described in Alberta Transportation's Manual "Traffic Accommodation in Work Zones 2008 (1st Edition)".

15.0 Temporary Contractor Laydown Area

- .1 The Contractor may request permission from the Town for use of a temporary construction laydown area. If no temporary construction laydown area can be provided by the Town, the Contractor shall be responsible for identifying and paying for a suitable construction laydown area.
- .2 The Contractor will be permitted use of the laydown area pending confirmation of viability and no impacts to Town services, operations, public safety, and with the understanding that the final approved location is fully remediated to previously existing condition prior to CCC inspection.
- .3 The cost of material, labour, and equipment to prepare and cleanup laydown area is considered incidental to the Work and no additional payment will be considered.

16.0 Work Limits

- .1 No work is to be completed on residential private property unless a Letter of Agreement is signed between the Land Owner, Town, and Contractor to define the limits of work, rehabilitation intentions and maintenance requirements.
- .2 Where work will occur on private property the Town will prepare a landowner agreement letter(s) and distribute to those businesses or homeowners identified by the Contractor and Consultant once limits are confirmed and reviewed by the Town.

17.0 Site Survey Layout

The Contractor is to establish project survey control and set out construction limits. The Contractor will collect as-built information for record and payment purposes. Per section 00 72 00 General Conditions, Item 4.3 Survey and Plans (c), the Contractor shall, at the Contractor's own expense, provide all other surveys as required for the performance and

execution of the work, and shall, on request, furnish the Town copies of the plans of those surveys.

18.0 Utilities

- .1 It is the Contractor's responsibility to ensure all utility owners are contacted and aware of the project. The Contractor is responsible for hydro-excavating and confirming the locations and elevations of all shallow utilities prior to construction.
- .2 The Contractor is responsible for adhering to all stipulated requirements of each applicable utility owner with regards to methods of exposing utilities, respecting required clearances, and having the required personnel on-site when work is being performed around utilities.
- .3 It is the Contractor's responsibility to coordinate and pay for any third party utility locators, if required, and any hydro-excavation costs required to locate utilities as per the direction of the utility owner or as deemed necessary to complete the required work.
- .4 In addition to Section 00 72 00 General Conditions, Article 4.5 – Utilities, the Contractor is advised that the known utility companies, Owners and Operators and their representatives are as follows:

Town of Edson Public Works	Contact: Darin Borysko Telephone: 780-723-6461

19.0 Coordination with Other Forces

- .1 Contractor shall be responsible for supervision and coordination of third party utility relocations specific to onsite electrical.
- .2 Contractor will be responsible for safeguarding existing and recently installed utilities within the Project Limits. Any damages and associated repair costs to utilities as a result of the Contractor's operations will be his responsibility and no separate payment will be accepted by the Town.-

End of Section 00 73 00 -

1.0 Work Under this Contract

- .1 The Work includes, but is not limited to, the following:
- a) Asphalt, concrete curb and gutter, and sidewalk removals;
 - b) Gravity sanitary main open-cut installation including manholes, lot services and connections to existing gravity sanitary network;
 - c) Subgrade preparation; supply, install, and compact Granular Base Course; and Granular Sub-Base;
 - d) Supply, install, and compact Asphalt Concrete Pavement;
 - e) Two highway crossings at 2nd Avenue and 4th Avenue;
 - f) Bypass pumping.

- .2 The Work to be undertaken is generally described as:

10th Avenue – 56th Street to 52nd Street Sanitary Upgrade

- Remove and Dispose Existing Road Structure to Design Subgrade 1,705 m²
- Concrete Curb & Gutter Removal 205 m
- Sidewalk Removal 205 m²
- Asphalt Concrete Pavement - Supply and Install (100mm Depth) 1,705 m²
- Supply and Install Granular Base Course 1,705 m²
- Supply and Install Granular Sub-Base 1,705 m²
- Subgrade Preparation - 150 mm Depth 1,705 m²
- Geogrid (Biaxial) 1,705 m²
- Non-Woven Geotextile 1,705 m²
- Standard 1.2m Sidewalk 230 m
- Rolled Face Concrete Curb & Gutter (250mm Gutter) - Supply & Install 205 m
- Remove & Replace Ex. Sanitary MH 21 Vert.m.
- Remove and Replace Ex. Sanitary Main (375 mm Dia.) Deep Excavation 150 l.m
- Remove and Replace Ex. Sanitary Main (375 mm Dia.) 265 l.m
- *Remove & Replace existing Sanitary Services with New 100mm Service (PROVISIONAL)* 19 No.
- *Remove & Replace existing Sanitary Services with New 150mm Service (PROVISIONAL)* 4 No.
- Bypass Pumping 1 LS
- CCTV Sewer Inspection 565 m

54th Street – 5th Avenue to 1st Avenue Sanitary Upgrade

- Remove and Dispose Existing Road Structure to Design Subgrade 1,245 m²
- Concrete Curb & Gutter Removal 40 m
- Asphalt Concrete Pavement - Supply and Install (100mm Depth) 1,245 m²
- Supply and Install Granular Base Course 1,245 m²
- Supply and Install Granular Sub-Base 1,245 m²
- Subgrade Preparation - 150 mm Depth 1,245 m²
- Geogrid (Biaxial) 1,245 m²

• Non-Woven Geotextile	1,245 m ²
• Standard Concrete Curb & Gutter (250mm Gutter) - Supply & Install	40 m
• Remove & Replace Ex. 1200mm Sanitary MH	30 Vert.m.
• Remove & Replace Ex. 1500mm Sanitary MH	3 Vert.m.
• Remove & Dispose Ex. Sanitary MH	8 Vert.m.
• Supply & Install New Sanitary MH	4 Vert.m.
• Remove and Replace Ex. 300mm Sanitary Main	7 l.m
• Remove and Replace Ex. 450mm Sanitary Main	470 l.m
• Remove and Replace Ex. 600mm Sanitary Main	333 l.m
• Bypass Pumping	1 LS
• CCTV Sewer Inspection	810m
• Fillcrete Backfill	34 l.m
• Landscaping Restoration	790 m ²

- .3 The Work, unless specifically stated otherwise, shall include the furnishing of all material, product, plant, labour, and transportation necessary to complete the Work. The intent is that the Contractor provides a complete job.
- .4 The Work shall not be deemed complete until all components are placed in operation by the Contractor and are operating satisfactorily.
- .5 Any minor item of the Work not called for in the specifications or shown on the Drawings but clearly required to meet the intent of design and normally provided for the proper operation of the Work shall be provided as if specifically called for in the Contract Documents. No additional payment will be made for this incidental work.
- .6 The use of the word "provide" or "provision" or "proposed" in the Contract Documents with respect to the Contractor's performance of the Work means "supply and install"; or "supply labour, materials, and equipment for the installation of". It does not mean supply only.
- .7 The Contractor shall supply all material for the Work unless expressly stipulated otherwise in the Contract Documents.

- END OF SECTION 01 11 00 -

1.0 General

- .1 Payments will be made based on the unit prices and lump sum prices bid in the Tender, and in accordance with Section 5.0 – Payments and Certificates of the General Conditions.
- .2 The prices bid for various items of work, unless specifically noted otherwise, shall include the supply of all labour, plant, products, material, and equipment necessary to construct the Work in accordance with the Contract Documents.
- .3 The prices bid for supply and installation shall be full compensation for supplying, hauling, handling, storing, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.
- .4 The method of measurement of the quantities for payment and the basis for payment will be in accordance with the following items of this section. All measurement will be done by the Town using generally accepted field survey methods.
- .5 Where the Tender shows separate items for supply and installation, the unit prices or lump sum prices bid for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage, and waste. Payment will be made only for material actually installed in the Work. Progress Payment for supply-only items shall be made only for material and product on the worksite and in the Contractor's care, and shall then become the property of the Town.
- .6 Other materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated or piled materials, are the property of the Town or of the owner of the land on which the Work is located. Only those materials specifically noted in the Contract Documents as belonging to the Contractor shall become the Contractor's property.
- .7 Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in the Work, such materials are not the property of the Contractor unless authorized in writing by the Town or specified to be disposed of by the Contractor.
- .8 With each progress payment claim, the Contractor and any pre-selected Supplier shall jointly certify a claim for payment for preordered material used or incorporated into the Work or delivered to the site of the Work during that claim period.
- .9 Upon complete performance of the Work, the Contractor shall credit the Town for material paid for as supplied on the worksite, but not incorporated in the Work, and remove the surplus material from the worksite.
- .10 Unless specifically stated otherwise, the following activities shall be deemed to be included in the cost of the measurement items and/or general items and no additional payment will be made for these activities:

- i) Correction of deficiencies
- ii) Removal and replacement of reject work
- iii) Protection of Work
- iv) All required surveys
- v) Mix design and quality control
- vi) Quality control and quality assurance
- vii) Submittals and samples
- viii) Arrangement of facilities for inspection
- ix) Clean-up of work site and laydown area

2.0 Measurement and Payment Clauses (specific to the Tender Form)

.1 Mobilization

- a) Mobilization and demobilization shall include the Contractor's costs of mobilization at the beginning of the project, and the costs of demobilization at the end of the project.
- b) Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities, project signage, shallow utility locates, record keeping for as-constructed data of all new construction, construction layout and as-built survey, public and business notifications and all preparation for performing the Work.
- c) The work site shall be delineated with snow fencing along the boulevard to impede pedestrian and vehicular traffic from crossing the work zone. Fencing shall be maintained throughout the duration of construction. No additional payment will be made for maintenance of fencing during construction.
- d) Included in demobilization are preparation and submission of operation and maintenance manuals, removal of all personnel, materials and equipment; and cleanup of the site and the Work.
- e) The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the Tender Price.
- f) Payment will be made as follows, or as approved by the Town:
 - i. 60% of the lump sum bid will be included in the first progress payment certificate;
 - ii. 40% of the lump sum bid will be included in the final progress payment certificate;
- g) The Town may, at the Town's own discretion, provide only partial payment if mobilization or demobilization is deemed not complete or insufficient to meet the demands of the Work.

.2 Traffic Accommodation

- a) Shall include temporary Traffic Control as per traffic accommodation submission and all requirements in the Alberta Transportation

Development Permit, the implementation of traffic control for the duration of the project (supply, install, maintain, and remove, at the end of the project, barricades, signage, flag people) and all incidental work for which separate payment is not specified.

- b) Shall include Site Signage and trail and pathway detours, including the supply, installation, maintenance, and removal of project specific signage/barricades/fencing, including the installation and maintenance of trail/sidewalk closure and detour signs, business information signs, and all incidental work for which separate payment is not specified.
- c) Shall include supply, installation, maintenance and removal of Variable Message Signs (VMS) placed at approaches to 56th Street, 10th Avenue, 54th Street, or as directed by the Town.
- d) This item shall be paid on a lump sum basis.
- e) Payment shall be made as follows, as approved by the Town:
 - i. 50% of the lump sum bid will be included in the first progress payment certificate after temporary traffic control, project signage and trail detours have been set up.
 - ii. 50% of the lump sum bid will be included in the final progress payment certificate.
- f) The Town may, at the Town's own discretion, provide only partial payment if Traffic Control & Signalization are not completed to the satisfaction of the Town.

.3 Remove & Dispose Existing Concrete

- a) Measurement and Payment for Saw Cutting, Removal and Disposal of Sidewalk and Curb & Gutter shall be made at the unit price bid per lineal meter basis as specified in the Schedule of Quantities and Prices.
- b) Payment will be full compensation for removal of concrete structures including Monolithic Sidewalk, Concrete Lane and Commercial Crossings, Ramps, inclusive of their corresponding curb and gutter, separate concrete walk, concrete swales, concrete driveways and the Removal of Concrete shall be measured and paid for by the corresponding unit as indicated in the schedule of quantities and, shall include but is not limited to: saw cutting at the limits of removal, breakout, removals, separation of materials, loading, hauling, disposal of materials, protection of existing structures and buildings, restoration of adjacent landscaped areas, excavation to accommodate new concrete structures and road right of way cross sections, grading of adjacent slopes to accommodate new concrete structure elevations, tipping fees of disposal site and general cleanup, drainage protection, dust control, maintenance and cleanup of haul routes and all associated labour, materials, tools, equipment and incidentals required for the removal and disposal of existing concrete structures at locations to be determined by the Engineer and Owner.

.4 Remove and Dispose Existing Road Structure to Design Subgrade

- a) Measurement and payment for Removal and Disposal of Existing Road Structure to Design Subgrade shall be made at the unit price bid per square meter basis as specified in the Schedule of Quantities and Prices..
- b) Payment will be full compensation for existing pavement structure removed and disposed of to accommodate the proposed roadway structure to the proposed subgrade depth. It shall include but is not limited to: cold milling where specified, saw-cutting at the limits of removal, break-out, materials, tools, equipment, and incidentals required for the removal and disposal of existing pavement structures, removals, excavation to proposed subgrade elevation, separation of materials, loading, hauling, and stockpiling salvageable materials at locations specified by the Town as requested, dispose of surplus and unsuitable materials including dumping fees if any, drainage protection, dust control, maintenance and cleanup of haul routes and all associated labour, materials, tools, equipment, and incidentals required for the removal and disposal of existing pavement structures.
- c) No differentiation will be made between various types or thicknesses of pavement structures, gravel structures, buried concrete or soil cement.

.5 Remove & Dispose Unsuitable Materials

- a) Remove & Dispose Unsuitable Material shall be considered incidental to the work. Will be removal, haul, and disposal of unsuitable materials, all labour, materials, equipment, tools, and incidentals necessary to complete the Work as shown on the Engineering Drawings and to the satisfaction of the Engineer.
- b) All unsuitable material shall become property of the Contractor and disposed of at the Contractor's offsite disposal site. No additional payment will be considered for Contractor's disposal site preparation, haul road maintenance, permits or fees.

.6 Supply & Install Granular Base Course (Des 3, Class 20) & Granular Sub-Base

- a) Measurement for Granular Base Course & Granular Sub-Base shall be made on a metre squared basis for the depth as specified on the Engineering Drawings or as directed in the field by the Engineer. All applicable measurements shall be verified with itemized truck weight receipts upon application.
- b) Payment for Granular Base Course & Granular Sub-Base shall be made at the unit price bid per square metre to the depth, designation and class of materials in the Schedule of Quantities and Prices. Such payment will be full compensation for supplying, processing, hauling, placing and compaction of the material on the roadways, supplying of water, adjusting moisture content, preparing the surface and conducting a proof roll on the finished surface.
- c) All materials, tools and incidentals necessary to meet the compaction and proof roll requirements to the necessary specifications shall be considered incidental to the work and no separate payment will be made.

- d) The bid price and payment shall also include full compensation for clean-up of all aggregate/asphalt materials that may fall off delivery trucks/equipment along public road haul routes and, the removal of any tack coat that has been tracked on to concrete structures or roadway pavement markings. All haul routes shall be inspected prior to commencement of work and again following completion of work to determine clean-up requirements. Any clean-up work not performed in a timely manner will be completed by the Town with all related costs deducted from final payments.

.7 Subgrade Preparation – 150mm Depth

- a) Measurement & Payment for Prepared Subgrade will be made at the unit price bid per square meter as specified in the Schedule of Quantities and Prices to the depth as specified.
- b) Such payment will be full compensation for scarifying, blading, watering, or drying, shaping, compacting, and conducting a proof roll on the subgrade for all roadways, accesses, and lanes. Payment will be made once the necessary compaction has been achieved.
- c) All materials, tools and incidentals necessary to meet the compaction and proof roll requirements to the necessary specifications shall be considered incidental to the work and no separate payment will be made.

.8 Non-Woven Geotextiles

- a) Measurement & Payment for Non-Woven Geotextile shall be made at the unit price bid on a square metre basis as specified in the Schedule of Quantities & Prices. No additional measurement will be made for overlaps or folds for manufacturer recommendations.
- b) Such payment will be full compensation for supplying, hauling, placing, and installing the material on the grade widening as directed by the Town or where compaction requirements cannot be met due to existing field conditions.

.9 Geogrid (Biaxial)

- a) Measurement & Payment for Geogrid (Biaxial) shall be made at the unit price bid on a square metre basis as specified in the Schedule of Quantities & Prices. No additional measurement will be made for overlaps or folds for manufacturer recommendations.
- b) Such payment will be full compensation for supplying, hauling, placing and installing the material on the grade widening as directed by the Town or where compaction requirements cannot be met due to existing field conditions.

.10 Concrete

- a) Measurement & Payment of the various concrete structures, built in accordance with the dimensions specified by Engineer or shown on the drawings, will be as follows:
 - i) Straight faced curb & gutter – linear metres (measured along the curb face)

- ii) Rolled faced curb & gutter – linear metres (measured along the curb face)
 - iii) Sidewalk – square metres
 - iv) Pararamps – item
 - v) Driveway Crossings
- b) The unit price bid for construction of the above structures shall include the supply of all materials as per the cross sections and details, restoration of any adjacent pavement structure, private walks, to accommodate new elevations (over cuts for removals and forming); 150 mm subgrade prep, the supply and replacement of granular base, forming and supply and placing of concrete, jointing, reinforcing, finishing, curing, backfilling, compaction and general clean-up.

.11 Sanitary Utility Sewage Piping

- a) Remove and Replace with New Sanitary Sewer shall be paid for in lineal meters along the centre line of the pipe, after the pipe has been installed for the diameters and materials as shown in the Bid Form. The Unit Price shall include but is not limited to: excavation, trenching, shoring, removal and disposal of existing sanitary sewer, disposal of surplus and unsuitable materials, disposal fees (if any), supply and compaction of material in pipe zone, supply and installation of pipe, insulation where required, all fittings, connections to manholes, backfill with native material and granular sub- base to the corresponding subgrade elevation, compaction, general clean-up and all associated labour, materials, tools, equipment, and incidentals required to remove and replace the existing sanitary sewer. This price shall also include temporary water and sanitary servicing to businesses and residences, and reinstatement of any stormwater catchbasins, manholes or piping, impacted by the work. This price shall also include any utility or service crossings.
- b) Over-Excavation (incl. Installation of Washed Rock) will be paid by meter squared installed. Price will include for excavation, removal and disposal of unsuitable materials, supply and installation of washed rock wrapped in filter fabric as directed by the Engineer.
- c) Locate, Remove and Replace Existing Sanitary Services with New c/w Connections to Property Line will be measured per service installed for the diameters and materials as shown in the Bid Form. The Unit Price shall include but is not limited to: locating existing service, removal and disposal of the surface structure, excavation, trenching, shoring, removal and disposal of existing service, disposal of surplus and unsuitable materials, disposal fees (if any), supply and compaction of material in pipe zone, supply and installation of sanitary service pipe, insulation where required, all fittings, connection to existing service and to the main; locating, removing and replacing corresponding riser if applicable, connections, backfill with native material and granular sub-base, compaction, restoration of surface structures as per details and all associated labour, materials, tools, equipment, and incidentals required to install the Sanitary Service.

Also included shall be the restoration of any private driveways, walks, fences, landscaped areas and the temporary removal and restoration of any street furniture required to install the new sanitary service.

- d) Remove and Replace Existing Manholes will be measured in vertical metres of new manhole installed, from the top of the frame to the lowest pipe invert, for the diameters indicated on the Bid Form.
- The unit price is to include, but not be limited to, the removal of the existing manhole, including frame and cover, pipe disconnections, loading, hauling, disposal off-site, disposal fees (if any), stockpiling of salvageable frames and covers at the Town's Public Works area, the supply and installation of new precast manhole sections, including pre-benched base, pipe stub outlets, grouting, sealing joints, grade rings as required, testing as specified, supply and installation of frame and cover, adjustment of manhole to finished grade, and all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.
- e) Supply and Install New Manhole will be measured in vertical metres of new manhole installed, from the top of the frame to the lowest pipe invert, for the diameters indicated on the Bid Form.
- The unit price is to include, but not be limited to, the supply and installation of new precast manhole sections, including pre-benched base, pipe stub outlets, grouting, sealing joints, grade rings as required, testing as specified, supply and installation of frame and cover, adjustment of manhole to finished grade, and all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.
- f) Remove and Dispose Existing Manholes will be measured per manhole removed, at locations noted within the drawings.
- The unit price is to include, but not be limited to, the removal of the existing manhole, including frame and cover, pipe disconnections, loading, hauling, disposal off-site, disposal fees (if any), stockpiling of salvageable frames and covers at the Town's Public Works area, and all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.
- g) Supply and Install New Frame and Cover will be measured in units installed. The unit price is to include, but not be limited to, supply and installation of frame and cover, adjustment of manhole to finished grade, and all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.
- h) Bypass pumping shall be measured and paid as a lump sum and shall cover the costs of procuring pumps, hoses, fittings, including fuel costs, capable of pumping at a rate such that no upstream flooding occurs, for the duration of the project as required. Price also to include barricading and temporary pedestrian by-passes over or around hoses, supervision, relocating pumps as required, diverting flows, and a back up pump with the same specifications for contingency purposes. Allow for continuous monitoring of water levels in upstream and downstream manholes. Ensure that there is no contamination of basements, ditches, roadways,

sidewalks, etc. with raw sewage. In the event of such contamination, immediate action shall be taken to close the source of contamination. Proper cleanup of the affected area shall be followed and no work shall commence until a re-evaluation of the complete process has been carried out. No rehabilitation work shall commence unless authorized. No extra payment will be made for decontamination, clean up, or down time.

- i) Temporary water supply required for the duration of the project during the sanitary replacement will be paid on a lump sum basis. The Lump Sum price shall include but is not limited to supply of materials and labour, coordination with the Town, chlorination, flushing, flushing and testing of temporary water pipe and fittings, connection to hydrants and businesses, provision of temporary pipe protection, and vehicular / pedestrian ramps and removal of all temporary water pipe and fittings.

.12 CCTV Sewer Inspection

- a) CCTV sewer inspections will be measured and paid for per lineal meter of sewer main inspected. The unit price is to include all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.

.13 Fillcrete

- a) Fillcrete backfill shall be paid for in lineal meters along the centre line of the pipe, after the pipe has been installed, for the highway crossings. Per Alberta Transportation requirements, all backfill for the highway crossings is required to be fillcrete, up to the underside of the asphalt layer. The Unit Price shall include but is not limited to: fillcrete supply and installation, general clean-up and all associated labour, materials, tools, and equipment.

.14 Landscape

- a) Measurement and payment for Landscaping Restoration shall be made at the lump sum price bid as specified in the Schedule of Quantities and Prices.
- b) Measurement and payment for Supply and Install Fence shall be made at the lineal meter price bid as specified in the Schedule of Quantities and Prices. The unit price is to include all labour, equipment, materials, tools, and all other incidentals necessary to perform the work.
- c) b) Such payment will be full compensation for: all required labour, equipment and tools; supply, preparation and clean-up of the surface; loading, hauling, spreading, placement, watering of landscape materials to be supplied by the Contractor.
- d) No separate payment will be made for stripping, excavating, preparing and backfilling as required which is considered incidental to the work.
- e) Tree protection will not be paid as a separate item but will be considered incidental to the work.

1.0 General

- .1 The Contract is based on the products, materials, equipment, and methods described by the Contract Documents.
- .2 The Town will consider proposals for substitution of products, materials, equipment, and methods only when such proposals are accompanied by full and complete technical documentation and all other information required by the Town to evaluate the proposed substitution.

2.0 Equals

- .1 Wherever the terms “or equivalent”, “or equal”, and “or approved equal” appear in the Contract Documents, the terms shall be understood to mean as being equal, in the opinion of the Town, in material content, workmanship, and quality to that designated as being the minimum acceptable standard.

3.0 Approval

- .1 No alternate product, material, equipment, or method shall be accepted unless the Town has issued written approval of the proposed alternate.
- .2 Nothing contained within the Contract shall create any contractual relationship between any Subcontractor, Supplier, or manufacturer and the Town.
- .3 A claim for an addition to the Contract Price because of changes in the Work necessitated by the use of alternates or equals will not be considered.
- .4 Approval of alternates shall be considered based on:
 - a) Impact to Contract Price
 - b) Improvements to quality
 - c) Compatibility with other components
 - d) Aesthetics
 - e) Impact to construction schedule

4.0 Use of Alternates

- .1 If the Contractor elects to provide an alternate product, material, equipment, or method than that specified in the Contract Documents, the Contractor shall be responsible for making all consequent adjustments, at the Contractors own expense, to make the alternate fit into the Work as specified.
- .2 The Contractor shall be responsible to pay any additional costs incurred by the Town for changes to the Contract Documents as a result of the use of any alternate.

1.0 Pre-Construction Meeting

- .1 The Town will schedule a pre-construction meeting of parties in contract to discuss and resolve administrative procedure and responsibilities. Representatives of the Town, Contractor, major Subcontractors, field inspectors, and supervisors must be in attendance.
- .2 After time and location of this meeting has been established, the Contractor shall notify all parties concerned a minimum of four (4) days before the meeting.
- .3 The Town will chair and record discussions and decisions, and circulate the minutes to all parties concerned.
- .4 The agenda for the pre-construction meeting shall include, but is not limited to, the following:
 - a) Introductions.
 - b) Confirmation of the Superintendent, project managers, and resident inspection personnel.
 - c) Lines of communication including contact list.
 - d) Establish protocols for communication, reporting, inspection, etc.
 - e) Occupational Health and Safety relationships and responsibilities.
 - f) Eco Plan and Environmental Responsibilities
 - g) Review of Contractor's site safety plan and procedures.
 - h) General review of General Conditions and Supplementary Conditions.
 - i) Review permitting requirements and applicable local regulations.
 - j) Submission schedule and protocol.
 - k) Review of the Contractor's Completion Schedule.
 - l) Requirements for temporary facilities.
 - m) Clear up any ambiguities or questions of interpretation known at that time.
 - n) Other business.
 - o) Distribution list.

2.0 Progress Meetings

- .1 Progress meetings through the progress of the Work will be held biweekly or more frequently if required by the Town.
- .2 The agenda for progress meetings shall include, but is not limited to, the following:
 - a) Review and approval of minutes of previous meeting.
 - b) Occupational Health and Safety.
 - c) Eco Plan / environmental issues.
 - d) Review of progress since previous meeting.

- e) Field observations, problems, and conflicts.
 - f) Progress, schedule, during succeeding work period.
 - g) Review submittal schedules: expedite as required.
 - h) Maintenance of quality standards.
 - i) Pending changes and substitutions.
 - j) Outstanding action items.
 - k) Date and location of next meeting.
 - l) Other business.
 - m) Distribution list.
- .3 The Town will provide meeting facilities for all participants.
- .4 The Town will preside at project meetings.
- .5 The Town will record the minutes of progress meetings. These will include significant proceedings and decisions. These will identify "action by" parties and date for completion of duty.
- .6 The Town will reproduce and distribute copies of minutes within three (3) days after each meeting and transmit to meeting participants and affected parties not in attendance.
- .7 Representatives of the Contractor, Subcontractor and Suppliers attending meetings must be qualified and authorized to act on behalf of the party each represents.

- END OF SECTION 01 31 19 -

1.0 General

- .1 Submittals shall conform to the provisions of this section to demonstrate that the specified products, materials, and equipment are furnished and installed in accordance with design intent as expressed in the Contract Documents.
- .2 Individual submittals are required as detailed in other sections of the specifications.
- .3 Until submissions are reviewed, work involving relevant products, materials, and equipment may not proceed.
- .4 At the time of submission the Contractor shall notify the Town in writing of any deviations in the shop drawings, product data, or samples from the requirements of the Contract Documents.
- .5 The Town will review and return submittals in accordance with a schedule agreed upon, or otherwise with reasonable promptness.
- .6 The Town's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents. A specific deviation on the shop drawings from the design concept requested by the Contractor may be approved or rejected in writing by the Town.

2.0 Identification of Submittals

- .1 Identify each submittal and resubmittal by showing at least the following information:
 - a) Name, address and telephone number of the submitter, and a name of an individual for contact.
 - b) Drawing number and specification number to which the submittal applies.
 - c) Whether an original submittal or resubmittal.
 - d) Confirmation of prior review by the Contractor.
 - e) Date of submittal or resubmittal.
 - f) Authorized signature of the Submitter.

3.0 Coordination of Submittals

- .1 Prior to submittal for the Town's review, coordinate all material:
 - a) Determine and verify field dimensions and conditions and conformance with specifications, including Material, catalogue numbers, type numbers and similar data.
 - b) Coordinate requirements between trades.
 - c) Coordinate with requirements under laws, regulations, etc.
 - d) Secure required approvals of public agencies, inspection agencies and standards agencies and show proof of approvals acquisition.

- e) Indicate any deviations from the intent of design as expressed in the Contract Documents and request specific review of these deviations.

4.0 Timing of Submittals

- .1 Make submittals far enough in advance to allow adequate time for coordination, Town's review, revisions and resubmittals, and for supply and delivery in time for the scheduled installation in the Work.
- .2 Allow at least ten (10) calendar days for the Town's review after receipt of submittals.
- .3 If either the Contractor or the Town so requests they shall jointly prepare a schedule fixing the dates for submission and return of submittals.
- .4 The Town will review and return shop drawings in accordance with a schedule agreed upon, or otherwise with reasonable promptness.
- .5 Costs due to delays in making submittals shall be borne solely by the Contractor.

5.0 Review of Submittals

- .1 The Town's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents. A specific deviation on the shop drawings from the design concept requested by the Contractor may be approved or rejected in writing by the Town.
- .2 Each reviewed shop drawing will be stamped by the Town with the following form of stamp, or similar:

REVIEWED	()
REVIEWED AS MODIFIED	()
REVISE AND RESUBMIT	()
NOT REVIEWED	()

This review by the Town is for the sole purpose of ascertaining conformance with the general design concept. This review shall not constitute approval of the detail design inherent in the submittal, responsibility for which shall remain with the Contractor submitting same. Review by the Town shall not relieve the Contractor of responsibility for errors or omissions in the submittal or of responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction, for installation, and for co-ordination of the work of all sub-trades.

- .3 The Contractor shall make any changes in shop drawings which the Town may require, consistent with the Contract Documents, and resubmit unless otherwise directed by the Town. When resubmitting, the Contractor shall notify the Town in writing of any revisions made by the Contractor other than those requested by the Town, in the Town's previous review.

1.0 Shop Drawings

- .1 The Contractor shall arrange for the preparation of clearly identified shop drawings and submit two (2) prints to be retained by the Town plus the number of copies required by the Contractor.
- .2 Shop drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item, and its method of connection to the Work and shall have sufficient space for the Contractor's stamp and the Town's stamp.
- .3 Shop drawings shall be in accordance with the International System of Units (S.I.) metric units.

2.0 Product Data

- .1 The Contractor shall provide clearly identified product data and submit two (2) prints to be retained by the Town plus the number of copies required by the Contractor.
- .2 Product data shall include but not be limited to:
 - a) Product assembly drawings
 - b) Materials list
 - c) Principal dimensions
 - d) Parts and components details
 - e) Letters of compliance with recognized standards where required
 - f) Operation data
 - g) Operation curves
 - h) Operation manuals where specified
 - i) Product Name and Model Number

3.0 Samples

- .1 Where the Contractor is required to provide a product sample to the Town in these specifications, the Contractor shall submit one (1) sample of each product, unless otherwise indicated in the particular specification.
- .2 A cover sheet shall accompany each sample and shall detail all information required under Article 2.1 of Section 00 33 00 – Submittal Procedures.
- .3 Upon the Town's review of the sample, a copy of the cover sheet shall be returned to the Contractor indicating the reviewed status as per Article 5.2 of Section 00 33 00 – Submittal Procedures.

4.0 Designs by the Contractor

- .1 Where the Contractor is responsible for engineering design of portions of the Work, this shall be clearly and specifically indicated on the Drawings or in the specifications of the Contract Documents.
- .2 Where the Contractor is required, either by law, regulation, or by the Contract, to provide engineering design, the Contractor shall employ the services of a Professional Engineer registered in the area in which the Work is to be performed, and all submitted designs shall bear the Seal and Signature of that Registered Professional Engineer.

- END OF SECTION 01 33 23 -

1.0 Construction Safety Procedures

- .1 Observe and enforce construction safety procedures required by the National Building Code 2006 Part 8 (if applicable), provincial government, Alberta Occupational Health and Safety Act and Regulations, Workers' Compensation Board, municipal statutes and authorities, and all other Applicable Laws.
- .2 The Contractor shall immediately notify the Town of any conflict between any provision of applicable safety requirements or authorities. The Town shall direct the Contractor on which provision shall apply to the Work.
- .3 Refer to Article 10.3 of Section 00 72 00 – General Conditions for further information on Occupational Health and Safety Requirements.
- .4 Work on roads shall be in accordance with Article 4.17 of Section 00 72 00 – General Conditions and Article 5.5 of Section 01 52 00 – Construction Facilities.
- .5 The Contractor shall develop safety procedures for all safety hazards, including hazard assessments and control measures. The Contractor shall ensure that all workers on the Site that are exposed or potentially exposed to such hazards are familiar with and follow the safety procedures.
- .6 Wherever hazardous products or chemicals are required for the performance of the Work or present on the Site, comply with the requirements of Article 9.4 of Section 00 72 00 – General Conditions.

2.0 Submissions

- .1 The Contractor shall submit the following material to the Town at least five (5) days in advance on work commencing on the Site:
 - a) Codes of Practice required by the Occupational Health and Safety Act for work to be performed.
 - b) Name and contact information for the Contractor's designated representative for compliance with applicable health and safety regulations related to the work.
 - c) Names and contact information for the Contractor's site representatives during the performance of the Work.
 - d) Names and contact information for emergencies. Refer to Article 9.5 of Section 00 72 00 – General Conditions for additional information.
- .2 One copy of all pertinent hazard assessments, safety procedures, emergency information, and all other applicable health and safety documentation shall be forwarded to the Town for its records; one copy of all such documentation must also be maintained by the Contractor on the Site at all times.

3.0 Inspection and Reporting

- .1 The Contractor shall conduct frequent inspections to ensure compliance with health and safety requirements.
- .2 Any observed unsafe conditions or work procedures shall be corrected in a timely manner.

- .3 In the event of a situation of imminent danger, the Contractor shall observe the requirements of Section 35 of the Occupational Health and Safety Act.
- .4 Any report provided by external inspection agencies to the Contractor shall be copied to the Town within 24 hours following receipt of the report.
- .5 All serious or potentially serious accidents or incidents shall be reported as required by the Occupational Health and Safety Act.

4.0 Alberta Environmental Protection and Enhancement Act (AEPEA)

- .1 The Contractor shall be responsible for conformance to the requirements of the AEPEA.
- .2 The Contractor shall report any release or spill that is caused during the performance of the Work, in accordance with the Act.
- .3 Reporting shall be to the Director of Pollution Control, Alberta Environment.
- .4 All reports under the Act shall be copied to the Town.

- END OF SECTION 01 35 26 -

1.0 General

- .1 The Laws and Regulations of the province of Alberta shall govern.
- .2 Codes, Standards and Regulations are specified in other sections of the specifications and the Work shall be done in accordance with those Codes, Standards and Regulations where applicable.
- .3 Wherever standards (e.g., CSA, ASTM and others) are referred to in these Contract Documents, the current edition at the Tender submission date shall apply.
- .4 Where there is a clear conflict between the referenced Standard and the Contract Documents, the Contract Documents shall apply.
- .5 Where there is an ambiguity between a Standard and any term of these Contract Documents, the Town shall, in the first instance, give an interpretation of the intent of the Contract.
- .6 If the National Building Code of Canada applies to the Work, the standards of the Work shall conform to or exceed the minimum standards of the National Building Code of Canada.
- .7 Should any portion of the Work fall under the purview of the Alberta Public Works Act, the Alberta Public Works Act shall apply to the Work.
- .8 All other Alberta Laws and Regulations shall apply as appropriate and the Contractor shall comply with the requirements thereof as though they had been specifically named in these specifications.

2.0 Burning

- .1 No burning shall be allowed.

3.0 Archaeology, Antiques, and Relics

- .1 With respect to requirements for preserving historic resources, the Alberta Historical Resources Act and Regulations thereunder shall be complied with. Any item of suspected paleontological, historical or archaeological significance shall remain the property of the Town, shall be preserved and recovered within the requirements of the Alberta Historical Resources Act.
- .2 Notify the Town whenever any item of paleontological, archaeological or historical value is discovered and suspend operations on the Work immediately until the Town issues instructions and authorizes that the Work may proceed. The Town may issue a Change Order if, in the opinion of the Town, the Contractor is unduly delayed or is required to perform extra work by reason of the discovery and preservation of any paleontological, archaeological or historical resource.
- .3 The Town will, in the first instance, make a determination of the validity of a claim for delay and an estimate of the time of delay, and of the validity of the Contractor's claim for additional payment and an estimate of the amount of the additional payment.

1.0 Abbreviations and Acronyms - Specifications, Methods, Standards

.1 General

AASHTO Officials	American Association of State Highway and Transportation
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ARCA	Alberta Roofing Contractors Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Associations
AWS	American Welding Society
BCLMA	B.C. Lumber Manufacturer's Association
CAN	National Standard of Canada
CCA	Canadian Construction Association
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CPCI	Canadian Prestressed Concrete Institute
CRCA	Canadian Roofing Contractors Association
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
ISO	International Organization for Standardization
NBC	National Building Code
OH&S	Occupational Health & Safety
PCI	Prestressed Concrete Institute
PMBC	Plywood Manufacturer's Association
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
WCB	Worker's Compensation Board

.2 Utilities

API	American Petroleum Institute
AWWA	American Water Works Association
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CSPI	Corrugated Steel Pipe Institute
IAO	Insurer's Advisory Organization
RTAC	Roads and Transportation Association of Canada
ULC	Underwriters Laboratories of Canada
USA	United States of America Standards (ASA)

.3 Use of Abbreviations

These abbreviations and acronyms refer to Specifications, Methods and Standards issued by the respective Association, and the abbreviations are used in the specifications.

Alphanumeric designations following the abbreviations denote the specification, method, or standard.

2.0 Abbreviations and Acronyms – Metric

.1 General

The specifications are metric and metric usage is based upon SI units in accordance with CSA Standard CAN/CSA-Z234.1 Canadian Metric Practice Guide. In this specification SI units are abbreviated in accordance with the Metric Units and Abbreviations below.

.2 Linear Measure

Metre	m or lin.m.
Millimetre	mm
Kilometre	km
Micrometre	micro-m

.3 Area

Square metre	m ²
Square millimetre	mm ²
Hectare	ha

.4 Volume

Cubic metre	m ³
Litre	L

.5 Mass and Density

Kilogram	kg
Gram	g
Tonne	t
Kilogram per metre	kg/m
Gram per metre	g/m
Kilogram per cubic metre	kg/m ³

.6 Temperature

Degree Celcius	°C
----------------	----

.7 Force, Pressure, Stress

Newton	N
Kilonewton	kN
Pascal	Pa
Kilopascal	kPa
Megapascal	MPa

.8 Velocity, Rate of Flow

Metre per second	m/s
Metre per hour	m/h
Kilometre per hour	km/h
Litre per second	L/s
Cubic metre per second	m ³ /s

.9	Power, Energy, Heat, Work	
	Watt	W
	Kilowatt	kW
	Kilowatt hour	kWh
	Joule	J
.10	Electricity	
	Ampere	A
	Volt	V

- END OF SECTION 01 42 13 -

1.0 General

- .1 The Contractor is solely responsible for the quality of material, product, equipment, and workmanship which the Contractor provides and for the Work.
- .2 The Contractor is responsible for quality control and shall perform such inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents. The completion of these tests does not relieve the Contractor of sole responsibility to supply material, product, and equipment, and to perform the Work in accordance with the requirements of the Contract Documents.
- .3 During the progress of the Work, a sufficient number of tests shall be performed by the Contractor to determine that material, product, equipment, and installation meet the specified requirements.
- .4 Minimum requirements regarding quality control are specified in various sections of the specifications, however, the Contractor shall perform as many inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.
- .5 Testing shall be in accordance with pertinent codes and regulations.
- .6 Product testing, mill tests, and laboratory reports to demonstrate that product, material, and equipment supplied by the Contractor meet the specifications are specified under various sections of the Contract Documents.

2.0 Quality Control Testing by the Contractor

- .1 The Contractor shall retain the services of an independent testing agency under supervision of a registered professional engineer, and pay the cost of testing services for quality control including, but not limited to, the following:
 - a) Sieve analysis of sands and aggregates to be incorporated into the Work.
 - b) Aggregates and mix designs for soil cement base course.
 - c) Aggregates and mix designs for asphaltic concrete.
 - d) Aggregates and mix design for Portland Cement concrete.
 - e) Standard Proctor Density curves for backfill and borrow materials.
 - f) Mill tests and certificates of compliance.
 - g) Applicable quality control testing for precast concrete.
 - h) Any product testing that is required and is specified under various sections of the specifications.
 - i) Backfill, sub-base and base compaction testing
- .2 The Contractor shall provide all labour, materials, and equipment, and shall perform all tests, for linings, coatings, pressure tests, leakage tests, infiltration tests, and all other tests specified under the various sections of the specifications.
- .3 The Contractor shall promptly process and distribute all required copies of test reports and test information and related instructions to all Subcontractors and

Suppliers to ensure that all necessary retesting and replacement of construction can proceed without delay.

- .4 The Contractor shall promptly provide the Town with copies of all test results.

3.0 Quality Assurance Testing by the Town

- .1 The Town will retain and pay for the services of an independent testing agency for testing for quality assurance, for the Town's purposes.
- .2 The Town's testing agency and the Town will inspect and test material, product, equipment, and the Work for conformance with the requirements of the Contract Documents; however, they do not undertake to check the quality of the Work on behalf of the Contractor nor to provide quality control.
- .3 Inspections and tests by the Town's testing agency and by the Town do not relieve the Contractor of sole responsibility to supply material, product, and equipment and to perform the Work in accordance with the requirements of the Contract Documents.
- .4 The Town may, at its discretion, order or perform any additional inspections and tests.
- .5 The Contractor shall coordinate with the Town the scheduling of testing and inspection by the Town's testing agencies or by the Town, to enable testing to be done as necessary, without delay, and the Contractor shall notify the Town sufficiently in advance of operations to allow for such inspection and tests by the Town or the Town's testing agency.

4.0 Code Compliance Testing

- .1 Inspections and tests required by codes or ordinances, or by a plan approval authority, shall be the responsibility of and shall be paid for by the Contractor.
- .2 Copies of reports resulting from such inspections shall be submitted in a timely manner by the Contractor to the Town.

5.0 Retesting

- .1 When tests on product, material, equipment, or completed portions of the Work carried out by the Town's testing agency yield results not meeting the requirements of the Contract Documents, the Contractor, in addition to carrying out remedial work or replacement of the product, material, equipment or completed portions of the Work, shall provide for retesting of the remedied work.
- .2 Retesting, including retesting by the Town's testing agency, shall be at the Contractor's expense.
- .3 In every case where the Contractor has submitted test results which fail to meet the requirements of the Contract Documents, the Contractor shall submit, within a practical and reasonable time, results of a retest showing that the results are in accordance with the requirements of the Contract Documents.
- .4 If the Contractor fails or refuses to do remedial work or replace unacceptable material, product, equipment, or portions of the Work, the Town may refuse to certify payment, in addition to any other remedies the Town may have.

- END OF SECTION 01 45 00 -

1.0 TEMPORARY UTILITIES

1.1 Natural Gas, Gasoline and Other Fuels

- .1 Provide natural gas, gasoline, and other fuels required for the performance of the Work, in accordance with governing regulations and ordinances, and the Contract Documents.
- .2 Provide all necessary temporary piping and, upon completion of the Work, remove all such temporary piping.

1.2 Water

- .1 Where performance of the Work requires water supply, the Contractor may obtain water from the Town's fire hydrants provided the following conditions are met:
 - a) Obtain Fire Hydrant permit from Public Works;
 - b) Immediately after each use, the Contractor shall close the portable butterfly valve and shall turn the hydrant operating nut to the closed position to prevent any backflow contamination in the water mains;
 - c) The operating nut shall not be over-tightened as to damage the hydrant when turning it off;
 - d) A list of hydrants used by the Contractor (and subcontractors) shall be submitted by the Contractor to the Town on a weekly basis, identifying the location of the hydrant, company name of user, and the date of use;
 - e) The Contractor shall be responsible for all claims arising from the misuse of Town hydrants by the Contractor; and
 - f) Access to fire hydrants must be maintained at all times for emergency services.
- .2 Provide all necessary temporary piping and, upon completion of the Work, remove all such temporary piping.
- .3 Failure to meet the preceding conditions may result in penalties and related costs, incurred by the Town, to be charged to the Contractor.
- .4 The Contractor is not authorized to operate any existing main valve in the Town's water distribution system. The Public Works Department must be contacted to operate any existing main valve.

1.3 Sanitation Facilities

- .1 If required, provide and maintain temporary toilet facilities at the Site.
- .2 Upon completion of the Work, remove all such temporary toilet facilities.
- .3 Prohibit and prevent the committing of nuisances by workers on the Site or adjoining property.
- .4 Remove any worker who commits a nuisance.

1.4 Electricity And Lighting

- .1 Provide electricity and artificial lighting required for the performance of the Work, in accordance with governing regulations, ordinances, and the Contract Documents.
- .2 Provide all necessary temporary wiring, distribution boxes, panels, etc., and, upon completion of the Work, remove all such temporary installations.

1.5 Telephone

- .1 Arrange and pay for telephone service on the Site.
- .2 Provide Town representatives access to a telephone on the Site for local phone calls and emergencies if required.

1.6 Heating And Ventilating

- .1 Provide heating and ventilating, coverings, and enclosures as necessary to protect and perform the Work.
- .2 Provide all necessary temporary equipment, piping, wiring, ducting, and other materials necessary to perform the Work and, upon completion of the Work, remove all such temporary equipment.
- .3 Temporary heating and ventilating shall be in accordance with all governing regulations, ordinances, and the Contract Documents.
- .4 Temporary heating and ventilating shall be provided to:
 - a) Facilitate progress of the Work;
 - b) Protect the Work, products, material, and equipment against dampness and cold;
 - c) Prevent moisture condensation on surfaces;
 - d) Provide an atmosphere for curing material as required;
 - e) Provide adequate ventilation to meet safety regulations;
 - f) Prevent hazardous accumulation of dust, fumes, mists, vapours, or gases in areas occupied during construction; and
 - g) Ventilate storage spaces containing hazardous or volatile materials.

1.7 Fire Protection

- .1 Provide for adequate fire protection of the Work and adjacent property.
- .2 Provide temporary extinguishers, hydrants, and other equipment as required and, upon completion of the Work, remove all such temporary equipment.
- .3 Refer to Article 9.0 – Protection of Work, Property, and Life of the General Conditions for further requirements.

2.0 CONSTRUCTION AIDS

2.1 Temporary Plant

- .1 Provide all temporary items such as, but not limited to, stairs, ladders, scaffolding, ramps, transportation of labour and material, runways, chutes, hoists, elevators, tools, templates, and other temporary plant as required in the performance of the Work.
- .2 The location of such items shall be such as to prevent interference with, marking of, or damage to any portion of the Work.
- .3 All such items shall conform to all applicable national and local ordinances regulating safety, and to the National Building Code of Canada, and to the requirements of the Contract Documents.

2.2 Temporary Enclosures

- .1 Provide, for the duration of construction, all required scaffolds, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, and other temporary enclosures necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

2.3 Falsework And Temporary Construction Supports

- .1 The Contractor shall be responsible for means and methods used for the falsework and temporary construction supports.
- .2 If required by the Contract, employ a qualified Registered Professional Engineer for the design of temporary works, and design in accordance with CSA S269.1.
- .3 Record design calculations and drawings to show that temporary works are adequate. Provide design loads, material details, and dimensions. Sign and seal design calculations and drawings, and revisions thereto.
- .4 The Town's approval to proceed with falsework and temporary construction supports shall not relieve the Contractor of its responsibility under the Contract. The Town's review shall be for general conformance to the intent of design and for permanent effects on the Site, or areas adjacent to the Site.

2.4 Temporary Excavation

- .1 The Contractor is responsible for the means and methods of making temporary excavations in order to install components of the Work.

3.0 PROTECTION

- .1 Remove trees, fences, and other structures from the site of the Work as necessary to perform the Work.
- .2 Remove only those items that must be removed, or are clearly shown on the Drawings to be removed. Where an item must be removed that is not shown on the Drawings, obtain the Town's approval prior to commencing with the removal.

- .3 Protect all remaining trees, plants, fences, and other items from damage during construction.
- .4 Where the bark of tree trunks is damaged or removed in the Contractor's performance of the Work, the Contractor will be assessed a maintenance charge according to the following table:

Area of Bark Removed	Maintenance Assessment
Less than 0.006 m ²	\$100.00
From 0.007 to 0.010 m ²	\$200.00
From 0.010 to 0.023 m ²	\$500.00
Greater than 0.024 m ²	\$1,000.00

Maintenance assessments shall be deducted from any remaining payment due to the Contractor.

4.0 EXISTING UTILITIES AND STRUCTURES

- .1 Existing utilities and structures include pipes, culverts, ditches, or other items which are a part of an existing sewerage, drainage, or water system; or which are a part of a gas, electrical, telephone, television, telecommunications, or other utility system. Also included are sidewalks, curbs, gutters, swales, poles, fences, or any other structures encountered during construction.
- .2 The Contractor shall be responsible for location, protection, removal, or replacement of existing utilities and structures, or for repair of any damage which may occur during construction.
- .3 Existing utilities and structures may be shown on the Drawings, or described in the specifications. Such information is shown for design purposes and the existence, location and detail given is information that is obtained during the design period and is not necessarily complete, correct or current.
- .4 The Contractor shall pay all costs and be responsible for establishing locations and state of use of all existing utilities that may affect the Work. The Contractor shall make satisfactory arrangements with the utility companies involved for the location, protection, and inspection of existing utilities.
- .5 Notice in writing shall be given by the Contractor to the utility companies at least 48 hours before work commences in the vicinity of existing utilities.
- .6 The Contractor shall pay all the costs involved in protection of utilities, inspection of utilities, and all costs due to delays because of existing utilities and structures.
- .7 The Contractor shall provide for the uninterrupted flow of all watercourses, sewers, and drains encountered during the Work.
- .8 Access shall be maintained to all existing structures such as valves, hydrants, meter chambers, and control structures at all times during construction.
- .9 If interruption of service provided by an existing utility is necessary, the planned shut-down shall be approved by the owner of the utility. Requests for shut-down shall be made by the Contractor in writing at least 48 hours in advance.

- .10 The Contractor shall notify all customers or make arrangements with the utility company to notify all customers at least 48 hours in advance of a planned shut-down.
- .11 Unless otherwise specified, the Contractor shall make arrangements for relocation of existing utilities that the Town requests to be relocated; and the actual relocation shall be constructed by the owner of the utility unless other arrangements are approved by the Town in writing. The Contractor will be reimbursed the invoiced cost of the relocation. No extra payment is permitted for delays, or standby time.

5.0 TEMPORARY CONTROLS

5.1 Noise Controls

- .1 Noise levels to conform to the Workers' Compensation Board's Occupation Health and Safety Regulations.
- .2 Refer to Article 4.19 – Allowable Working Hours on the Site of the General Conditions for further information regarding allowable working hours.
- .3 Take special precautions and apply noise abatement measures to reduce public exposure to noise to a minimum. Such measures include, but are not limited to:
 - a) Shields or other physical barriers to restrict the transmission of noise;
 - b) Soundproof housings or enclosures for noise producing machinery such as compressors, pumps, motors, generators, etc.;
 - c) Efficient intake and exhaust silencers on air equipment;
 - d) Efficient intake and exhaust mufflers on internal combustion engines;
 - e) Sound deadening lining material on hoppers and storage bins;
 - f) Conducting truck loading, unloading, and hauling operations in a manner that keeps noise to a minimum;
 - g) The use of electric rather than internal combustion engine power on equipment such as chain saws, hoisting equipment in fixed locations, or other equipment where electric power is available; and
 - h) Placement of stationary noise producing equipment at maximum distance from public areas.
- .4 The Town may require specific noise controls be instituted in the event of overnight work approved under Article 4.19 of the General Conditions.

5.2 Dust Control

- .1 Perform the Work in a manner that will not produce an objectionable amount of dust. Should the Town determine that dust control measures are required due to the performance of the Work, the Town may direct the Contractor to provide dust control at the Contractor's expense.

- .2 Following mill and paving completion and exposure of gravel road base for resident use, dust control measures shall be put in place by the Contractor including but not limited to provision and regular use of a water truck.

5.3 Pollution Control

- .1 Abide by the requirements of Applicable Laws with respect to air and water pollution control requirements.

5.4 Sediment Control

- .1 The Contractor shall maintain sediment control for surface drainage at the site, acceptable to the Town.
- .2 Additional sediment controls may be ordered in the event, or risk, of accidental spill or release to the environment.
- .3 The Contractor shall comply and cooperate with Town with respect to any reporting requirements for environmental agencies in the event of a spill or release.

5.5 Disposal Of Wastes

- .1 Burying of rubbish and waste on site is not permitted.
- .2 Disposal of waste or volatile materials into waterways, storm, or sanitary sewers is not permitted.
- .3 Pumping or draining water containing silt in suspension into waterways, sewers, or drainage systems is prohibited.
- .4 Abide by requirements of Applicable Laws respecting disposal of wastes.
- .5 Obtain required permits for waste disposal.
- .6 Burning of waste is not permitted.

5.6 Traffic Control

- .1 The Contractor shall be responsible for all advanced-warning signage for notifying the public of pending traffic detours, if required, and appropriate detour signage during construction.
- .2 The Contractor shall be responsible for the regulation of traffic during construction, and shall perform the Work in a manner that will cause the least disruption of traffic.
- .3 The Contractor shall coordinate the Work with the Town to reduce traffic problems.
- .4 Unless otherwise provided elsewhere in these Contract Documents, no roads may be completely closed during performance of the Work. The Contractor must ensure that vehicular and pedestrian traffic is not subject to unreasonable or unnecessary restrictions.
- .5 The Contractor must comply with the provisions of Article 4.18 – Notifying Affected Parties of the General Conditions in the event that performance of the Work requires disruption to regular traffic patterns or property access.

- .6 If at any time the Town determines that unnecessary restrictions are being placed on vehicular or pedestrian traffic, or that the Contractor has insufficient traffic control measures are in place, the Contractor shall take whatever reasonable steps the Town deems necessary to alleviate such restrictions or insufficiencies.
- .7 Provision of flagmen, traffic signs, and other traffic controls shall be the Contractor's responsibility and shall be in accordance with the TAC Manual of Uniform Traffic Control Devices.
- .8 The Contractor shall supply all barriers, barricades, warning signs, detours, fences, flagmen and all other devices to protect the public. All applicable safety standards shall be followed.
- .9 The Contractor shall obtain written approval from the Town to block traffic temporarily if it is necessary to do so to perform the Work. At least one (1) week prior to blocking traffic, unless in the event of an emergency, notify the following:
 - a) Town of Edson 780-723-4401
 - b) Edson Fire Department (non-emergency) 780-723-3178
 - c) Bylaw Enforcement (non-emergency) 780-723-3178
 - d) Police(non-emergency) 780-723-8800
 - e) Alberta Transportation (non-emergency) 780-723-8250
- .10 Adequate construction parking, meeting local regulations, shall be provided by the Contractor.
- .11 Haul routes shall be maintained by the Contractor. They shall be kept open to traffic and shall be clean at all times.
- .12 Obtain permits as required to use public roads or streets for haul routes.
- .13 Refer to Article 4.17 – Work on Roads of the General Conditions for additional requirements for traffic control and working on roads.

5.7 Security

- .1 Provide all necessary lighting, fencing, hoarding, security services, and personnel necessary to adequately protect the Work and the public.
- .2 Refer to Article 9.0 – Protection of Work, Property, and Life of the General Conditions for additional requirements related to safety and security.

6.0 CONTRACTOR'S FIELD OFFICE

- .1 If required by the Contractor, provide a field office building adequate in size and accommodation for all Contractor's offices, superintendent's office, supply, and tool room throughout the entire construction period.
- .2 The Contractor's field office shall be at a location approved by the Town.

- END OF SECTION 01 52 00 -

1.0 General

- .1 All products, material, and equipment supplied and installed shall be new.
- .2 All products, material, and equipment supplied shall conform to these specifications and to all applicable standards.
- .3 Workmanship shall be the best quality, executed by workmen experienced and skilled in their respective trades.
- .4 Ensure full cooperation among all trades and coordination of the Work with continuous supervision.
- .5 Use products for which replacement parts and service are readily available.
- .6 Use products of one manufacturer for products of the same type or classification. Do not mix different manufacturer's products in the Work or in parts of the Work.
- .7 Refer to Section 3.0 – Products of the General Conditions for additional general requirements related to products, material, and equipment.

2.0 Manufacturer's Instructions

- .1 Unless otherwise specified, comply with the manufacturer's or Supplier's instructions for products, material, and equipment, and comply with instructed installation methods.
- .2 Notify the Town in writing of any conflict between these specifications and the instructions of the manufacturer or Supplier.

3.0 Delivery and Storage

- .1 Deliver, store, and maintain packaged products, material, and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage and soiling of products, material, and equipment.
- .3 Store products, material, and equipment in accordance with instructions of the manufacturer or Supplier.
- .4 Comply with Workplace Hazardous Materials Information Systems (WHMIS) requirements.
- .5 Refer to Section 3.1 – Delivery and Storage of Products of the General Conditions for additional requirements related to delivery and storage of products, material, and equipment.

- END OF SECTION 01 61 00 -

1.0 GENERAL

1.1 References

- .1 Canadian Federal Legislation
- .2 Canadian Environmental Protection Act (CEPA).
- .3 Canadian Environmental Assessment Act (CEAA).
- .4 Transportation of Dangerous Goods Act (TDGA).
- .5 Motor Vehicle Safety Act (MVSA).

1.2 Storage and Protection

- .1 Perform all work in accordance with Section 01 41 00 – Regulatory Requirements.
- .2 Protect in accordance with Section 31 23 33 – Excavating, Trenching and Backfilling.
- .3 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to Owner.
- .4 Existing underground utilities: Establish the location of all underground utilities and have their location adequately marked. Obtain direction of Engineer before disturbing the utility lines.
- .5 Prevent movement, settlement or damage of adjacent surfaces and structures. Provide bracing and shoring required. Make good drainage and be liable for injury caused by demolition.
- .6 In all circumstances ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .7 Do not dispose of waste of volatile materials such as, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout the project.
- .8 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
- .9 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .10 Protect trees, plants and foliage on site and adjacent properties where indicated.

1.3 Regulatory Requirements

- .1 Ensure all work is performed in compliance with CEPA, CEEA, TDGA, MVSA, and all applicable provincial regulations.

1.4 Submittals

- .1 Prior to commencement of work on site submit details indicating anticipated percentages of reuse, recycling and landfill, schedule of selective demolition, material description and quantities of materials to be salvaged, number and location of dumpsters, anticipated frequency of tipping, and name and address of all haulers, waste facilities, waste receiving organizations.
- .2 Supply certified weigh bills from authorized disposal sites and reuse and recycling facilities for all material removed from site. Written authorization from the Engineer is required to deviate from the haulers facilities receiving organizations listed in waste reduction workplan.

1.5 Scheduling

- .1 Ensure project timelines are met without compromising specified minimum rates of material diversion. Notify Engineer in writing of delays.

2.0 PRODUCTS

2.1 Equipment

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

3.0 EXECUTION

3.1 Preparation

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

3.2 Sequences of Operation

- .1 Removal
 - a) Remove existing road structure as indicated on the drawings.
 - b) Do not disturb items designated to remain in place.
 - c) In removal of pavements, curbs and gutters:

- i) Square up adjacent surfaces to remain in place by saw cutting.
- ii) Protect adjacent joints and load transfer devices.
- d) When removing pipes under existing or future pavement area, excavate at least 300 mm below pipe invert.
- e) Decommission water wells and monitoring wells in accordance with municipal, provincial guidelines. regulations.
- f) Obtain written approval of Engineer prior to removal of any trees.
- g) All trees identified by Engineer to be healthy specified for removal are to be sold, donated or alternately disposed of. Grind, chip, or shred all other vegetation for mulching and composting.

.2 Removal From Site

- a) All material destined for alternate disposal must be hauled to authorized disposal site listed in waste reduction workplan. Deviation from waste reduction workplan must be approved in writing by Engineer.

.3 Salvage

- a) Items to be salvaged: granular base material as indicated on the drawings;
- b) Carefully remove/excavate items designated for salvage and stockpile salvaged materials at locations as indicated by the Engineer. Do not mix granular base material with underlying subgrade soil materials.

.4 Sealing

- a) Seal pipe ends and walls of manholes or catch basins as indicated.
- b) Securely plug to form watertight seal.
- c) Salvaged catchbasin frame and covers and savaged manhole covers shall be taken to the 46 Street Public Works storage lot.
- d) All other waste materials shall be the Contractors responsibility for disposal including but not limited to excess clay, sod, topsoil and debris.

.5 Backfill

- a) Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.3 Restoration

- .1 Items designated for restoration: asphalt pavement and granular road base.

- .2 Restore existing structures removed as indicated on the drawings.
- .3 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

- END OF SECTION 01 74 23 -

1.0 General

- .1 Maintain the working area in a clean and orderly manner as the Work progresses, and upon completion of construction, remove all waste materials, and all temporary facilities from the site.
- .2 Haul surplus or salvage materials that are the property of the Town to the Town's storage site.
- .3 Remove surplus or salvaged materials belonging to the Contractor from the site.
- .4 Clean haul routes.
- .5 Broom clean paved surfaces; rake clean other surfaces of ground.
- .6 Clean all catch basins, manholes, storm, and sanitary sewers of any foreign material that may have entered the system during construction. Ensure all accesses function smoothly.
- .7 Clean all tar, oil, or asphalt from manhole, catch basin, and valve hardware, and from all finished concrete surfaces.
- .8 Where the Contractor fails to complete cleanup to the satisfaction of the Town, the Town may elect to complete the required cleanup and deduct the cost of the such from any payment due to the Contractor in accordance with Section 7.1 – Town's Right to do Work of the General Conditions.

- END OF SECTION 01 74 23 -

1.0 General

- .1 As specified in other sections of the specifications, the Contractor is required to prepare and provide record drawings, to provide survey notes, to supply test results or other documents. Such information shall be turned over to the Town as soon as start-up is complete, and before the Construction Completion Certificate is issued.
- .2 Record documents shall be neat, legible and accurate.

2.0 Drawings of Record

- .1 The Contractor shall keep one complete set of all construction drawings on the Site.
- .2 On the Site set of Contract Drawings, the Contractor shall record any changes that are made during the actual construction of the Work. The purpose of recording these changes is to provide drawings of record at the end of the Work. The Contractor shall be responsible for the adequacy and the reliability of the information recorded on the drawings of record.
- .3 At the completion of the construction period, the Contractor shall turn over the set of construction drawings, which have been marked up with changes during the course of the Work to the Town to permit the Town to prepare Drawings of Record for the Work.

3.0 Confirmation from Approving Authorities

- .1 Provide written confirmation from any and all authorities having jurisdiction that the Work conforms to their requirements (i.e. Alberta Labour, Electrical Protection Branch, etc.).

- END OF SECTION 01 78 39 -

1.0 GENERAL

- .1 This item consists of preparatory work and operations including but not limited to those necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site.
 - a) Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities, project signage and all preparation for performing the Work.
 - b) Included in demobilization are preparation and submission of operation and maintenance manuals, removal of all personnel, materials and equipment; and cleanup of the site and the Work.
- .2 Related Sections
 - a) 00 73 00 – Supplementary Conditions
 - b) 01 11 00 – Summary of Work
 - c) 01 22 00 – Measurement and Payment
- .3 References
 - a) Contract Drawings

2.0 PRODUCTS

- .1 None

3.0 EXECUTION

- .1 Execution not specifically mentioned herein shall conform to requirements as set out in the References as attached within this Section.

- END OF SECTION 31 01 00 -

1 GENERAL

1.1 Description

- .1 This section pertains to all items related maintaining vehicular and pedestrian traffic adjacent to work areas while allowing work to progress in a safe and efficient manner.

1.3 References

- .1 Contract Drawings
- .2 Alberta Transportation's "Traffic Accommodation in Work Zones, 2nd edition, December 2018". This manual can be downloaded from [tawz2018-2.pdf \(alberta.ca\)](#)
- .3 Alberta Transportation's Standard Specifications for Highway Construction, Edition 16, 2019, Section 7.1 Traffic Accommodation and Temporary Signing. This manual can be downloaded from [Standard Specifications for Highway Construction Edition 16, 2019 \(alberta.ca\)](#)

2 PRODUCTS

- 2.1 Individual items used for traffic accommodation including but not limited to barriers, signs, and temporary paint markings, shall conform to material requirements set out within these specifications.
- 2.2 Items used that are not specifically mentioned herein shall conform to requirements as set out in the References above.

3 EXECUTION

3.1 Traffic Accommodation

- .2 The Contractor Shall submit a detailed Construction Staging Plan together with a detailed Completion/Construction Schedule, showing all tasks with corresponding durations, including temporary signing information for each phase of construction prior to the project's Pre-Construction meeting. A review of the provisions will be carried out by the Town and Engineer. The plan shall include, but not be limited to:
 - a) Construction area
 - b) Location of flagpersons
 - c) Temporary Signage
 - d) Barriers and delineators
 - e) Closures
 - f) Lane direction
 - g) Pedestrian / cyclist accommodations
 - h) Temporary resident and business access and signage

- .3 The Town and Engineer shall retain the right during the duration of construction activities to suggest and enforce modifications to the plan based on observed performance once implemented. The Contractor shall then adjust traffic accommodation measures as directed by the Engineer.
- .4 The Contractor shall supply and install a minimum of two (2) Variable Message Sign (VMS) boards at each of the Project Limits (locations to be determined) at least ten (10) days in advance of the start of construction in order to advise local citizens and commuters of possible traffic delays and lane closures due to the Work.
- .5 The Contractor shall supply and install project signs / information signs as per Section 00 73 00 Supplementary Conditions.
- .6 All traffic control measures must allow for (to the satisfaction of the Engineer):
 - a) Appropriate temporary advanced warning signs;
 - b) Appropriate protection of vehicles to the delineated work zone; and
 - c) Accessibility to all side streets where possible.
- .7 The Contractor will be entitled to a full road closure for the duration of the project while work is being completed on site.
- .8 The Engineer will have the authority to restrict the hours of work during heavy traffic periods or on days of special events put on by the Town.
- .9 All public intersections outside the work zone shall be available for accommodation of unrestricted public traffic including pedestrian access, where applicable, during all times. Over-dimensional vehicles and emergency vehicle requirements through the area shall be accommodated during all times.

The Contractor will schedule his work to minimize traffic delays. Parking of the Contractor's vehicles, equipment or plant on the roadway or shoulder outside the work zone will not be permitted at any time.
- .10 The Contractor will not operate his equipment against the direction of traffic flow.
- .11 Roadway surfaces outside the work zone will be kept clean of debris. Debris spilled, tracked or otherwise deposited onto the roadway surface as a result of the Contractor's operations will be removed immediately. Travel lanes, shoulders and adjacent areas are to be kept clear of windrowed, piled or loose materials so that the roadway surfaces are clean and drainage from the roadway can be maintained. Areas of ponding water on or adjacent to the roadway due to construction operations shall be corrected immediately.
- .12 The Contractor is reminded that Other Forces will be present on site during the implementation of the Work. It is the Contractor's responsibility to determine the scope and schedule of work by Other Forces, and coordinate his work with that of the Other Forces.
- .13 The Contractor will install and maintain a temporary fence surrounding the work area for the duration of the project.

3.2 Flagpersons

- .1 Where appropriate, flagpersons shall be properly trained and have accreditation from the Alberta Construction Safety Association.
- .2 Flagpersons shall be attired in high visibility clothing in accordance with CSA Z96-02.

3.3 Record Keeping

- .1 The Contractor shall prepare and submit a short written document of safety and work procedures that adequately describes how all work items will be completed while safely accommodating public users in the vicinity of the Work. Specific mention should be made toward accommodating emergency vehicles.
- .2 The Contractor shall maintain a written record of all traffic control devices used on site and monitor them no less than twice daily. Records should note the device being used, location, time it was checked, the personnel performing the checks, and any notes or concerns about its condition.
- .3 All signs shall be laid down or covered when not in use.

- END OF SECTION 31 02 00 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for excavation, fill, grading, and compacting for construction of subgrade and base course for pavement structures.

1.2 Definitions

- .1 Common Excavation: Includes topsoil, clay, silt, sand, gravel, and peat within the area of the Work.
- .2 Borrow Material: Includes select topsoil, clay, sand, gravel, or other material imported from outside the Site for use as fill in the Work.
- .3 Unsuitable Material: Includes peat, roots, stumps, topsoil, frozen soil, garbage, or other material deemed unsuitable for fill by the Town.
- .4 Fill: An earth structure built up by successive lifts of a specified material at specified densities.
- .5 Prepared Subgrade: The soil immediately beneath a pavement structure that has been prepared as specified for the construction of a pavement structure.

1.3 Quality Control

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Submit a copy of scale certificates prior to use.

1.4 Quality Assurance

- .1 The Town shall be advised of all borrow material sources a minimum of 5 days prior to delivery to allow scheduling of inspection by the Town.
- .2 For granular material, provide sieve analyses, to ASTM-C136, and other test results as necessary to clearly demonstrate that the aggregate being supplied for the Work meets the specified requirements. Conduct a minimum of one sieve analysis for each 1,000 tonnes of aggregate supplied.
- .3 Provide moisture/density curves for each type of material from each source of material to be compacted to a specified density. Moisture/density curves to ASTM-D698. The maximum density shall be the dry unit mass of a soil sample at optimum moisture content as determined in accordance with ASTM-D698 Method A.
- .4 For fill, conduct a minimum of one field density test for each 2,000 m² of compacted lift, unless otherwise specified or directed by the Town. Field densities to ASTM-D2167 or to ASTM-D2922 for comparison with the corresponding maximum density as specified in Article 1.4.2.
- .5 For subgrade, conduct a minimum of one field density test for each 1,000 m² of compacted lift, unless otherwise specified or directed by the Town. Field densities to ASTM-D1556, ASTM-D2167, or ASTM-D2922 for comparison with the corresponding maximum density as specified in Article 1.4.2.

- .6 For base course, conduct a minimum of one field density test for each 500 m² of compacted lift, unless otherwise specified or directed by the Town. Field densities to ASTM-D1556, ASTM-D2167, or ASTM-D2922 for comparison with the corresponding maximum density as specified in Article 1.4.2.
- .7 If a required field density test result is less than that required, three additional tests shall be carried out for the area represented by the failed test. The average of the three additional tests shall be taken to represent the density of that area. If this average is still less than required, the area shall be re-worked to the full depth of the lift, the soil moisture altered as necessary, re-compacted, and re-tested until the specified density is achieved. Alternatively, if the area represented by a failed field density test is immediately reworked and recompacted, the area shall be tested at normal frequencies.
- .8 The Contractor shall perform as many tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the minimum number specified.

1.5 Disposal

- .1 All materials on site whether stockpiled, stored, or excavated are the property of the Town, and the Town reserves the right to keep any part or all of the material.
- .2 Remove and dispose of surplus materials as directed by the Town.
- .3 The Contractor shall dispose of all waste materials at sites to be located by the Contractor and approved by the Town.
- .4 Refer to Section 01 52 00 – Construction Facilities for further requirements.

1.6 Related Work

- .1 None.

2.0 PRODUCTS

2.1 Fill

- .1 The Town shall determine the suitability of materials at the site for use as fill material.
- .2 Suitable borrow material may be required for use as fill material where sufficient material is unavailable at the site or where material at the site is unsuitable for use as fill material, as determined by the Town.

2.2 Subgrade

- .1 Material for subgrade shall be compacted clay soil, free of deleterious material, and subject to the approval of the Town.

2.3 Granular Materials

- .1 Granular materials to be in accordance with Section 34 02 00 – Aggregates.

2.4 Equipment

- .1 Grading equipment capable of spreading and trimming soil to the specified depth.
- .2 Compacting equipment capable of compacting soil as specified.
- .3 Any other equipment necessary to complete excavation, fill, grading, and compacting as specified.

3.0 EXECUTION

3.1 Preparation of the Site

- .1 Maintain slopes and adequate drainage during grading.
- .2 Do not allow mixing of different fill materials.
- .3 Locate, mark, and protect all utilities and appurtenances (i.e. manholes, catch basins, valves, and hydrants).
- .4 Locate and protect all existing trees and shrubs.
- .5 Protect completed portions of the work from damage. Repair damaged areas as required.

3.2 Excavation

- .1 Excavate the area to the required cross-section to the required subgrade elevation.
- .2 Where excavation exposes unsuitable materials below the subgrade and the Town directs removal, excavate such materials using transition slopes no steeper than 10% along the alignment profile. Make the bottom of the cut level, with no loose material.
- .3 Where over-excavation occurs, reinstate grades by backfilling, compacting, and re-grading as directed by the Town. Where over-excavation is not directed or authorized by the Town, the Contractor shall restore grades at its sole expense.
- .4 Excavate rock and haul to disposal areas.
- .5 Excavate unsuitable material and haul to disposal areas.

3.3 Fill and Grade

- .1 Place and spread fill material in successive horizontal lifts.
- .2 Compact each lift to a minimum 98% Standard Proctor Density, unless otherwise specified or directed by the Town.
- .3 Each lift shall not exceed 150 mm in compacted thickness.
- .4 Trim sideslopes from top down, and finish true to the required alignment, grade, and shape.
- .5 Grades shall be within 30 mm of design grades.

- .6 Trim high areas, scarify low areas, compact, and re-grade as required to achieve specified grades and compaction.
- .7 Ensure crossfalls and ditch bottoms are graded to promote positive drainage flow.

3.4 Subgrade Preparation

- .1 Scarify and loosen subgrade to a depth of 150 mm, or as otherwise specified or directed by the Town.
- .2 Work the subgrade until the soil is pulverized into pieces no larger than 25 mm across, exclusive of stones.
- .3 Scarify, shape, and compact the subgrade as follows:
 - a) Compact the subgrade to a minimum of 100% of the maximum density for each 150 mm lift of subgrade under road, curb, gutter, curb ramps, alley crossings, and access crossings.
 - b) Compact the subgrade to a minimum of 98% of the maximum density for each 150 mm lift of subgrade under walks.
- .4 The required compaction can generally best be achieved when the soil is within 3% of the optimum moisture content just prior to compacting. The Contractor may dry or moisten the granular material as necessary to achieve the optimum moisture content.
- .5 Leave the surface of the compacted subgrade slightly higher than the required elevation; then trim to the required elevation.
- .6 Total compacted thickness shall be 150 mm.
- .7 Leave the finished surface even and free of depressions, humps, loose debris, and foreign material.
- .8 Finished subgrade surface shall be within 6 mm above the specified elevation or within 25 mm below the specified elevation. Trim any high spots and refinish to meet tolerance. Add approved material to low spots, scarify, and blend to the full subgrade depth, recompact to the required density, and refinish.
- .9 Proof roll the finished subgrade to confirm adequate bearing capacity of the subgrade soils. The proof roll shall be supervised by the Town and conducted in accordance with the Town's recommended procedures, as applicable.

3.5 Base Course

- .1 If an existing subgrade is deemed acceptable by the Town, is on the designated grade, and contains sufficient depth of granular material, remove rocks larger than 75 mm, scarify the base to 75 mm depth, and pulverize the material into pieces no larger than 50 mm.
- .2 If an existing subgrade is deemed acceptable by the Town, is on the designated grade, but contains insufficient depth of granular material, remove rocks larger than 75 mm, scarify the base to 50 mm depth, pulverize the material into pieces no larger than 50 mm, add sufficient imported granular material to meet the designated grade, and thoroughly mix.

- .3 If an existing subgrade is deemed unsuitable by the Town or not on the designated grade, windrow any suitable granular material to one side of the working area and rework the subgrade as specified in Article 3.4.
- .4 Store granular material in suitable stockpiles at the site. When stockpiling, avoid segregation of particle sizes. Provide weather protection on stockpiles where directed by the Town.
- .5 Provide the Town with a scale tickets for each aggregate load delivered to the site. Scale ticket forms shall be subject to the approval of the Town.
- .6 The Town shall inspect subgrade prior to placement of the base course.
- .7 Place granular material and spread uniformly in lifts not exceeding 150 mm in thickness when compacted.
- .8 Scarify, shape, and compact the base course as follows:
 - a) Compact the base course to a minimum of 100% of the maximum density for each 150 mm lift of base course under road, curb, gutter, curb ramps, alley crossings, and access crossings.
 - b) Compact the base course to a minimum of 98% of the maximum density for each 150 mm lift of base course under walks.
- .9 The required compaction can generally best be achieved when the granular material is within 3% of the optimum moisture content just prior to compacting. The Contractor may dry or moisten the granular material as necessary to achieve the optimum moisture content.
- .10 Leave the surface of the compacted base slightly higher than the required elevation; then trim to the required elevation.
- .11 Total compacted thickness shall be in accordance with the Drawings.
- .12 Leave the finished surface even and free of depressions, humps, loose debris, and foreign material.
- .13 Finished granular base surface shall have maximum 15 mm variation under a 3 m straightedge, and shall be within 6 mm above the specified elevation or within 15 mm below the specified elevation. Trim any high spots and refinish to meet tolerance. Add approved material to low spots, scarify, blend to the full subgrade depth, respread, recompact to the required density, and refinish.
- .14 If segregation occurs, blade the lift and mix thoroughly before spreading and shaping to grade.

3.6 Protection

- .1 Do not permit traffic over prepared surfaces.
- .2 If the site floods, immediately drain the surface by natural flow or by pumping to catch basins, manholes, or ditches, as directed and authorized by the Town.
- .3 The Contractor shall repair any damaged areas to the satisfaction of the Town, at the Contractor's sole expense.

3.7 Cleanup

- .1 Remove and dispose of all debris and excess material at a site, and in a manner acceptable to the Town.
- .2 Maintain the site and areas adjacent to the site in a condition acceptable to the Town, and in accordance with other applicable requirements of the Contract Documents.

- END OF SECTION 31 23 00 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for trenching for underground utilities.
- .2 This section specifies requirements for trenching and backfilling, including:
 - a) Site preparation;
 - b) Excavation;
 - c) Support of the adjoining ground or structures;
 - d) Stockpiling and disposal of excess excavated material;
 - e) Control of surface and subsurface water in trenches;
 - f) Temporary railings, coverings, and enclosures to excavations;
 - g) Removal and replacement of unsuitable material;
 - h) Backfilling; and
 - i) Surface restoration.

1.2 Quality Assurance

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Submit to the Town a list of sources of materials including sand, gravel, borrow materials, and concrete aggregates.
- .3 Provide samples, test results, sieve analyses, and reports for preliminary approval of materials.
- .4 Where fillcrete is used, submit mix design to the Town for approval at least ten (10) days prior to production.
- .5 Preliminary approval of materials does not constitute general acceptance. Acceptance depends upon satisfactory field test results and performance in place.

1.3 Quality Control

- .1 Moisture density curves for granular soils to ASTM-D698.
- .2 One Point moisture density relation for native backfill to ATT-20/2022.
- .3 Sieve analyses to ASTM-C136.
- .4 Field densities to ASTM-D2167 or to ASTM-D2922.
- .5 Field densities shall be at a frequency of one test per 25 m of trench per lift.
- .6 Provide moisture/density curves for each type of granular material from each source of material to be compacted to a specified density.
- .7 For granular trench backfill, conduct a minimum of one Standard Proctor and one sieve for every 5,000 tons of gravel or upon material change.

- .8 For native trench backfill, conduct a minimum of one One Point moisture density test of each test for every 50 m of trench per lift.
- .9 For fillcrete:
 - a) Slump tests, to CSA-A23.2-1C and CSA-A23.2-5C, to be taken between the 10% and 90% points of discharge of a fillcrete load, with every strength test, and as required by the Town.
 - b) Air content tests, to CSA-A23.2-1C and CSA-A23.2-4C, to be taken between the 10% and 90% points of discharge of a fillcrete load, with every strength test, and as required by the Town.
 - c) Strength tests, to CSA-A23.2-3C and CSA-A23.2-9C, to be conducted once per day per supplier, or as required by the Town.
- .10 The Contractor shall perform as many tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the minimum number specified.

1.4 Disposal

- .1 All materials on site whether stockpiled, stored, or excavated are the property of the Town, and the Town reserves the right to keep any part or all of the material.
- .2 The Contractor shall dispose of all waste materials at sites to be located by the Contractor and approved by the Town.
- .3 Refer to Section 01 52 00 – Construction Facilities for further requirements.

1.5 Related Sections

- .1 Section 33 31 00 – Sanitary Utility Sewerage Piping

2.0 PRODUCTS

2.1 Gravel

- .1 Gravel material to Section 34 02 00 Aggregate, as indicated on the drawings.

2.2 Native Fill

- .1 Material excavated from trench excavation and approved by the Town. Fill material shall be free of stones larger than 200 mm, organic material, and other deleterious material.

2.3 Imported Fill

- .1 Imported backfill material for trenches shall be free from organic material or any perishable or objectionable material that would prevent proper consolidation.

2.4 Sand

- .1 Pipe bedding sand material to Section 34 02 00 Aggregate, as indicated on the drawings.

2.5 Filter Cloth

- .1 Non-woven polyester in accordance with CGSB-148.1, 175 g/m², 1.7 mm thickness. Submit product data to Town for approval.

3.0 EXECUTION

3.1 Site Preparation

- .1 Inspect and record the condition of existing buildings and surface features which may be impacted by construction. Submit to Town prior to construction.
- .2 Protect all existing features within and along the trench alignment from damage due to construction activities. Excavations shall not encroach on normal 45° bearing support under any foundation without suitably designed and installed temporary support measures.
- .3 Clear the surface of the ground or road within the working area.
- .4 Dispose of refuse in a manner satisfactory to the Town.
- .5 Precutting Paved Surfaces
 - a) Refer to Section 32 01 00 – Sawcutting of Asphalt Pavement.
 - b) Cut pavement in straight lines parallel to the trench centreline.
 - c) Cut width shall not exceed the specified maximum trench width at ground surface.
 - d) Prevent the destruction of pavement in excess of the allowable width, by supporting the trench, by sheeting or other means.
 - e) Cutting pavement in excess of the allowable width is allowed if the nature of the soil is such that sheeting of the trench wall is impractical.
 - f) Dispose of cut pavement.
 - g) Where, in the opinion of the Town, the existing pavement is of such condition that precutting of pavement is not necessary, the pavement may be cut by trenching equipment upon receipt of written permission from the Town.

3.2 Excavation

- .1 Depth
 - a) Excavate the trench to a depth sufficient to lay the pipe as shown on the Drawings.
 - b) If any part of the trench bottom is excavated in error below the specified grade, correct with approved materials compacted as specified under Article 3.4 - Pipe Bedding, at the Contractor's expense.
- .2 Width
 - a) Excavate trench width at the bottom such that the pipe can be laid and jointed as specified and backfill placed and compacted as specified.

- b) Trench width dimensions are described in the specifications for installation of the pipe and on the Drawings. Trench width is to be minimized by utilizing trench boxes and confined to the asphalt surface.
- c) Increase trench widths to allow placing of timber supports, sheeting and bracing, but do not exceed the maximum trench width shown on Drawings.
- d) Make trench walls vertical to 300 mm above the top of the pipe and maintain widths above this level within limits shown on the Drawings or in accordance with safety regulations.
- e) Pipe design is dependent upon the type of bedding specified and the class of backfilling in the pipe zone, as well as the width of the trench. If the Contractor uses trenching equipment or trenching methods that result in a wider trench than specified under the installation of pipe, then corrective work shall be performed as required by the Town, at the Contractor's expense. The corrective work may take the form of either or both of the following:
 - i) Supply and installation of a higher class of bedding and backfilling in the pipe zone.
 - ii) Supply and installation of a stronger class pipe.

.3 Length

- a) Excavate trenches only as far in advance of pipe laying as safety and traffic conditions permit and as far as the Town shall allow. The Work shall be completed in phases which ensure a minimum of one vehicular access to businesses is kept open.
- b) For arterials and collector roads the maximum length of open trench excavation ahead of pipe laying is 15 m.
- c) For residential roads, service roads, lanes, boulevards, and non-paved areas the maximum length of open trench excavation ahead of pipe laying is 30 m or business accesses whichever is less.

.4 Excavate so that the pipe can be laid to the line and grade as shown on Drawings, or as established by the Town.

.5 Stockpile material excavated alongside the trench in authorized working areas in a manner that will not endanger the work, hinder pedestrian or vehicle traffic, block surface drainage or obstruct access to other utilities. Where excavated material cannot be piled along the trench in compliance with the above restrictions, remove it from the site and stockpile at an acceptable location for return to the trench for backfilling. Do not stockpile excavated material over existing pipelines.

.6 Windrow reusable gravel and keep it separate from the remainder of the excavated material so that it can be replaced when the backfilling operation has been completed.

.7 Dispose of waste or surplus material as per Article 1.4 - Disposal.

- .8 Keep excavations dry while work is in progress. Protect excavations against flooding and damage from surface runoff and/or groundwater.
- .9 The expense of removing water from trenches, regardless of origin, is the responsibility of the Contractor.
- .10 Obtain all necessary approvals prior to discharging water to surface drains, watercourses, or drainage areas.
- .11 Common Excavation
 - a) Excavation of materials, with the exception of surface gravel, pavement, or rock, is classified as common excavation.
 - b) In ledge rock, boulders, or large stones, over-excavate 150 mm below the pipe level.
- .12 Unsuitable Material
 - a) Unsuitable material is material in the trench at subgrade that is unstable or which contains ashes, cinders, organic material, or large pieces of inorganic material, or is otherwise unsuitable, and which, in the judgment of the Town, should be removed.
 - b) Excavate and remove unsuitable material to a width and depth ordered by the Town. Backfill the subgrade with an approved material compacted in 150 mm lifts to provide a continuous bearing for pipes. Replacement material shall be washed rock, pit-run gravel, or well-graded sandy gravel.
 - c) Disposal of unsuitable material shall be in accordance with Article 1.4 - Disposal.
 - d) Payment will be made for removal and replacement of unsuitable material if the Town orders the work.
 - e) Material that becomes unstable or unsuitable through the Contractor's failure to divert surface water or control ground water in the trench shall be excavated and removed as waste material and replaced with approved material at the expense of the Contractor.
- .13 Hand Trenching, Tunneling, Boring, and Augering
 - a) Employ hand trenching, tunneling, boring, or augering methods where specified on the Drawings or ordered by the Town.
 - b) Submit complete details regarding tunneling, boring or augering methods proposed in writing to the Town, and do not commence work until after the Town has advised in writing that the work may proceed.
- .14 Temporary Protective Structures
 - a) Temporary protective structures, bracing, shoring and sheeting are the responsibility of the Contractor and shall be designed by a Professional Engineer registered in Alberta.
 - b) Observe safety regulations of the Occupational Health and Safety Act with regard to protection of the work, property, and structures adjacent to the Work and maintenance of the trench widths.

- c) Where closed sheeting is required it shall be installed such that adjacent soil cannot enter the trench either below or through sheeting.
 - d) Moveable trench cages may be used in lieu of conventional shoring, provided they comply with all applicable safety regulations and permit installation of the pipe, bedding, and pipe zone material as specified.
 - e) Increase trench widths as necessary to allow placing of supports, sheeting, and bracing, but do not exceed the maximum trench widths shown on the Drawings, or provide for corrective measures.
 - f) Where damage to adjacent structures will not result, remove temporary protective structures and backfill as specified for the pipe zone and the trench.
 - g) Leave temporary structures in place where damage to adjacent structures may result, or if directed by the Town.
- .15 Special Supports
- a) Construct special supports of timber, concrete or other material, as ordered by the Town, where the bottom of the trench is unstable and over-excavation is judged by the Town to be uneconomical.
- .16 Interfering Services
- a) Provide for the uninterrupted flow of all watercourses, sewers, and drains encountered during the work.
 - b) Support existing water mains, sewer pipes, gas lines, and other pipes to protect them from damage.
 - c) Repair and make good at the Contractor's expense any damage which may occur to any water main, sewer pipe, gas line, or other pipe and to any electrical conductor, cable, sidewalk, curb, or structure.
 - d) Determine the locations of all structures, pipes, manholes, and valves by contact with the Town and the examination of Drawings. If necessary, explore and excavate for such purposes.
 - e) Remove abandoned utility service lines encountered in areas of construction. Cap, plug or seal abandoned lines and record locations on Drawings of Record.

3.3 Trench Crossings

- .1 Existing pipelines shall be exposed by hand digging or hydro-vacuuming. No mechanical excavation shall be undertaken within 1.0 m of the anticipated location of an existing pipeline. Hydro-vacuuming is the preferred method of confirming the location of existing utilities near the surface.
- .2 Give notice to the Town of pipeline crossings at least 48 hours prior to commencement of work on pipeline crossings. Excavation cannot commence until a representative of the pipeline to be crossed has properly located the pipeline.

- .3 Refer to Article 4.0 of Section 01 52 00 – Construction Facilities for additional requirements.

3.4 Pipe Bedding

- .1 Pipe bedding shall be in accordance with the Drawings and with the specifications for installation of the pipe.
- .2 Do not proceed with placing pipe bedding until the Town has inspected the trench.

3.5 Backfilling in the Pipe Zone

- .1 The pipe zone is defined as that part of the trench from the bottom of the pipe bedding to 300 mm above the top of the pipe or above the top of the highest pipe in a combined trench.
- .2 Backfilling in the pipe zone shall be in accordance with the Drawings and with the specifications for installation of the pipe.

3.6 Trench Backfill

- .1 Trench backfill is defined as backfill above the pipe zone.
- .2 Do not proceed with trench backfill until the Town has inspected and approved the bedding and backfill in the pipe zone.
- .3 Place backfill in a dry trench.
- .4 Place backfill by rolling down a slope in the trench or lower by machine. Prevent backfill from dropping vertically.
- .5 Backfill as close as possible to pipe laying operations so that trenches are left open no longer than absolutely necessary.
- .6 Protect all open excavations when construction is not ongoing with fencing, barricades, flashing lights, etc. and provide watchmen for site security and public safety if required by the Town.
- .7 There shall be no open trench permitted at the end of the last working day prior to weekends or holidays.
- .8 Plan the backfilling operation so that exposure of the backfill material to frost is kept to a minimum. Use no large frozen chunks of soil as backfill.

3.7 Classes of Backfill

- .1 Class I (Arterials and Collector Roads)
 - a) Place native backfill soils in uniform 150 mm lifts over the whole width of the trench, each lift compacted to 100% of the One Point proctor by ATT-20/2022.
 - b) Remove all surplus excavated material and stockpile on site as directed, or dispose of it as directed by the Town.
 - c) Bring the native backfill up to the original subgrade elevation.

- d) Place granular fill and asphalt pavement structure materials.
- .2 Class II (Residential Roads, Lanes and Non-Paved Areas)
- a) Place native backfill material in uniform lifts not exceeding 150 mm over the width of the trench, each lift compacted using mechanical compaction equipment. Compact each lift to 100% of the One Point proctor by ATT-20/2022.
 - b) Backfill material shall be free of wood, brush, or other perishable, objectionable material. No rocks larger than 200 mm shall be present in the backfill material.
 - c) The moisture content of the backfill material shall be controlled by the Contractor as necessary to achieve compaction as specified, and at the Contractor's expense. Supply and add water if it is necessary to increase moisture content.
 - d) Where, in the opinion of the Town, the excavated material is unsuitable for backfilling purposes, the Contractor shall, upon written order from the Town, use imported material.
 - e) Where the excavation is carried out on a gravel road, bring the compacted excavated material up to the base of the surface gravel and place surfacing gravel to match the existing surface.
- .3 Fillcrete
- a) Uniformly place fillcrete from the top of bedding to the designated or pre-existing subgrade elevation.
 - b) Protect fillcrete from freezing or other adverse weather conditions for a minimum of 24 hours following placement.
 - c) Fillcrete that is exposed to significant infiltration of water within 24 hours of placement must be removed and replaced.
 - d) A minimum of 150 mm of granular base course must be placed on the fillcrete surface before allowing any vehicular traffic over the fillcrete. Granular base course may be placed 24 hours following the placement of the fillcrete.
- .4 Backfilling Tunnels and Boreholes:
- a) Backfill all voids around carrier pipe or, if there is a casing, backfill all voids around the casing with sand placed manually, mechanically, or pneumatically.
 - b) Alternatively, the Contractor may pressure grout voids or fill them with urethane foam.
 - c) Seal both ends of casings.

3.8 Cleanup

- .1 Clean up and dispose of all excess material, trash, rocks, boulders, and debris as work progresses and in accordance with Article 1.4 - Disposal.

- .2 Refer to Section 01 74 23 – Final Cleaning for additional requirements.

3.9 Restoration

- .1 Restore or replace all sidewalks, curb, gutter, shrubs, fences, poles, roads, or other property and surface structures damaged or removed during the course of the work to a condition equal to that before the work began, furnishing all labour and materials at the Contractor's expense.
- .2 Restore trench surfaces to their original level and conditions after backfilling or as detailed on the Drawings.
- .3 Restore all public roads, temporary access roads, and stockpile and storage sites to a condition at least equal to that in which they were found.
- .4 Restore other working areas that were affected by the construction operation by re-grading, re-gravelling, and/or pavement repair as necessary to restore these surfaces to their original level and condition.

3.10 Trench Settlement During Warranty Period

- .1 During the Warranty Period, the Contractor shall replace materials and rectify all failures that occur as a result of settlement of trench backfill or collapse of trench walls.
- .2 Trenches in which backfill settles shall be refilled with the specified backfill material. Paved surfaces that are adjacent to trenches or on trench backfill, which fail during this period, shall be replaced or repaired in an approved manner.
- .3 Replacement of materials and rectification of failures that occur as a result of settlement of trench backfill or collapse of trench walls, are entirely the responsibility of the Contractor and such repair work shall be done at the Contractor's expense.

3.11 Maintenance During Warranty Period

- .1 During the Warranty Period, the Contractor is responsible for extra road maintenance required as a result of trench settlement or disruption of surface drainage.
- .2 The Contractor shall coordinate this extra maintenance with the normal maintenance provided by the Town and make whatever arrangements that may be required with the Town.

1.0 GENERAL

1.1 Not Used.

2.0 PRODUCTS

2.1 Road Geotextile

- .1 The synthetic geotextile shall consist of a durable, permeable, non-woven, polypropylene fabric composed of continuous synthetic filaments and meet the following ASTM properties:

Grab Tensile Strength	712 N as per ASTM D4832
Elongation (Failure)	50%
Puncture Strength	275 N
Burst Strength	2.1 MPa
Trapezoidal Tear	267N as per ASTM D4533

- .2 Road geotextile shall be Nilex 4551, Layfield 6D1, or approved equivalent.

3.0 EXECUTION

3.1 Placement of Geotextile

- .1 The surface to receive the granular subbase shall be smooth, well dressed and prepared with the road geotextile.
- .2 The areas to be covered by the road geotextile shall be trimmed and dressed to the lines and grades shown on the Drawings or as required by the Consultant.
- .3 The road geotextile shall be placed on the dressed surfaces to cover the areas that are to receive the granular subbase. The fabric shall be overlapped a minimum of 500 mm at all joints to provide a full, continuous mat and shall be laid smooth and free of tension, stress, folds, wrinkles or creases. The geotextile may be overlapped as specified or sewn at the seams to the manufacturer's instructions.
- .4 Care shall be taken not to puncture the geotextile when placing the granular subbase. Any damaged geotextile shall be repaired or replaced as requested by the Consultant.

1.0 GENERAL

1.1 Description

- .1 .1 This section includes the product specification of Biaxial Geogrid BX1200

1.2 References

- .1 American Society for Testing and Materials (ASTM)
- a) ASTM D6637-10
 - b) ASTM D7737-11
 - c) ASTM D7748-12
 - d) GRI GG9
 - e) ASTM D5818
 - f) ASTM D6637
 - g) ASTM D4355-05
 - h) ASTM D4759-02

1.3 Mill Certificates

- .1 Submit to Consultant copies of mill test data and certificate at least 4 weeks prior to start of work.

1.4 Delivery and Storage

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

2.0 PRODUCTS

2.1 Material

- .1 Biaxial Geogrid shall be Polypropylene for base reinforcement and subgrade improvements supplied in rolls.
- .2 Open grid polymer having bi-axial orientation, free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.
- .3 Aperture size: 20 mm
- .4 Polymer: polypropylene: to ASTM Standards with inhibitors added to resist deterioration by ultra-violet and heat exposure
- a) Width: 4.0 m minimum.
 - b) Length: 50 m minimum.
 - c) Seams: lapped in accordance with manufacturer's recommendations.

- .5 Physical properties – Polypropylene:
 - a) Tensile strength and elongation (in any principal direction): to ASTM Standards.
 - b) Acceptable Material: Integrally formed Biaxial Geogrid BX1200 by Tensar or approved equivalent. Load transfer mechanism shall be positive mechanical interlock.

3.0 EXECUTION

3.1 Installation

- .1 Place geogrid material by unrolling onto graded surface in manner and locations indicated and retain in position in accordance with manufacturer's written recommendations.
- .2 Place geogrid on sloping surfaces in one continuous length from lower limit to upper extent of geogrid.
- .3 Place Geogrid material smooth and free of tension stress, folds, wrinkles and creases.
- .4 Overlap each successive strip of Biaxial geogrid 900 mm over previously laid strip. Connect strips using zip-ties at every 300 mm in each direction.
- .5 Join successive strips of Geogrid as per manufacturer's recommendation
- .6 Protect installed Geogrid material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within 10 days of placement.
- .8 Replace damaged or deteriorated Geogrid to approval of Consultant.

3.2 Protection

- .1 Do not permit the passage of any vehicle directly on Geogrid at any time.

- END OF SECTION 31 32 19.13 -

1.0 GENERAL

- .1 The Contractor shall saw-cut the existing pavement structure to provide a clean, straight vertical face for future adjoining pavement structure lifts and to facilitate the removal of concrete and asphalt slabs as shown on the Drawings.
- .2 The depth of the sawcut varies and the Contractor is advised to refer to the Drawings or the Geotechnical Report and borehole logs for this information.
- .3 All costs associated with removal, loading, hauling and disposal of excavated materials shall be considered incidental to the work. All material removed shall become property of the Contractor, unless otherwise indicated by the Town.
- .4 Related Sections
 - a) 01 11 00 – Summary of Work
 - b) 01 22 00 – Measurement and Payment
 - c) 32 02 00 – Asphalt Removal
 - d) 32 04 00 – Concrete Removal
- .5 References
 - a) Contract Drawings

2.0 PRODUCTS

- .1 None

3.0 EXECUTION

- .1 Sawcut the limits of concrete or asphalt as indicated on the Contract Drawings, or as directed by the Town.
- .2 Sawcut the concrete or asphalt to a depth necessary to produce a straight, clean, and vertical edge to the full depth of the existing paving structure.
- .3 Re-sawcut if the edge is not straight, clean, and until new concrete paving is placed against the sawcut edge.

- END OF SECTION 32 01 00 -

1 GENERAL

1.0 Description

- .1 This section specifies requirements for existing concrete removal to include, but not limited to, curb & gutter and surface (sidewalk and slab-on medians).

1.1 Definitions

- .1 Concrete Curb Removal: Removal of the existing curb & gutter and all associated materials, where indicated on the Drawings.
 - a) The depth of the removal from back of curbing to lip of gutter beyond what is visually inspected may vary.
 - b) Any and all saw-cuts associated with the removal of the existing pavement structure surrounding the slab-median, if necessary and all other associated materials in conjunction with its removal, such as existing rebar, will be considered incidental to this project's Work.
- .2 Concrete Surface Removal: Removal of the existing concrete slab-on median portion above of the existing pavement structure and removal of the existing concrete sidewalk, where indicated on the Drawings.
 - a) The depth of the removal beyond what is visually inspected may vary and the Contractor is advised to refer to the attached Geotechnical Report for further this information.
 - b) Any and all other associated materials in conjunction with its removal, such as existing rebar, will be considered incidental to this project's Work.

1.2 Related Sections

- .1 01 11 00 – Summary of Work
- .2 01 22 00 – Measurement and Payment
- .3 32 01 00 – Sawcutting of Asphalt Pavement
- .4 32 02 00 – Asphalt Removal

1.3 References

- .1 Contract Drawings.

2 EQUIPMENT

- .1 Sawcutting or chisel hammer-type equipment should be of suitable size and capacity to efficiently complete the Work.
- .2 Drop hammer-type breaking equipment for concrete paving removal is strictly prohibited.
- .3 Excavation and hauling equipment should be suitable for the size of the operation.

3 EXECUTION

3.1 Sawcutting

- .1 Sawcut the limits of concrete paving removal as indicated on the Contract Drawings, or as directed by the Town
- .2 Sawcut the concrete paving to a depth necessary to produce a straight, clean, and vertical edge to the full depth of the existing paving structure.
- .3 Re-sawcut if the edge is not straight, clean, and vertical until new concrete paving is placed against the sawcut edge.

3.2 Breaking

- .1 Break concrete paving layers into pieces with no dimension greater than 750 mm.
- .2 Curb and gutter which is to be removed, and which is attached to existing concrete base which is to remain, shall be carefully broken out so as not to damage the concrete base. Reinforcing rods that extend into the concrete base shall be left intact and straightened to service as dowels for widening the existing concrete base.
- .3 Excavate broken materials.

3.3 Cleanup

- .1 All concrete is to be disposed of at the end of each working day.
- .2 All material removed shall become the property of the Contractor, unless otherwise indicated by the Town. Removal, haul and salvage/disposal of the excavated materials shall be considered as incidental to the work.

- END OF SECTION 32 04 00 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the provision of sanitary sewer CCTV inspections and reporting.

1.2 Related Work

- .1 Section 33 301 00 – Sanitary Utility Sewerage Piping.
- .2 Section 33 05 13 - Manholes and Structures.

2.0 PRODUCTS

2.1 Equipment

- .1 Provide CCTV inspection equipment including a self-contained camera and monitoring unit connected by coaxial cable.
- .2 Provide a waterproof camera assembly with remotely controlled self-contained lighting system and capable of lighting the entire pipe, acceptable to the Engineer.
- .3 Produce a continuous 500 line resolution quality picture showing the entire periphery of the pipe, acceptable to the Engineer.
- .4 Measure defects with devices having a proven accuracy of +1%.
- .5 When cable marking is used, keep spacing 500 mm or less along the length of the cable.
- .6 Establish direct voice communication between the monitoring station and the camera towing device by either a direct line of communication or radio.
- .7 Mount CCTV inspection equipment in an appropriate type vehicle complete with a self contained electrical power supply for the system.
- .8 Connection to external public or private power sources is not allowed.
- .9 Apply sound dampening to the vehicles, cleaning and inspection equipment.

2.2 Inspection Reports

- .1 Maintain a television work report, in log form, during inspection.
- .2 On this log show the exact location of each leak or fault discovered by the inspection, such as open joints, broken, cracked, deformed or collapsed pipe, presence of grease, roots, debris, accumulation, obstructions, infiltration, water depth variation and other points of significance.
- .3 Include the distance of the reference location from the reference manhole and the position of the leak or defect as referenced to the crown of the pipe using clock face notation.
- .4 Indicate the type of cracks on the pipe: circumferential or longitudinal.
- .5 Describe the degree of severity of each leak or defect.
- .6 Take photographs of all sewer defects.

- a) Coordinate photographs with the written report by reference number.
 - b) Take at least one photograph per each sewer section to show representative view of the workmanship, as well as one additional photograph for each deficiency.
- .7 Show each manhole to manhole section of pipe on the report.
- a) On each log sheet, identify the street names, manhole numbers, type of pipe, joint length, direction of flow, pipe diameter, manhole depth, inspection date, name of the inspection technician, persons observing the inspection and video identification numbers.
- .8 Show the visual inspection results of each manhole on the inspected sewer.
- a) Indicate structural conditions of each manhole including the condition of each cover, frame, barrel, benching, flow channel and steps.
- .9 One week after the completion of sewer inspection submit the following to the Engineer:
- a) A digital copy of the final written report, corresponding photographs and one copy of videos on a memory stick or on a file transfer website.
- .10 Include in this report minimum one photograph per manhole to manhole section and additional photographs as required to show line defects and representative line conditions.
- .11 Record sewer inspection digitally. Number all videos and cross index to the written report:
- a) All video numbers.
 - b) Tape distance to location of defects.
 - c) Description of defects shown on the video.
- .12 If, during sewer inspection the television camera will not pass through the entire section between manholes, reset the equipment so that the inspection can be performed from the opposite manhole.

3.0 EXECUTION

3.1 TIMING

- .1 Inspect sewer main upon completion of construction, and at the end of the 1-year warranty period.

3.2 CLEANING

- .1 Flush sewer main as required to permit installation of string line or rope lines.
- .2 Prior to inspection, clean all lines sufficiently to remove dirt, grease, sand, and other debris from inside the pipe and manhole so that cracks and other defects may be observed.

3.3 THREADING OF SEWERS

- .1 Install a small diameter poly rope or similar line in the sewer in advance of the inspection so that the camera traction cable may be drawn through the sewer.
- .2 Tie this line off at each adjacent manhole to facilitate the quick removal of any portion of this line in case of blockages in the main sewer or in case of other emergencies.

3.4 TRAFFIC CONTROL

- .1 Keep interference to the normal flow of traffic to a minimum.
- .2 Arrange the equipment so that one lane of traffic is always maintained.

3.5 FLOW CONTROL

- .1 By-Passing or Pumping
 - a) Divert all sewage flow using pumps or siphons as may be necessary to perform the specified inspection.
 - b) Transport excess sewage flows through a closed pipeline or by Tank Trucks to the nearest downstream manhole or most economical approved disposal site.
- .2 Work during Non-Peak Hours
 - a) When peak flow periods are anticipated during normal working hours, the option to convert to night shift for sewer inspection may be exercised if approved by the Engineer.
 - b) Restrict noise level between 10 pm and 7 am.

3.6 RATE OF PROGRESS

- .1 Do not exceed 6 m per minute of camera time or rate of speed to allow adequate time for operator interpretation.
- .2 Conduct the sewer inspection at a uniform rate of speed.

3.7 INSPECTION FLOW

- .1 Provide a 0.5 L/s flow of clear water for 10 minutes prior to camera inspection of any given section.
- .2 Continue 0.5 L/s flow of clear water through section for entire time camera is in the given section.

1.0 GENERAL

1.1 Not Used.

2.0 PRODUCTS

2.1 Valve Box Extensions

- .1 Valve box extensions shall be 150 mm cast iron and are to be completely coated with an asphaltic type varnish to prevent corrosion.

2.2 Manhole Grade Rings and Blocks

- .1 Precast grade rings and blocks for manhole grade adjustment shall conform to ASTM C478 and C139 respectively.

2.3 Mortar

- .1 Mortar shall be Sulphate Resistant ASTM Type-HS.

3.0 EXECUTION

3.1 Valve Boxes

- .1 The Contractor shall shorten or lengthen the boxes and stems as required and block the boxes to prevent any settlement. The adjustments shall be so made that the valves operate effectively.

3.2 Manhole and Catch Basins

- .1 Manhole and catch basin covers shall be adjusted so that the cover conforms to the required elevation. All adjustments are to be made with mortar and brick or grade rings firmly set in position and grouted. All adjustments are to be watertight.

3.3 Backfill

- .1 Should any backfill be required around the valve box, manhole or catch basin cover below the elevation of the road base course surface, Class I backfill shall be used and compacted in place to 100% SPD.

- END OF SECTION 33 05 13.01 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for manholes and other structures for sewers.

1.2 Standards

- .1 Materials supplied in this section shall be in accordance with ASTM, CSA, and CGSB Standards.
- .2 Precast manhole sections, catch basins, adjusting neck rings, and manhole steps shall conform to CAN/CSA-A257.4.
- .3 Manhole joints shall meet the requirements of CAN/CSA-257.3.
- .4 All precast concrete items shall be marked with manufacturer's identification, date of casting, type of cement, and CSA standard.

1.3 Shop Drawings

- .1 Submit shop drawings for all manholes and other structures for sewers.
- .2 Submit shop drawings for all precast manhole components. Include certification by an independent testing laboratory that cement and aggregate conform to the specified standards.

1.4 Quality Assurance

- .1 Refer to Section 01 45 00 - Quality Control.
- .2 Submit to the Town a list of sources of materials including gravel, borrow materials, and concrete aggregates.
- .3 Provide samples, test results, sieve analyses and reports for preliminary approval of materials.
- .4 Preliminary approval of materials does not constitute general acceptance. Acceptance depends on satisfactory field test results and performance in place.

1.5 Quality Control Testing

- .1 Manhole Backfill
 - a) Moisture density curves to ASTM-D698.
 - b) Sieve analyses to ASTM-C136.
 - c) Field densities to ASTM-D2167 or to ASTM-D2922.
 - d) Provide moisture/density curves for each type of material from each source of material to be compacted to a specified density.
 - e) Conduct a minimum of one of each test for each manhole.
- .2 The manufacturer of the precast concrete items shall perform quality testing and control in accordance with CAN/CSA-A257.0.

- .3 The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the Contract regardless of the minimum number required.

1.6 Disposal

- .1 All materials on site whether stockpiled, stored, or excavated are the property of the Town, and the Town reserves the right to keep any part or all of the material.
- .2 The Contractor shall dispose of all waste materials at sites to be located by the Contractor and approved by the Town.
- .3 Refer to Section 01 52 00 – Construction Facilities for further requirements.

2.0 PRODUCTS

2.1 Concrete

- .1 Concrete shall be made with Type 50 sulphate resistant Portland cement to CAN/CSA-A3000.
- .2 Maximum slump 75 mm, Class 25 MPa.
- .3 In freezing weather, provide concrete with a temperature of not less than 10°C, and maintain this temperature for 72 hours.

2.2 Mortar

- .1 Mortar shall conform to the following mix:
 - a) 1 part Type 50 sulphate resistant cement;
 - b) 1 part clean, sharp sand; and
 - c) Water to provide workability
- .2 In freezing weather, heat sand and cement and apply mortar warm. Protect joints from freezing until mortar has set.

2.3 Crushed Gravel

- .1 Crushed gravel to be in accordance with Section 34 02 00 – Aggregate, granular base material.

2.4 Safety Steps

- .1 Fabricate from 20 mm diameter Type 304 L stainless steel with minimum load resistance of 300 kg.
- .2 Steps shall be cast into precast sections with a maximum spacing of 400 mm.
- .3 The distance from the top of the manhole cover to the top rung shall be a maximum of 450 mm.
- .4 Bottom step shall be spaced to more than 300 mm above the benching.
- .5 For manholes exceeding 7 m in depth, a safety platform shall be installed as required by Occupational Health and Safety regulations.

2.5 Waterproofing/Damp-Proofing

- .1 Exterior damp-proofing - cement mortar coating - 15 mm thickness.

2.6 Manhole Bases - Tee Riser Type

- .1 Precast tee riser sections may be used for manholes where pipes pass straight through manholes. Refer to the Drawings for tee riser manholes locations and dimensions.
- .2 Tee risers to ASTM-C478M, equivalent in strength to the highest class or highest D-load pipe to which it is connected.
- .3 Use Type 50 sulphate resistant cement.
- .4 Concentric reinforcing.
- .5 Rubber gasket joints to ASTM-C443.
- .6 Submit shop drawings.

2.7 Manhole Bases - Standard Type

- .1 Standard 1,200 mm diameter precast manhole to ASTM C478 and shall be used where indicated on the Drawings.
- .2 Manholes to ASTM-C478M, equivalent in strength to the highest class or highest D-load pipe to which it is connected.
- .3 Use Type 50 sulphate resistant cement.
- .4 Concentric reinforcing.
- .5 Rubber gasket joints to ASTM-C443.
- .6 Submit shop drawings.

2.8 Manhole Barrels and Tops

- .1 Circular precast barrel sections to ASTM-C478M with rubber gasket joints to ASTM-C443.
- .2 Precast conical top sections to withstand AASHTO - H20 loading, as detailed on the Drawings. Top sections shall be eccentric or concentric as indicated on the Drawings.
- .3 Frames and Covers
 - a) Manhole frames and covers shall be made of iron and shall conform to ASTM-A48.
 - b) Frames and covers for manholes on roads shall be Norwood NF-80 floating type, as manufactured by Norwood Foundry Ltd., or approved equal.
 - c) Frames and covers for manholes not on roads shall be Norwood NF-39, as manufactured by Norwood Foundry Ltd., or approved equal.
 - d) Submit shop drawings.

- e) Use sealing compound between precast concrete and cast-in-place concrete and between grade rings. Bitumous joint sealing compound to conform to CGSB 56-GP-4A, or approved equal.
- f) Frames and covers shall be hot dipped galvanized according to CSA G164-M.

2.9 Drop Structures

- .1 For pipes and fittings in drop structures, use materials in accordance with pipe size and type entering the drop structure.
- .2 Use all other materials as detailed on the Drawings.
- .3 All pipe entrances through the manhole wall shall utilize a waterstop conforming to ASTM C-923.
- .4 Interior Drop Structures
 - a) Use 25 mm wide x 2 mm thick Type 304 L stainless steel straps.
 - b) Provide polyvinyl chloride (PVC) tee fitting and vent pipe attached to the top end of the pipe as shown on the Drawings.

2.10 Non-Shrink Grout

- .1 Pre-mixed compound consisting of non-ferrous aggregate, cement, water reducing and plasticizing agents, capable of developing a minimum compressive strength of 16.5 MPa at 2 days and 48 MPa at 28 days.
- .2 Master Builders Embeco or approved equal.

2.11 Miscellaneous Metals

- .1 All miscellaneous metal used inside sewer manholes or buried as part of sewer manholes shall be Type 304 L stainless steel.
- .2 All inserts and insert bolts shall be stainless steel.

3.0 EXECUTION

3.1 General

- .1 Excavation for manholes shall be in accordance with Section 31 23 33 – Trenching and Backfilling.
- .2 Keep excavations dry while work is in progress. Protect excavations against flooding and damage from surface runoff and/or groundwater.
- .3 The expense of removing water from trenches, regardless of origin, is the responsibility of the Contractor.
- .4 Over-excavate the base if the material at the bottom of the trench is unsuitable for support and replace with crushed gravel compacted in 150 mm lifts to 97% Standard Proctor Density.

- .5 Where a granular base is specified or directed, provide minimum 150 mm of crushed gravel compacted to 98% Standard Proctor Density.

3.2 Manhole Construction

- .1 Manholes shall be constructed in accordance with details on the Drawings.
- .2 Bases shall be placed on solid, unfrozen ground.
- .3 Construct manhole unit plumb and true to alignment and grade.
- .4 Complete manhole construction as pipelaying progresses.
- .5 Install rubber gasket or flexible sealing compound and set manhole sections in place in accordance with the directions of the manufacturer.
- .6 Cover all interior and exterior joints with mortar.
- .7 Waterproof or damp-proof the exterior if ordered by the Town.
- .8 Build pipes and stubs into manholes and form smooth flow channels or use pre-benched manhole base sections.
- .9 Where drop structures are required, assemble drop structures according to details on the Drawings.
- .10 Plug all lifting holes with non-shrink grout.

3.3 Manhole Benching

- .1 Benching of flow channels shall be in accordance with details on the Drawings.
- .2 Use formwork to install channels and benching and finish the flow channel using a steel trowel.
- .3 Benching shall provide smooth inverts on regular curves through the manhole.
- .4 Factory finished pre-benched manhole base sections may be used for manhole construction.

3.4 Manhole Completion

- .1 Compact backfill around manholes using mechanical tampers, the full depth of the manhole. Compaction shall be to 98% of the maximum density as determined by the Standard Proctor Compaction Test. Class I backfill or fillcrete, as specified in Section 31 23 33 – Trenching and Backfilling, is required around manholes regardless of the class of backfill for the pipe.
- .2 Unless otherwise specified, set the conical tops such that the vertical side is on the right-hand side of the manhole, when looking upstream. Ensure manhole rungs are aligned.
- .3 Place frame and cover on top section to elevation indicated, and adjust tops flush finished grades. If adjustment is required, use concrete grade rings, placed with non-shrink cement mortar. Parge, make smooth and watertight, inside and out.

3.5 Catch Basins

- .1 Catch basins shall be constructed in accordance with details on the Drawings.

- .2 Bases shall be placed on solid, unfrozen ground.
- .3 Construct catch basin unit plumb and true to alignment and grade.
- .4 Install rubber gasket or flexible sealing compound and set catch basin sections in place in accordance with the directions of the manufacturer.
- .5 Plug all lifting holes with non-shrink grout.
- .6 Catch basin frame and cover shall be as specified on the Drawings.
- .7 Frames and covers shall be hot dipped galvanized according to CSA G164-M.

3.6 Connecting Pipe to Manholes and Catch Basins

- .1 Smooth-walled pipes shall be connected to the precast, pre-benched manhole or catch basin with an integral gasket for each connection.
- .2 Non-shrink grout shall be applied around the circumference of the pipe on each side of the manhole or catch basin wall.

3.7 Installing Manholes in Existing Systems

- .1 Where a new manhole is to be installed in an existing run of sewer pipeline, ensure full support of existing pipe during manhole installation.
- .2 Carefully break out the portion of the existing pipe within area of the location of the new manhole and remove all waste debris.
- .3 Make joints watertight between the new manhole and the existing pipe.
- .4 Maintain existing sewage flows during construction.
- .5 Bypass pumping to be provided by Contractor for all sanitary and storm pipe replacements.

3.8 Cleanup

- .1 Remove dirt, mortar, debris and other material from manholes.
- .2 Clean manhole rungs.
- .3 Place covers after cleaning.
- .4 Dispose of all waste material in accordance with Article 1.6 – Disposal.

- END OF SECTION 33 05 13 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for providing gravity sanitary sewer piping and associated appurtenances including, but not limited to, the following:
 - a) Pipe;
 - b) Fittings;
 - c) Jointing materials; and
 - d) Testing.

1.2 Standards

- .1 The Standards and Guidelines for Municipal Water Supply, Wastewater and Storm Drainage Facilities, issued by Standards and Approvals Division, Alberta Environment shall apply to the work of this section.
- .2 Materials supplied in this section are in accordance with ASTM and CSA standards.
- .3 Concrete sewer pipe shall conform to the requirements of CAN/CSA-A257.0, A257.1, A257.2, and A257.3.
- .4 PVC sewer pipe shall conform to the requirements of CAN/CSA-B182.2.

1.3 Quality Assurance

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Testing laboratories or agencies to test materials shall be independent testing agencies approved by the Town.
- .3 The Town may at any time require the Contractor to provide evidence of certification by the testing agency that the materials meet the specified standards.
- .4 Prior to commencing pipelaying activities at the site, the Contractor shall have two pieces of each size and type of sewer pipe tested to verify compliance with the specifications. A copy of the test report shall be provided to the Town.
- .5 All concrete sewer pipe with rubber gasket or confined O-ring joints shall be vacuum tested at the manufacturing plant. The manufacturer shall apply a vacuum of 300 mm of mercury, allow the vacuum to stabilize, and hold the vacuum for 20 seconds with no more than 2.5% vacuum loss. Pipe failing to pass this test shall be rejected. Pipe passing this test shall be marked “air tested”.
- .6 All concrete sewer pipe shall be marked with the manufacturer’s name, date of casting, and vacuum test passing stamp.
- .7 All PVC pipe shall be tested by the manufacturer and marked in accordance with CAN/CSA-B182.2.

- .8 An external load crushing strength test shall be conducted on one piece of each size and type of concrete sewer pipe for each 500 m of pipe to be installed. Tested shall be in accordance with ASTM-C497 – Method 4 External Load Crushing Strength by the 3-Edge Bearing Method.
- .9 Submit to the Town a list of sources of materials including gravel and borrow materials.
- .10 Provide samples, moisture density curves, sieve analyses and reports for each type of material from each source of material to be compacted to a specified density for preliminary approval of materials.
- .11 Preliminary approval of materials does not constitute general acceptance. Acceptance depends on satisfactory field test results and performance in place.

1.4 Quality Control Testing

- .1 Moisture density curves: to ASTM-D698.
- .2 Sieve analyses: to ASTM-C136.
- .3 Field densities: to ASTM-D2167 or to ASTM-D2922.
- .4 Minimum quality control test frequencies specified as follows are the minimum number required. The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the Contract regardless of the minimum number required.
 - a) Field densities:
 - i) Pipe Bedding - one for each 25 m of pipe installed.
 - ii) Pipe Zone Backfill - one for each 25 m of pipe installed.
 - b) If any density test results in less than the required compaction, two more tests shall be taken for the depth and length of backfill or bedding represented by the failed test. If the average of the three tests results in a density less than required, the depth and length of backfill or bedding represented by the failed tests shall be reworked, the soil moisture modified as necessary, re-compacted, and re-tested until the required compaction is met.

1.5 Related Work

- .1 Section 31 23 33 – Trenching and Backfilling.
- .2 Section 33 05 13 – Manholes and Structures.

2.0 PRODUCTS

2.1 Concrete Pipe and Fittings

- .1 Non-Reinforced Circular Concrete Pipe and Fittings
 - a) To meet CAN/CSA-A257.1, Class 3, designed for flexible rubber gasket joints to CAN/CSA-257.3, and constructed with Type 50 sulphate resistant Portland cement to CAN/CSA-A3000.

- b) All fittings shall meet or exceed the specifications of the pipe to which each fitting is to be joined.
- .2 Reinforced Circular Concrete Pipe and Fittings
- a) To meet CAN/CSA-257.2, concentric reinforcing, designed for flexible rubber gasket joints to CAN/CSA-257.3, and constructed with Type 50 sulphate resistant Portland cement to CAN/CSA-A3000.
 - b) D-load to be as specified on the Drawings.
- .3 Liner
- a) Use only where specified on the Drawings, concrete pipes shall be lined with a suitable liner, non-susceptible to surface damage from H₂S.
 - b) Liner shall be PVC or HDPE and shall be cast into the interior pipe wall.
 - c) Liner shall be free of cracks, cleavages, or other defects adversely affecting the protective characteristics of the material.
 - d) The lining shall be repairable at any time during the life of the pipe or the structure.
 - e) In accordance with ASTM-D412, the minimum tensile strength across welded joints shall be 14 MPa.
 - f) T-Lock, as manufactured by Ameron Protective Lining Products, or approved equal.
 - g) The following alternate pipe materials, non-susceptible to surface damage from H₂S, may be used in lieu of lined concrete pipe:
 - i) Polymer Concrete Pipe – to ASTM-D3262, as manufactured by MI Pipes Inc., Meyer Polycrete®, or approved equal.
 - ii) Glass Fiber Reinforced Plastic (GRP) Pipe – to ASTM-D3262, as manufactured by HOBAS Pipe, or approved equal.

2.2 Polyvinyl Chloride (PVC) Pipe and Fittings

- .1 To meet CAN/CSA-B182.2, ASTM D3034 with locked-in elastomeric ring gasket and integral bell system joint type.
- .2 Minimum wall thickness shall be as required for SDR35, unless otherwise authorized by the Town.
- .3 Pipe shall be installed within two years from the production date indicated on the certification.
- .4 Joint lubricants shall be compatible with gasket material.
- .5 Service Connections: Plastic pipe: to CSA B182.1 and ASTM D3034 Type PVC SDR35 with push-on joints.

2.3 Insulation

- .1 Use only where indicated on the Drawings or directed by the Town.

- .2 Use DOW HI-40 Styrofoam board rigid insulation as further detailed on the Drawings, where applicable.

2.4 Non-Shrink Grout

- .1 Pre-mixed compound consisting of non-ferrous aggregate, cement, water reducing and plasticizing agents, capable of developing a minimum compressive strength of 16.5 MPa at 2 days and 48 MPa at 28 days.
- .2 Master Builders Embeco, or approved equal.

2.5 Pipe Bedding

- .1 Concrete
 - a) Concrete shall be made with Type 50 sulphate resistant Portland cement to CAN/CSA-A3000.
 - b) Maximum slump 75 mm, Class 25 MPa.
 - c) In freezing weather, provide concrete with a temperature of not less than 10°C, and maintain this temperature for 72 hours.
- .2 Sand, refer to Section 34 02 00 – Aggregate.

2.6 Backfill in the Pipe Zone

- .1 Sand complying with the gradation specified in Section 34 02 00 – Aggregate.
- .2 Selected native soil shall be material selected from the excavated trench materials by the Contractor. Selected native soil shall be well graded and shall not contain particles larger than 25 mm. It shall be free of frozen material, shall not be saturated, and shall be free of excessive organic material.

3.0 EXECUTION

3.1 Product Delivery, Storage and Handling

- .1 Store and handle pipe in accordance with the manufacturer's recommendations.
- .2 Deliver, store, and handle pipe with care to prevent damage.
- .3 Store materials so that they are kept clean. Clean pipes before installation.
- .4 Where necessary, protect pipe from exposure to sunlight or from any condition that may harm or adversely affect the pipe.
- .5 Inspect for defects upon delivery and immediately before installation.
- .6 Do not install any pipe earlier than 7 days after the date of manufacture.

3.2 Alignment and Grade

- .1 Lay pipe to the required alignment and grade as shown the Drawings, or otherwise directed by the Town.

- .2 Provide minimum 3.00 m depth of cover on the pipe unless otherwise indicated on the Drawings or directed by the Town. Where depth of cover is less than 3.00 m, provide insulation.
- .3 Erect batterboards or sight rails over the trench at intervals of not more than 15 m to provide control, or provide control by laser beam in a manner approved by the Town.
- .4 Acceptable tolerances are as follows:
 - a) Alignment – the centreline of the pipe shall not be more than 100 mm off the specified alignment.
 - b) Elevation – the pipe invert shall not be more than 6 mm plus 0.01 mm per mm diameter of the pipe off the specified elevation.
 - c) Joints – for concrete pipe, deflections at joints shall not exceed that specified by CAN/CSA-A257. For PVC pipe, deflections at joints shall not exceed those recommended by the manufacturer.
- .5 All pipe shall be laid sloping in the desired direction with no reversed grades on any pipe lengths.
- .6 Maintain, and provide to the Town upon request, grade sheets for the installation of the pipe.
- .7 No deviation shall be made from the required alignment or grade without the written consent of the Town.

3.3 Liner Installation

- .1 Where a pipe liner is specified, install the liner in accordance with the manufacturer's instructions.
- .2 The Contractor shall take all necessary measures to prevent damage to installed liners.
- .3 No pipe with damaged lining will be accepted until the damage has been repaired to the satisfaction of the Town.
- .4 Make field joints in accordance with the manufacturer's instructions.

3.4 Pipe Bedding and Pipe Zone Backfill

- .1 Prepare the pipe bedding and pipe zone backfill in accordance with the Drawings and the following:
 - a) Class A:
 - i) Place a cradle of concrete bedding under the pipe and the full width of the trench to the depth shown on the Drawings.
 - ii) Place sand above the concrete and compact to 95% of Standard Proctor Density to 300 mm above the top of the pipe.
 - b) Class B:

- i) Place sand bedding under the pipe and the full width of the trench to the depth shown on the Drawings and compact to 95% of Standard Proctor Density.
 - ii) Place selected native soil or sand above the bedding and compact to 95% of Standard Proctor Density to 300 mm above the top of the pipe.
 - c) Class C:
 - i) Use only if directed by the Town.
 - ii) Place and compact sand bedding under the pipe, across the full width of the trench, and up the sides of the pipe to provide a support angle of 120°. Compact bedding to 95% of Standard Proctor Density.
 - iii) Place selected native soil or sand above the bedding and compact to 95% of Standard Proctor Density to 150 mm above the top of the pipe.
- .2 Provide bell or coupling holes and support the pipe uniformly and continuously throughout its length.
- .3 Granular bedding and backfill shall be placed and compacted in uniform lifts not exceeding 150 mm in depth.
- .4 Where no specific bedding and pipe zone backfill class is indicated on the Drawings, use Class B.

3.5 Pipe Installation

- .1 General
 - a) Follow manufacturer's instructions for pipe installation. Installation of PVC pipe and fittings shall be in accordance with CAN/CSA-182.11. Where manufacturer's instructions and these specifications are in conflict, notify the Town who will provide judgement on which method will govern the Work.
 - b) Handle pipe with implements, tools, and equipment satisfactory to the Town. Use care to prevent damage to pipe and materials. Do not drop pipe or materials into the trench. Do not use chains or cables passed through the pipe bore causing the weight of the pipe to bear upon pipe ends.
 - c) Do not allow contents of existing sewers or sewer connections to flow into the trench.
 - d) Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
 - e) Do not use heavy vibratory equipment for compaction of backfill until at least 1 m of backfill has been placed over the pipe.
- .2 Laying Pipe

- a) Lay pipes on prepared bedding with excavated joint holes that allow the joint ends to be kept clean of soil and bedding material, to facilitate completing the joint and to avoid load concentration on the bells or couplings.
- b) Lay pipe with the bells upgrade, and proceed upgrade.
- c) Produce a smooth, uniform invert.
- d) When pipelaying is not in progress, install a removable, watertight bulkhead at the open end of the last pipe laid to prevent entry of foreign material or varmints.
- e) Plug lifting holes with non-shrink grout.
- f) Cut pipes where necessary to install fittings. Make cuts in accordance with the manufacturer's recommendations using recommended cutting tools. Cut pipes squarely and accurately.
- g) Use gasketed connections to manholes. The Town may authorize the use of non-shrink grout for manhole connections where suitable gasketed connections are not available.
- h) For connections to existing sewer pipes, submit a field-jointing plan to the Town for approval prior to commencing the field joint.

.3 Joining Pipe

- a) Clean and check the sealing surfaces to ensure that they are smooth, concentric, and free from imperfections that might affect the sealing performance of the gasket.
- b) Insert the gasket in accordance with manufacturer's instruction. Take care to ensure the gasket is in the correct position and seated evenly around the pipe.
- c) Lubricate sliding surfaces and couple the pipes immediately.
- d) Carefully align the pipes before jointing.
- e) Minimize lateral pressure on the gasket and maintain concentricity until the pipes are coupled.
- f) Use only approved equipment to pull pipes together to complete jointing.
- g) Avoid displacing the gasket or contaminating the gasket with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned, lubricated, and replaced before jointing is attempted.
- h) Complete each joint before laying the next length of pipe.
- i) Minimize joint deflection after the joint has been made to avoid damaging joints.
- j) When pipelaying is complete, the sewer must be thoroughly cleaned of all dirt, stones, rubbish, and debris but a method approved by the Town.

3.6 SERVICE CONNECTIONS

- .1 Install pipe to CSA B182.11 and manufacturer's standard instructions and specifications.
- .2 Install 100 mm diameter sanitary services to vacant or unserved properties as per drawings or obtain direction from Engineer.
- .3 Minimum 2% grade for sewer services.
- .4 Use approved couplings, adaptors or clamps to connect existing sewer service pipes to new service connections. Prior to connecting the existing service to the new service, the existing service pipe should be examined to ensure that no damage exists. If damage within the existing service is noted, proceed based on direction from Engineer.
- .5 Service connections to main sewer: saddle connections.
- .6 Service connection pipe: not to extend into interior of main sewer.

Make up required horizontal and vertical bends from 45° bends or less, separated by straight section of pipe with minimum length of four pipe diameters. Use long sweep bends where applicable.

3.7 Floating Pipe

- .1 As the work progresses, place adequate backfill to prevent floating of pipes.
- .2 Remove and re-lay any pipes which have floated.

3.8 Connecting to Existing Mains

- .1 Notify the Town in writing at least five (5) days prior to connecting to an existing sewer main. Include a work plan identifying necessary flow control and a contingency plan detailing the procedures to be observed in the event of problems during the connection process or other emergency. Written approval must be received from the Town at least 24 hours before connecting to existing mains.
- .2 Any disruption of service must conform to Article 3.11 – Temporary Sewer Service of this section and Article 4.17 of Section 00 72 00 – General Conditions.

3.9 Plugging of Dead Ends

- .1 Insert standard plugs into the bell ends of fittings or pipe bells. Place plugs over spigot ends of fittings and pipes.

3.10 Insulation

- .1 Install insulation in accordance with the manufacturer's instructions and the Drawings.

3.11 Manhole Break-Ins

- .1 Break-in holes shall not exceed a reasonable size to permit the smooth movement of the new pipe into the manhole.

- .2 Break-in holes shall be made by coring through the manhole wall or by carefully chiseling the hole. Blunt tools, including sledgehammers, shall not be used to put holes in manholes.
- .3 All due care shall be taken to avoid damage to surrounding areas of the manhole. Any areas of the manhole that have been damaged during the break-in shall be repaired by the Contractor to the satisfaction of the Town.
- .4 Following installation of the new pipe, the break-in area shall be suitably repaired and grouted, providing a watertight seal around the pipe.
- .5 The flow channel in the manhole shall be modified to provide a smooth continuation of flow from the break-in pipe through the manhole.

3.12 Temporary Sewer Service

- .1 Where performance of the Work requires disruption of water services, the Contractor must provide at least five (5) days notice to all affected parties. Such notice shall consist of an information pamphlet, subject to the review and approval of the Town, which shall be hand-delivered to affected parties.
- .2 The Contractor shall provide temporary facilities as required to provide sewer service for commercial building, apartment buildings, and multi-family developments affected by disruption of service longer than 8 hours in the performance of the Work.
- .3 The Contractor shall provide residents of single-family houses or duplexes, affected by disruption of service longer than 8 hours in the performance of the Work, with suitable temporary sewer facilities.
- .4 Temporary sewer facilities shall be subject to the approval of the Town.

3.13 Bypass Pumping

- .1 Schedule work to minimize interruptions to existing services.
- .2 Maintain existing sewage flows during construction.
- .3 Bypass pumping to be provided by Contractor for all sanitary pipe replacements.
- .4 Submit schedule of expected interruptions for approval and adhere to approved schedule.

3.14 Inspection and Testing

- .1 The Contractor shall provide all materials, equipment, and labour necessary to inspect and test sewer pipes.
- .2 Any sewer mains that fail to pass inspection and testing, or having obstructions, breaks, or any other defects, shall be repaired, re-inspected, and re-tested to the satisfaction of the Town, at the Contractor's sole expense.
- .3 CCTV Inspection
 - a) The Contractor shall arrange for television inspection of the sewer. Television inspection shall be done in accordance with Section 33 01 30.16 – CCTV Inspection.

.4 Testing

- a) Following successful inspection and cleaning, leakage tests shall be performed by the Contractor, upon the direction of the Town. The Town will determine if the test shall be an infiltration or exfiltration test.
- b) The Contractor shall provide all water, materials, equipment, and labour required for the testing. Equipment shall include plugs, meters, and other measuring equipment that is acceptable to the Town, to measure exfiltration or infiltration.
- c) The Town will direct which sections of the main shall be tested.
- d) Infiltration testing shall be performed by plugging the upstream end of the test section and measuring flow at the downstream end.
- e) Exfiltration testing shall be performed by plugging both ends of the test section and filling the test section to provide a hydrostatic head of 600 mm above the top of the highest point in the test section.
- f) The test duration shall be 4 hours.
- g) The allowable leakage shall be as follows:

Type of Pipe	Allowable Leakage
Concrete Pipe	60 L/mm dia./km/day
PVC Pipe	5 L/mm dia./km/day

- h) No additional leakage allowance will be made for manholes.

3.15 Cleanup

- .1 Cleanup and restore the affected areas to a condition at least equal to that existing prior to installation, and in accordance with other applicable requirements of the Contract Documents.

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for work verifying the stability of subgrade compaction. This procedure shall be performed in the presence of the Town. Actual requirements for representation on the project site for the proof rolling operation will be site dependent.

1.2 Related Sections

- .1 Section 31 23 00 – Excavation and Fill
- .2 Section 34 01 00 Subgrade Preparation

2.0 EXECUTION

2.1 Equipment

1. Single axle, dual wheel truck.
2. Tire pressure shall be no less than 275 KPa.
3. The truck shall be loaded to a minimum of 9100 kg of the rear axle.

2.2 Procedure

1. The proof rolling vehicle shall be operated at a rate not to exceed 3.0 to 6.0 km/hr. or a comfortable walking pace. Adjust the speed to allow for measurement of any deflection and / or areas of rutting.
2. Operate the proof rolling in a pattern so that all areas are loaded with at least one pass of the proof rolling vehicle.
3. After proof rolling, check the subgrade for conformance, correct all irregularities.

2.3 Evaluation

- .1 There shall not be any discernable rutting during the proof roll. Rutting of not more than 100 mm, shall be considered a failure and require the subgrade to be reworked and compacted.
- .2 Rutting and/or deflection in excess of 100 mm must be reviewed by a Geotechnical Engineer who is to provide recommendations as to how to meet density and performance requirements.
- .3 When remedial work is performed under item 2.3.1 and 2.3.2 a final proof roll must be performed upon completion of the work.

- END OF SECTION 34 01 00 10-

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for working and compacting subgrade soil.

1.2 Definition

- .1 Prepared subgrade: soil immediately below the granular sub-base, base course, pavement structure or concrete slab, pad or curb & gutter, and boulevards, compacted to a depth of 150 mm or 300 mm or as specified.

1.3 Quality Assurance

- .1 Refer to Section 01 45 00 – Quality Control.

1.4 Quality Control

- .1 Maximum Density: the dry unit mass of a sample of soil at an optimum moisture content as determined according to ASTM-D698 method A.
- .2 Required Densities:
 - a) Minimum of 100% of the maximum density for each 150 mm lift of subgrade under pavement structures, concrete; curb & gutter, curb ramps, alley and access crossings
 - b) Minimum of 98% of the maximum density for each 150 mm lift of subgrade under concrete sidewalks, asphalt trails.
 - c) Minimum of 95% of the maximum density for each 150 mm lift of subgrade under turf areas, planting beds and disturbed areas.
- .3 Testing Frequency to ASTM-D2169 or to ASTM-D2922:
 - a) Subgrade – one for each 1,000 m² of compacted lift.
 - b) Fill – one for each 2,000 m² of compacted lift.
- .4 Proof Rolling: a proof roll of the finished subgrade will be required to confirm adequate bearing capacity of the subgrade soil. Proof rolling to be in accordance with Section 34 01 00.10 – Proof Rolling.
- .5 The Contractor shall perform as many tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the minimum number specified.

1.5 Related Sections

- .1 Section 34 01 00.10 – Proof Rolling
- .2 Section 34 02 00 – Aggregate
- .3 Section 34 02 01 – Granular Base
- .4 Section 34 12 16.10 – Hot Mix Asphalt Concrete

2.0 PRODUCTS

2.1 Materials

- .1 Use only compacted clay subgrade soil with no deleterious material approved by the Town.

2.2 Equipment

- .1 Use various pieces of equipment designed for disking, scarifying, spreading, spraying water, compacting and trimming material to specified depth and cross section and proof rolling.

3.0 EXECUTION

3.1 Subgrade Preparation

1. Loosen clay to required depth. Work clay with cultivating and mixing equipment until clay is pulverized into pieces no larger than 25 mm maximum, exclusive of all rock.
2. The required compaction can generally best be achieved if the clay is dried or moistened to within $\pm 3\%$ of the optimum moisture content prior to compacting.
3. If the Town determines that it is not practical to dry the clay, the Town may order cement stabilized soil. Spread clay in lifts not to exceed 150 mm compacted. Compact each lift to the required density in 1.4.2.
4. Leave the surface of the compacted subgrade slightly higher than required elevation; then trim to the required elevation.
5. Leave the finished surface even and free of depressions, humps, loose debris and foreign material.
6. Finished subgrade shall be within 6 mm above the specified elevation or within 25 mm below the specified elevation.

3.2 Tolerances

- .1 Trim high spots and refinish surface to within tolerance.
- .2 Add approved material to low areas, scarify and blend to full subgrade depth recompact to required density and refinish surface at the contractor's expense. Fill low areas with extra thickness of subsequent granular sub-base or base course at the contractor's expense
- .3 If a density test result is less than the required density, the test result is discarded and 3 retests shall be performed on the area represented by the failed test. The average of the 3 tests shall represent the density of that area. If this average is less than the required density, the area shall be reworked to the full depth of the lift, the soil moisture altered as necessary and recompact to the required density. If the area is not retested but is reworked and recompact the area shall be tested at the normal testing frequencies.

- .4 The Contractor shall assume the risk of uncovering and reworking the subgrade if it is covered before the Town has accepted the test result.

3.3 Protection of finished Work

- .1 Do not permit vehicle traffic over prepared subgrade.
- .2 If the subgrade floods, drain immediately by natural flow or by pumping into catch basins, manholes or ditches. This work shall be done at the contractor's expense.
- .3 Maintain protection of the prepared subgrade until subsequent granular sub-base or base course is placed. Repair and retest as required by the Town if damaged.

- END OF SECTION 34 01 00 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the production of Portland cement concrete for curbs, gutters, sidewalks and slab-on medians (islands).
- .2 This section includes, but is not limited to, the specifications for aggregate, mix design, quality control and assurance, delivery, placement, inspection, and finishing.

1.2 Quality Control

- .1 Refer to Section 01 45 00 - Quality Control.
- .2 Submit the proposed concrete mix design to the Town for review at least 10 days in advance of scheduled concrete work at the site. No concrete production may proceed until the submitted mix design has been reviewed and approved by the Town. Submit a revised mix design to the Town for review and approval whenever there is a change in material, source, or proportion. If requested by the Town, the Contractor must provide sufficient evidence that the mix design will produce concrete meeting specified requirements; this shall include, at a minimum, strength tests on trial mixes made under plant conditions.
- .3 Submit the cement manufacturer's mill tests to the Town monthly, or as requested.
- .4 Submit fly ash test reports to the Town monthly, or as requested.
- .5 Submit abrasion and soundness test results for each aggregate source. Submit sieve analysis and crushed face count results for the aggregate stockpile at the time of award.
- .6 Submit a copy of the current plant scale certificates.
- .7 All submittals shall be submitted to the Town for review and approval at least 10 days in advance of concrete production and for each subsequent change in supplier or source of materials.
- .8 Preliminary approval of materials does not constitute general acceptance. Acceptance depends on satisfactory field test results and performance in place.

1.3 Quality Assurance

- .1 In addition to quality control provided by the Contractor and field inspections by the Town, the Contractor will retain the services of an independent testing agency, as approved by the Town, to conduct plant inspections, materials sampling, and testing as follows:
 - a) Weekly asphalt plant inspections during production will be conducted to verify plant calibrations, operation, production settings, and handling procedures. Samples of materials and mixtures will be taken and tested.
 - b) Slump testing, to CAN/CSA-A23.2-1C and CAN/CSA-A23.2-5C, to be taken between the 10% and 90% points of discharge of a concrete load, and conducted with every strength test, or as directed by the Town.

-
- c) Air content testing, to CAN/CSA-A23.2-1C and CAN/CSA-A23.2-4C or CAN/CSA-A23.2-6C, to be taken between the 10% and 90% points of discharge of a concrete load, and conducted with every strength test, or as directed by the Town.
 - d) Air void examination, to ASTM-C457, modified point count traverse method at 100-times magnification, to be performed on one 100 mm diameter core, drilled from hardened concrete, for every 2,000 lin.m. of concrete curb, gutter, or sidewalk poured, or other frequency as directed by the Town. The top of the core shall be ground down to 2 mm ± 0.5 mm below and parallel to the finished concrete surface to produce a surface suitable for microscopic examination.
 - e) Ironstone content testing shall be conducted with every strength test, or as directed by the Town.
 - f) Strength testing, to CAN/CSA-A23.1-9C and CAN/CSA-A23.2-2C, to be taken at a minimum frequency of one test for each 60 m³ of concrete, or fraction thereof, in any one day, or as directed by the Town.
 - g) A minimum of one (1) sieve analysis, to ASTM-C 136, for every 1,000 tonnes of aggregate used in concrete production.
 - h) Conduct a complete petrographic analysis of the fine and coarse aggregate for the proposed mix design and provide results of abrasion loss, MgSO₄ soundness loss, cement-aggregate reactivity, and ironstone content testing.
- .2 All testing shall be performed by a technician certified by CSA or ACI.
 - .3 A copy of all test results shall be submitted to the Town at the end of each production week, or as requested by the Town.

1.4 Related Work

- .1 Section 01 11 00 – Summary of the Work.
- .2 Section 01 22 00 – Measurement and Payment.
- .3 Section 34 01 01.01 – Curbs, Gutters, Walks and Slabs.
- .4 Section 34 01 02 – Formwork for Curbs, Gutters, Walk and Slabs.
- .5 Section 34 01 03 – Reinforcing for Curbs, Gutters, Walk and Slabs.

2.0 PRODUCTS

2.1 Portland Cement

- .1 Portland cement shall conform to CAN/CSA-A3000-A5, Type 10 (Normal).

2.2 Aggregate

- .1 Aggregate shall conform to CAN/CSA-A23.1 Clause 5.
- .2 Coarse aggregate is the total aggregate retained on a 5 mm sieve. Fine aggregate is the total aggregate passing through a 5 mm sieve and retained on a 2.5 mm sieve.

-
- .3 Ironstone content in coarse aggregate shall not exceed 1.0% by mass of the total coarse aggregate sample.
 - .4 Ironstone content in fine aggregate shall not exceed 1.5% by mass of the total, dry, unwashed fine aggregate sample.
 - .5 Where ironstone content testing results are greater than the maximum specified ironstone content, the concrete represented by the failed test shall be removed and replaced by the Contractor, at the Contractor's sole expense.

2.3 Water

- .1 Water shall be clear, free from deleterious material that may inhibit proper mixing and curing of concrete, and in accordance with CAN/CSA-A23.1 Clause 4.

2.4 Air-Entraining Admixtures

- .1 Air-entraining admixtures shall conform to ASTM-C260.

2.5 Chemical Admixtures

- .1 Chemical admixtures, including water-reducing agents, retarders, and accelerators, shall conform to ASTM-C494.
- .2 The use of chemical admixtures shall only be permitted upon written authorization of the Town.

2.6 Fly Ash

- .1 Fly ash shall conform to CAN/CSA-A3000, A23.5, pozzolan Type F for Type C1.
- .2 Up to 10% of the specified minimum cement content may be replaced with fly ash for concrete production between May 16 and September 30.

2.7 Curing Compound

- .1 Curing compound shall conform to ASTM-C309, Type 2, Class B, white pigment, resin based, liquid membrane-forming compound.

2.8 Joint Filler and Sealant

- .1 Prefomed joint filler shall conform to ASTM-D1751.
- .2 Joint sealant shall conform to ASTM-D 1190, hot-poured elastic type.

2.9 Reinforcing

- .1 Refer to Section 34 01 03 – Reinforcing for Curbs, Gutters, Walks and Slabs.

2.10 Mix Design

- .1 The mix design shall conform to the following:
 - a) Slump: 60 ± 20 mm;
 - b) Entrained air limits: greater than 5.5% by volume;
 - c) Maximum aggregate size: 20 mm;
 - d) Maximum water to cementing materials ratio: 0.45 by mass;

-
- e) Minimum cement content:
 - i) 335 kg/m³ between April 15 and May 15 or between October 1 and October 15; or
 - ii) 302 kg/m³ between May 16 and September 30.
 - f) Maximum fly ash content:
 - i) None between April 15 and May 15 or between October 1 and October 15; or
 - ii) 33 kg/m³ between May 16 and September 30.
 - g) Minimum 28-day compressive strength:
 - i) 30 MPa for air content 5.5 to 5.9%;
 - ii) $[42 - (2 \times \text{air content } \%)]$ MPa for air content 6.0 to 7.9%; or
 - iii) 26 MPa for air content greater than 8.0%.
 - .2 If concrete is to be placed by pumping, the specified slump and air content shall be met at the point of pump discharge.
 - .3 Concrete shall not be placed between October 16 and April 1 unless written authorization has been issued by the Town. All concrete authorized to be placed during this period shall attain a minimum compressive strength of 27.0 MPa at 7 days, and shall be provided with cold-weather protection, in accordance with CAN/CSA-A23.1 Clause 23.2.3.4, sufficient to maintain concrete surface temperatures 10 °C or greater for 7 consecutive days following placement. Submit a detailed work plan for all such authorized cold-weather concrete work to the Town for review and approval at least 5 days in advance of such scheduled concrete work at the site.
 - .4 For slipformed concrete, limit slump as follows:
 - a) For curbs and gutters: 20 ± 10 mm; and
 - b) For walks: 30 ± 10 mm.
 - .5 Type 30 (High Early Strength) or Type 50 (Sulphate-Resistant) cement may be substituted for Type 10 cement upon the written approval of the Town. Type 50 cement may only be authorized for use between May 16 and September 30.

3.0 EXECUTION

3.1 Concrete Delivery

- .1 Concrete delivery shall be in accordance with CAN/CSA-A23.1 Clause 18.4.
- .2 Rotating drum trucks, capable of adequately agitating and mixing the concrete during transport, shall be used for concrete delivery.
- .3 Rotate the drum at mixing speed for at least 3 minutes immediately before discharge.
- .4 Retemper the concrete mixture with water at the site when slump at the point of initial discharge is less than that specified, and only upon authorization of the Town. Retempering with water shall be performed as follows:

-
- a) Introduce up to 12 L of water for each 1 m³ of concrete in the mixer to bring the slump into specified limits.
 - b) Rotate the drum mixer a minimum of 30 revolutions at mixing speed until the retempered mixture is uniformly mixed.
 - c) Following retempering, if slump exceeds the specified maximum limit, that load of concrete shall be rejected.
- .5 Retemper the concrete mixture with air-entraining admixtures at the site when entrained air in the concrete at the point of initial discharge is less than that specified, and only upon authorization of the Town. Retempering with air-entraining admixtures shall be performed as follows:
- a) Only Town-approved air-entraining admixtures shall be used.
 - b) A qualified technician shall coordinate the retempering process at the site. The Town may request evidence of any technician's credentials to form such retempering operations.
 - c) The technician shall perform an air content test on each load of concrete retempered with air-entraining admixtures, and shall immediately provide the results to the Town.
 - d) For air content from 4.0 to 5.4, the technician may direct the addition of water or air-entraining admixtures as deemed necessary to meet specifications.
 - e) For air content less than 4.0, no retempering shall be permitted and the load shall be rejected.
 - f) Only one opportunity shall be granted to retemper any one load to meet the required air content. If retempering fails to meet the specifications, the load shall be rejected.
 - g) A load of concrete that has been rejected following a failed attempt at retempering with air-entraining admixtures shall not be retempered at the concrete plant and subsequently returned to the site for use in the Work.
- .6 If the need for retempering with water or air-entraining admixtures becomes consistent, the Town may refuse to accept concrete loads that have been retempered, and may require the contractor to revise the mix design accordingly before concrete production can continue.
- .7 On-site mix adjustments with cementitious materials, sand aggregate, or any chemical admixtures, other than air-entraining admixtures and superplasticizers, is strictly prohibited, unless authorized by the Town in writing.
- .8 The use of air-deintraining admixtures, or any other chemical admixtures, including water-reducing agents, retarders, and accelerators, is strictly prohibited, unless authorized by the Town in writing.
- .9 Where the ambient temperature is greater than 23 °C, the maximum concrete mix temperature shall not exceed 30 °C at the time of placement. If the concrete mix temperature exceeds 30 °C at the time of placement, all such concrete represented by that load shall be rejected.

-
- .10 Where the ambient temperature is less than 5 °C, the concrete mix temperature shall be between 15 °C and 30 °C at the time of placement. If the concrete mix temperature is outside of these specified limits at the time of placement, all such concrete represented by that load shall be rejected.
 - .11 Completely discharge the concrete load within 90 minutes of initial mixing of water, cement, and aggregate at the plant. The discharge time may be extended to up to 120 minutes with the use of hydration control admixtures, where approved by the Town. The supplier must submit sufficient evidence that the plastic concrete properties (slump, air content, and temperature) can be maintained through the extended discharge time period. Such evidence must be submitted for Town review and approval at least 10 days in advance of scheduled concrete work at the site.
 - .12 Provide the Town with a delivery ticket for each concrete load, clearly indicating the following information:
 - a) Concrete supplier
 - b) Concrete plant location
 - c) Ticket number
 - d) Truck number
 - e) Mechanical date and time stamp of initial plant mixing
 - f) Mix design identification
 - g) Cement type
 - h) Aggregate size
 - i) Type and amount of admixtures
 - j) Volume of water added
 - k) Volume of concrete
 - l) Site arrival time
 - m) Start and end of discharge times
 - n) Any other information that may reasonably be requested by the Town.

3.2 Paving

- .1 Place concrete in accordance with CAN/CSA-A23.1.
- .2 Thoroughly clean all reinforcement and formwork.
- .3 Moisten the subgrade or sub-base surface, reinforcement, and formwork with water prior to placing concrete to minimize absorption of water from the concrete following placement.
- .4 Do not place concrete during a rain event, when a rain event is imminent, nor when, in the opinion of the Town, the weather is unsuitable for concrete placement.
- .5 Pour concrete continuously and rapidly between predetermined construction joints.

-
- .6 Refer to Section 34 01 00 - Curbs, Gutters, Walks and Slabs for additional requirements.

3.3 Finishing

- .1 Perform initial and final concrete surface finishing in accordance with CAN/CSA-A23.1.
- .2 The use of water to facilitate finishing operations is strictly prohibited. To aid in concrete finishing, the surface may be fogged with an evaporation reducer acceptable to the Town.
- .3 Protect the work area from rain to avoid excessive moisture on the unfinished surface.
- .4 Finishing shall be performed by, or under the direction of, certified journeyman concrete finishers.

3.4 Protection

- .1 Protect freshly placed concrete from freezing, premature drying, adverse weather conditions, tampering, and physical disturbance in accordance with CAN/CSA-A23.1 Clause 21.
- .2 Concrete shall be protected from freezing for a minimum of 4 days following placement, or for the time necessary to achieve 75% of the specified 28-day compressive strength, whichever is greater.
- .3 The Contractor shall repair any such damaged areas to the satisfaction of the Town, at the Contractor's sole expense.

3.5 Curing

- .1 Membrane Curing
- a) Membrane curing is required when the maximum daily air temperature is not expected to exceed 5 °C for 72 hours following concrete placement.
 - b) Cure exposed concrete surfaces using an approved curing compound applied with a pressurized spray nozzle.
 - c) Apply a continuous and uniform coating of the compound over the surface. Follow compound manufacturer's instructions for the optimal application dose rate.
- .2 Moist Curing
- a) Moist curing shall only be used where directed by the Town.
 - b) After the concrete has set, maintain a moist condition on the concrete surface by using wet burlap or polyethylene film over the surface for a minimum of 7 days.

3.6 Tolerances

- .1 The Contractor shall assist the independent testing agency in obtaining field samples for quality assurance testing.

- .2 The Contractor shall suspend pouring operations after sampling until field quality testing results are known.
- .3 Surface Temperature
- a) For concrete where the surface temperature is found to be less than 0 °C, the concrete may be accepted by the Town subject to a pay factor adjustment in accordance with the following table:

Time Following Placement That Temperature Falls Below 0 °C	Pay Factor (% of Price)
> 96 hours	100.0
72 to 96 hours	80.0
48 to 71 hours	70.0
< 48 hours	Work Rejected

- b) The application of a pay factor or rejection shall apply to the area or extents represented by, or measured by, field testing.
- .4 Slump
- a) Where the measured slump from any load is determined to be deficient from that specified, a second test shall be performed on another portion of the same load. If the second test fails, the load will be rejected and the contractor shall remove any portion of that load that may already have been poured.
- .5 Air Content
- a) For concrete where the air content is found to be less than specified, the Town may authorize retempering of the concrete as defined in Article 3.1.5.
- b) For air content less than 4.0, no retempering shall be permitted and the load will be rejected. The contractor shall remove any portion of that load that may already have been poured.
- .6 Spacing Factor
- a) The maximum allowable spacing factor is 0.23 mm, as determined by Air Void Examination, specified in Article 1.3.1d).
- b) If the spacing factor of a core sample is greater than 0.23 mm, the concrete represented by that sample shall be rejected.
- c) Where concrete has been rejected and is to be removed for failing to meet the spacing factor requirements, the Contractor shall, at its sole expense, commission the independent testing agency to conduct an Air Void Examination of two additional core samples, one from each end of the removal area, to prove that the concrete left in place meets the spacing factor requirements. Should either additional sample fail to meet the specified spacing factor, the area represented by the failed sample shall duly be rejected.
- .7 Strength

- a) If strength test results in a measured strength that is less than that specified, the area represented by the failed test may be accepted by the Town subject to a pay factor adjustment in accordance with the following table:

Cylinder Strength % of Specified Strength	Pay Factor (% of Price)
95- 100	100
90-94	90
85- 89	85
< 85	Work Rejected

- b) The application of a pay factor or rejection shall apply to the area or extents represented by, or measured by, field testing.
- c) The Contractor may, at its sole expense, elect to provide evidence of strength by coring and testing to CAN/CSA-23.2-14C, by a qualified independent testing agency, within 7 days of a failed 28-day cylinder test or within 3 days of a failed 7-day cylinder test. Three cores shall be drilled from the concrete area represented by the failed test at locations approved by the Town. The average strength of the three cores will be used in the subsequent application of Article 3.6.7a).

3.7 Rejected Work

- .1 All rejected products and work shall be adequately removed from the site by the Contractor and corrected to the satisfaction of the Town, at the Contractor's sole expense.

3.8 Cleanup

- .1 Remove and dispose of all debris and excess material at the site at the end of each working day, and in a manner acceptable to the Town.
- .2 Maintain the site and areas adjacent to the site in a condition acceptable to the Town, and in accordance with other applicable requirements of the Contract Documents.

- END OF SECTION 34 01 01 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the supply and installation of cast-in-place concrete curbs, gutters, sidewalks and slabs.

1.2 Quality Control

- .1 Refer to Section 01 45 00 - Quality Control.

1.3 Quality Assurance

- .1 Quality assurance testing is as specified in Section 34 01 01 - Concrete for Curbs, Gutters, Walks and Slabs.

1.4 Related Work

- .1 Section 01 11 00 – Summary of the Work.
- .2 Section 01 22 00 – Measurement and Payment.
- .3 Section 33 01 00 – Excavation and Fill.
- .4 Section 34 01 01 – Concrete for Curbs, Gutters, Walks and Slabs.
- .5 Section 34 01 02 – Formwork for Curbs, Gutters, Walks and Slabs.
- .6 Section 34 01 03 – Reinforcing for Curbs, Gutters, Walks and Slabs.
- .7 Section 37 91 19 – Landscape Grading.

1.5 References

- .1 Contract Drawings and Standard Details

2.0 PRODUCTS

2.1 Concrete

- .1 Refer to Section 34 01 01 - Concrete for Curbs, Gutters, Walks and Slabs.

2.2 Formwork

- .1 Refer to Section 34 01 02 - Formwork for Curbs, Gutters, Walks and Slabs.

2.3 Reinforcing

- .1 Refer to Section 34 01 03 - Reinforcing for Curbs, Gutters, Walks and Slabs.

3.0 EXECUTION

3.1 Types of Construction

- .1 The following types of construction are included in the work of this section. The Contractor may use either hand-forming or slip forming methods for construction. Construct each as specified on the Drawings or directed by the Town.
 - a) Curb
 - b) Gutter
 - c) Separate Sidewalk
 - d) Monolithic Walk
 - e) Curb Ramps or Pararamps (Wheelchair Access Ramps)
 - f) Slab-on Median (Island)

3.2 Landscape Removal

- .1 Limit the amount of landscape removal to that absolutely required to complete the Work, to a maximum width of 125 mm on either side of the pavement structure.
- .2 Complete any landscaping repairs at least 7 days, and no later than 10 days, following placement of concrete at that location.
- .3 The Contractor shall deliver a notice, subject to the review of the Town, to the affected residents apprising them of their watering and maintenance responsibilities with respect to restored landscaping.
- .4 Refer to Section 37 91 19 – Landscape Grading for landscaping restoration requirements.

3.3 Pavement Removal

- .1 Where execution of the Work requires removal of existing asphalt pavement for gutter removal and replacement, backfill the pavement removal area with concrete as specified for gutter construction.
- .2 Backfill as a separate pour at least 24 hours, and no later than 48 hours, following placement of concrete at that gutter location.
- .3 Backfill to 25 mm below grade to allow for an asphalt patch, to be completed by the Town.
- .4 Refer to Section 32 02 00 for pavement removal requirements.

3.4 Preparation

- .1 Prior to concrete placement, inspect the prepared sub grade or granular base for damage or deterioration. Repair any such damage or deterioration.
- .2 Complete subgrade preparation to Section 34 01 00 – Subgrade Preparation.
- .3 Where required, granular base shall consist of 150 mm compacted thickness aggregate in accordance with Section 34 02 01 – Granular Base.

3.5 Formwork

- .1 Place forms in accordance with Section 34 01 02 - Formwork for Curbs, Gutters, Walk and Slabs.
- .2 Hand-form and place concrete at corners curb crossings, and catch basins concurrent with slipforming operations. Where such concurrent work is impractical, complete hand-form areas within 7 days of slipforming adjacent work.

3.6 Concrete Reinforcing

- .1 Construct concrete reinforcing in accordance with Section 34 01 03 - Reinforcing for Curbs, Gutters, Walk and Slabs.

3.7 Paving

- .1 Place concrete in accordance with Section 34 01 01- Concrete for Curbs, Gutters, Walk and Slabs.
- .2 Use pencil vibrators for curb and gutter, and approved vibrating screeds for walks.
- .3 Continuously place concrete for the duration of the scheduled pour. Arrange concrete delivery such that the discharge interval between loads is less than 30 minutes. Install a construction joint where the discharge interval exceeds 30 minutes.
- .4 Curb line walks, curb ramps, and curb crossings shall be poured monolithically. The use of dowels and joint sealant at the back of the curb is strictly prohibited.

3.8 Finishing

- .1 Finish concrete in accordance with Section 34 01 01 – Concrete for Curbs, Gutters, Walk and Slabs.
- .2 Tool all edges to a width of 50 mm and round all edges to a 6 mm radius, unless otherwise specified or directed by the Town.
- .3 Apply a brush final finish longitudinally along curb and gutter. Apply a brush final finish transversely along walks. Broom finish as follows:
 - a) Use a brush with nylon bristles that can form surface grooves no deeper than 3 mm.
 - b) Remove excess water from the brush bristles prior to brushing.
 - c) Brush in a uniform pattern over the entire surface in the specified direction.
- .4 Stamp the Contractor's name and year of construction in the plastic concrete as follows:
 - a) Top of curb in each block or at 200 m intervals, whichever is less; and
 - b) In walks at the end of each block, on an extension of the nearest adjacent property line.

3.9 Crack-Control Joints

- .1 Crack-control joints are intended to control the location of shrinkage cracks in hardening concrete. Construct joints in accordance with the following:
 - a) Formed Joints
 - i) Form the groove by inserting a metal or fibre strip, or polyethylene film into the plastic concrete.
 - ii) Finish the edges to a 6 mm radius.
 - iii) Remove the insert immediately following the initial set of the concrete.
 - iv) Seal the joint with an approved sealant.
 - b) Tooled Joints
 - i) Form the groove by hand using a jointing tool with a thin metal blade to impress plane of weakness into the plastic concrete.
 - ii) Finish the edges to a 6 mm radius.
 - iii) Seal the joint with an approved sealant.
- .2 Joints shall be 3 to 5 mm wide at the following depths:
 - a) Minimum 50 mm deep to a maximum of 25% of the gutter depth for curb and gutter,
 - b) Minimum 25 mm deep to a maximum of 25% of the walk thickness for walks.
- .3 Joint spacing shall be a maximum of 3 m.
- .4 Surface Dummy Joints
 - a) 5 mm wide by 10 mm deep and centered between contraction joints across walks.
 - b) For monolithic construction, place surface joints across the walk portion and contraction joints on the curb and gutter, both joints being on the same side.
 - c) Place a longitudinal joint on walks continuing through crossings where required.

3.10 Isolation Joints

- .1 Isolation joints are required next to immovable structures, where indicated on the Drawings, and where directed by the Town.
- .2 Construct the joint by sawing or forming to create a clean break through full cross-section of the concrete member.
- .3 Make the joint wide enough to allow a snug fit for the pre-formed joint filler.
- .4 Alternatively, place pre-formed joint filler against the structure and pour the concrete against the filler.

3.11 Construction Joints

- .1 Construction joints are required between concrete pours or for joining new concrete to existing concrete.
- .2 Review and confirm the location of all construction joints prior to commencing construction.
- .3 Construct the joint with a keyway, dowels, or tie bars as specified herein, on the Drawings, or as otherwise directed by the Town.
- .4 Vertically trim existing concrete by sawcutting at least 50 mm deep and breaking.
- .5 Transverse Construction Joints
 - a) Use 10M deformed tie bars at 300 mm spacing, extending minimum 300 mm into both sides of the joint.
 - b) At the end of a joint pour, vary joint spacing as follows:
 - i) Where a joint pour ends within 300 mm of a required joint location, equally space the last two joints; and
 - ii) Where a joint pour ends within 800 mm of a required joint location, equally space the last three joints.
- .6 Longitudinal Construction Joints
 - a) Use 10M deformed tie bars at 1,000 mm spacing, extending minimum 300 mm into both sides of the joint.
- .7 Leave the joint in place until the concrete has set, then carefully remove the joint form to avoid damaging the fresh concrete.
- .8 Finish the edges to a 6 mm radius.
- .9 Roughen all formed construction joints to expose the aggregate of the hardened concrete. The method of roughening laitance shall be subject to the approval of the Town. Alternatively, the Contractor may elect to apply a suitable retardant to the forms of the construction joint, and remove retarded surface mortar using low-pressure water jets or stiff brushes.

3.12 Joints Abutting an Existing Curb

- .1 Form a 10 mm wide by 30 mm deep slot between the back of the curb and the walk.
- .2 Fill the slot with an approved joint sealant.

3.13 Backfilling

- .1 Use only approved excavated or borrow material for fill.
- .2 Backfill behind curb with suitable clay within 7 days of concrete placement. Backfill a minimum 300 mm width behind the curb in two 150 mm lifts. Compact each lift with mechanical tampers to a minimum 95% Standard Proctor Density. Backfill to the top of curb elevation, unless walk construction immediately follows.

- .3 Backfill along the edge of the walk immediately following removal of formwork. Provide sufficient depth for topsoil placement as specified or directed by the Town. Compact backfill a minimum of 300 mm out from the walk edge with mechanical tampers, to a minimum 95% Standard Proctor Density.

3.14 Tolerances

- .1 Walk Surface, Gutter Surface, and Curb Top
 - a) Maximum 5 mm variation under a 3 m straightedge.
 - b) Where the specified tolerance is exceeded, correct such work to the satisfaction of the Town.
- .2 Gutter Lip and Walk Grade
 - a) Maximum 5 mm variation from the designated elevation at any station as established from the corresponding survey stake.
 - b) Where the specified tolerance is exceeded, correct such work to the satisfaction of the Town.
- .3 Gutter Lip Alignment
 - a) Maximum 10 mm variation over any 30 m section.
 - b) Where the specified tolerance is exceeded, correct such work to the satisfaction of the Town.
- .4 Walk and Crossing Thickness
 - a) At the direction of the Town, the independent testing agency shall take one or more sets of cores from walk or crossing. Each set shall consist of three cores that represent no more than 500 m² of walk or crossing. The average core thickness of the set shall be taken to represent the walk or crossing thickness for the sample area. Where the average core thickness is found to be deficient from that specified or directed by the Town, payment for the area represented by the core set shall be assessed a pay factor in accordance with the following table:

Thickness Deficiency (mm)	Pay Factor (% of Price)
< 5	100
5-9	90
10-15	75
> 15	Rejected

- b) Walk and crossing with excess thickness may be accepted if surface and grade tolerances are met, but no claim for additional payment will be accepted.

3.15 Rejected Work

- .1 Completely remove and replace rejected work to the limits of the nearest crack control or construction joints.

- .2 All rejected products and work shall be adequately removed from the site by the Contractor and corrected to the satisfaction of the Town, at the Contractor's sole expense.

3.16 Cleanup

- .1 Remove and dispose of all debris and excess material at the site at the end of each working day, and in a manner, acceptable to the Town.
- .2 Maintain the site and areas adjacent to the site in a condition acceptable to the Town, and in accordance with other applicable requirements of the Contract Documents.

- END OF SECTION 34 01 01.01 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for providing all concrete formwork, falsework, and slipforming required for the installation of curbs, gutters, sidewalks and slabs.

1.2 Quality Control

- .1 Refer to Section 01 45 00 - Quality Control.
- .2 Supply, erect, and dismantle concrete formwork and falsework in accordance with CAN/CSA-23.1 and CAN/CSA-S269.1, as applicable, and as specified herein.
- .3 The Contractor shall be responsible for the design of all formworks, falsework, and other appurtenances required for forming.

1.3 Related Work

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 22 00 – Measurement and Payment.
- .3 Section 34 01 01 – Concrete for Curbs, Gutters, Walks and Slabs.
- .4 Section 34 01 01.01 –Curbs, Gutters, Walks and Slabs.
- .5 Section 34 01 03 – Reinforcing for Curbs, Gutters, Walks and Slabs.

2.0 PRODUCTS

2.1 Formwork Materials

- .1 Formwork materials shall be in accordance with CAN/CSA-S269.3; plain, reusable, pre-coated plywood sheets or formed steel panels.
- .2 The use of forms that are dented, rough, out of shape, or otherwise unsuitable shall not be permitted.
- .3 The use of earth forms is prohibited, except where specifically authorized by the Town.

2.2 Falsework Materials

- .1 Falsework materials shall be in accordance with CAN/CSA-S269.1.

2.3 Form Ties

- .1 Form ties shall be removable or snap-off metal ties, fixed or adjustable length, and free of devices which may leave holes larger than 25 mm diameter in the concrete surface.

2.4 Form Release Agents

- .1 Form release agents shall be chemically active agents containing compounds that react with free lime in concrete resulting in water-soluble soaps.

2.5 Void Forms

- .1 Void forms, where required, shall be inert closed cell expanded polystyrene.
- .2 "Frost Cushion" by Beaver Plastics, or approved alternative.

2.6 Form Stripping Agent

- .1 The form stripping agent shall be colourless mineral oil, free of kerosene, with viscosity between 15 and 24 mm²/s at 40 °C, flashpoint minimum 150 °C, open cup method.

2.7 Slipform Equipment

- .1 Slipform equipment shall be of a design suitable to the Work, suitable for use with vibratory equipment, and capable of uniformly extruding, spreading, shaping, and consolidating freshly poured concrete into a dense, homogeneous formation.
- .2 The equipment should produce a concrete surface requiring minimal hand finishing.
- .3 The equipment shall be self-propelled and capable of automatically controlling alignment and grade.

3.0 EXECUTION

3.1 Fabrication and Erection

- .1 Verify lines, levels, centres, and dimensions against the Drawings prior to proceeding with fabrication and erection of formwork and falsework.
- .2 Where the Town authorizes the use of earth forms, hand trim the sides and bottom of the earth form, and remove excess material prior to placing concrete.
- .3 Fabricate and erect falsework in accordance with CAN/CSA-S269.1.
- .4 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 in such a manner to produce finished concrete conforming to the shapes, dimensions, locations, levels, and tolerances specified herein and required by CAN/CSA-A23.1.
- .5 Align form joints and make watertight. Lay out forms in such a manner to minimize the number of form joints.
- .6 Do not place shores or mud sills on frozen ground. Provide suitable drainage through the site to prevent washout of soil supporting mud sills and shores.
- .7 Use 25 mm chamfer strips on exterior corners and 25 mm fillets on interior corners of concrete members, unless otherwise specified or directed by the Town.

- .8 Form chases, slots, openings, drips, recesses, and expansion and control joints where required.
- .9 Build in anchors, sleeves, and other inserts required to accommodate work specified in other sections and on the Drawings. Ensure that anchors and inserts are installed such that they will be flush with the finished concrete surface.

3.2 Slipforming

- .1 Set and maintain a grade line by establishing a taut string or wire line, set against the Town's survey control datum.
- .2 Provide stable support for the traveling slipform machine.
- .3 Protect adjacent work and property from damage. Repair any damage caused during the performance of the Work to the satisfaction of the Town.
- .4 Coordinate concrete delivery and placement to maintain uniform advancement of the slipforming operation without interruption. If progress is interrupted at any time, immediately suspend vibrating and tamping.
- .5 Maintain adequate slump to prevent slipformed concrete from sagging.
- .6 Slipformed surfaces shall be smooth, dense, and free of pockets and honeycombing.
- .7 Correct minor irregularities in the slipformed finish using hand finishing methods.

3.3 Form Removal

- .1 Review and confirm the timing for removal of forms with the Town in all cases.
- .2 Strip forms within 48 hours of concrete placement to facilitate finishing operations.
- .3 Re-shoring to remove forms shall be done in accordance with CAN/CSA-S269.1.

3.4 Cleanup

- .1 Remove and dispose of all debris and excess material at the site at the end of each working day, and in a manner, acceptable to the Town.
- .2 Maintain the site and areas adjacent to the site in a condition acceptable to the Town, and in accordance with other applicable requirements of the Contract Documents.

- END OF SECTION 34 01 02 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for providing all concrete reinforcement required for the installation of curbs, gutters, sidewalks and slabs.

1.2 Quality Control

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Install steel reinforcement in accordance with CAN/CSA-23.1 and CAN/CSA-W186, as applicable, and as specified herein.
- .3 Upon request by the Town, submit a certified copy of the mill test report for the proposed reinforcing steel, clearly indicating the results of physical and chemical analyses. Submit the report to the Town for review and approval at least 10 days in advance of ordering reinforcing steel.
- .4 Submit steel reinforcement shop drawings clearly indicating reinforcing placement, bar bending details, quantity of reinforcement, sizes, spacing, and lists. Detail lap lengths and bar development lengths in accordance with CAN/CSA-A23.2. Locate laps in coordination with the location of construction joints. Prepare reinforcement shop drawings in accordance with the Reinforcing Steel Manual of Practice by the Reinforcing Steel Institute of Canada, as applicable.

1.3 Related Work

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 22 00 – Measurement and Payment.
- .3 Section 34 01 01 – Concrete for Curbs, Gutters, Walks and Slabs.
- .4 Section 34 01 01.01 – Curbs, Gutters, Walks and Slabs.
- .5 Section 34 01 02 – Formwork for Curbs, Gutters, Walks and Slabs.

2.0 PRODUCTS

2.1 Reinforcing Steel

- .1 Reinforcing steel shall be grade 400, billet steel, deformed bars in accordance with CAN/CSA-G30.18, unless otherwise specified or directed by the Town.
- .2 Weldable, low alloy steel deformed bars, where specified, shall duly conform to CAN/CSA-G30.18.

2.2 Tie Bars

- .1 Tie bars shall be grade 300, billet steel, uncoated, deformed bars in accordance with CAN/CSA-G30.18, unless otherwise specified or directed by the Town.
- .2 Epoxy-coated tie bars, where specified, shall conform to ASTM-D3963.

2.3 Steel Dowels

- .1 Steel dowels shall be clean, straight, free of flattened or burred ends, uncoated and in accordance with CAN/CSA-G30.18.
- .2 Epoxy-coated tie bars, where specified, shall conform to ASTM-D3963.

2.4 Cold-Drawn Steel Wire

- .1 Cold-drawn steel wire shall be uncoated and in accordance with CAN/CSA-G30.5M.
- .2 Epoxy-coated cold-drawn steel wire, where specified, shall conform to ASTM-D3963.

2.5 Welded Steel Wire Fabric

- .1 Welded steel wire fabric shall uncoated and in accordance with CAN/CSA-G30.5M.
- .2 Epoxy-coated welded steel wire fabric, where specified, shall conform to ASTM-D3963.

2.6 Tie Wire

- .1 Tie wire shall be cold-drawn, annealed steel in accordance with CAN/CSA-G30.3.

2.7 Epoxy Coatings

- .1 Epoxy coatings shall be in accordance with ASTM-D3963.

2.8 Galvanizing

- .1 Galvanizing shall be in accordance with CAN/CSA-G 164.

2.9 Plain Round Bars

- .1 Plain round bars shall be in accordance with CAN/CSA-G40.2I.

2.10 Chairs, Bolsters, Bar Supports, and Spacers

- .1 Chairs, bolsters, bar supports, and spacers shall be suitable for strength and support of reinforcing and live loads during construction.

3.0 EXECUTION

3.1 Fabrication, Shipping, and Handling

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1 and ACI-315-Details and Detailing of Concrete Reinforcement.
- .2 Where approved or directed by the Town, weld reinforcement in accordance with CAN/CSA-WI86.
- .3 Ship bundles of bar reinforcement clearly identified with bar bending details and lists.

- .4 Protect epoxy- and paint-coated portions of bars with adequate covering during shipping and handling.

3.2 Field Bending and Welding

- .1 Field bending and welding shall only be permitted where specifically authorized by the Town.
- .2 Field bending shall be performed without the use of heat, by applying slow and steady pressure.
- .3 Remove and replace any bars that develop cracks or splits.

3.3 Placing Reinforcement

- .1 Place reinforcement as indicated on approved shop drawings and in accordance with CAN/CSA-A23.1.
- .2 Place sufficient chairs, tie wires, and supports to adequately maintain the position of the reinforcement during placement of the concrete, in accordance with the tolerances provided by the referenced CAN/CSA guidelines.
- .3 Use plain round bars as slip dowels in concrete where required. Apply asphalt paint to the end of the dowel intended to move with the hardened concrete. When the paint is dry, apply a coat of mineral lubricating grease.
- .4 The Town shall inspect reinforcement placement before concrete placement is permitted.
- .5 Ensure sufficient cover is achieved over reinforcement when placing concrete.
- .6 Reinforcing steel, anchor bolts, or other inserts shall not be inserted during concrete placement.

3.4 Field Touch-Up

- .1 Touch-up all damaged and cut ends of epoxy-coated, painted, or galvanized reinforcing with compatible finish to provide a continuous finish.

- END OF SECTION 34 01 03 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for stockpiling and processing aggregates to be stockpiled or incorporated into work.

1.2 Quality Assurance

- .1 Refer to Section 01 45 00 – Quality Control.

1.3 Quality Control

- .1 The quality assurance laboratory will conduct sieve analyses to ASTM C136 and other tests to ensure that the aggregate meets the requirements for ACB and ACO asphalt and for granular base.
- .2 A minimum of one sieve analysis per 500 tonnes of aggregate supplied.
- .3 If the aggregate fails to meet the specified gradation, the contractor shall suspend gravel placement.
- .4 Evaluations of Tests: The average grading of the first 8 consecutive sieve tests shall conform to the specified grading band. If not adjust the production process so that the average grading of material already produced and that produced in the next 8 consecutive sieve tests will conform to specifications. Failing this, do not supply aggregate represented by the nonconforming average of 16 tests.

The preceding evaluation will be repeated for the subsequent series of 8 consecutive tests.
- .5 Each truck load of aggregate weighed in shall have a scale ticket filled out and submitted to the Town.

1.4 Related Sections

- .1 Section 34 02 01 – Granular Base
- .2 Section 34 01 00 – Subgrade Preparation

2.0 PRODUCTS

2.1 Materials

.1 Aggregate gradations shall conform to the requirements for the following:

a) Granular Base (Des.2 Class 20) (CAN/CGSB-8.2-M)

Sieve Size	Percent Passing
20.0 mm	100
16.0 mm	84 – 94
10.0 mm	63 – 86
5.0 mm	40 – 67
1.25 mm	20 – 43
630 µm	14 – 34
315 µm	9 – 26
160 µm	5 – 18
80 µm	2 – 10

b) Granular Sub-Base (Des.2 Class 40) (CAN/CGSB-8.2-M)

Sieve Size	Percent Passing
20.0 mm	100
16.0 mm	55 – 85
10.0 mm	44 – 74
5.0 mm	32 – 62
1.25 mm	17 – 43
630 µm	12 – 34
315 µm	8 – 26
160 µm	5 – 18
80 µm	0 – 10

Granular materials for base courses shall comply with the following:

Aggregate Property	Tolerance
Coarse aggregate (> 5,000 µm) with ≥ 2 fractured faces (by mass)	60% minimum
Plasticity index (< 400 µm)	6 maximum
Liquid Limit	25 maximum
Lightweight pieces (by mass)	2% maximum

c) Sand for backfill of trenches and pipe bedding shall comply with the following gradation.

Sieve Size	Percent Passing
12.5 mm	100
5 mm	90 - 100
1.25 mm	55-85
0.315 mm	10-35
0.080 mm	0-5

- d) Sand for horticultural use shall be free of vegetation, clay balls, or other foreign material and shall comply with the following gradation.

Sieve Size	Percent Passing
2.50 mm	100
1.25 mm	90-100
800 micro-m	80-90
315 micro-m	30-60
160 micro-m	2-10
63 micro-m	< 1

- e) Pit-run gravel shall be maximum size 75 mm complying with the following gradation:

Sieve Size	Percent Passing
50 mm	100
40 mm	80-100
20 mm	50-75
10 mm	25-55
5 mm	2-10

- f) Gravel for stabilization of trench bottoms

Granular Material (Import Gravel) Imported gravel shall be a well graded mixture of sand and gravel meeting the following gradation:

Sieve Size	Percent Passing
80.0 mm	100
50.0 mm	80 – 100
25.0 mm	50 – 75
5.0 mm	25 – 55
80 µm	2 – 10

- g) Screened rock - Screened rock shall be composed of sound, hard uncoated particles free from clay lumps, flaky particles, soft shale, friable materials, roots, vegetable matter and frozen lumps meeting the following gradation:

Sieve Size	Percent Passing
50.0 mm	100
40.0 mm	95 – 100
20.0 mm	5 – 10
10.0 mm	0 – 5
5.0 mm	0 – 5

- h) Crushed Gravel - Crushed gravel shall be maximum size 25 mm complying with the following gradation.

Sieve Size	Percent Passing
25 mm	100
19 mm	95-100
9.50 mm	60-80
4.75 mm	40-60
2.00 mm	25-45
425 micro-m	10-25
75 micro-m	2-10

- i) Coarse aggregate is the total aggregate retained on a 5 mm sieve. Fine aggregate is the total aggregate which passes through a 5 mm sieve.

- .2 Crushed aggregate shall consist of sound, hard and durable particles of sand, gravel and rock, free of flaky particles, soft shale, coal, ironstone, clay lumps, organic material and other deleterious material.

3.0 EXECUTION

3.1 Processing

1. Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
2. Adjust and modify aggregate as required to meet gradation requirements by aggregate splitting, elimination of fines, or blending with sand.

3.2 Handling

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

3.3 Stockpiling

- .1 Stockpile aggregates on site in locations designated. Do not stockpile on completed pavement surfaces.
- .2 Stockpile sites shall be level, well drained and of adequate bearing capacity and stability to support stockpiled materials.

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements supplying, placing and compacting imported aggregate into a base or sub-base to the cross section as indicated on the plans or as directed by the Town.
- .2 Scarifying, shaping and compacting existing granular base or sub-base to the cross section as indicated on the plans or as directed by the Town.

1.2 Quality Assurance

- .1 Refer to Section 01 45 00 – Quality Control.

1.3 Quality Control

- .1 Maximum Density: the dry unit mass of a sample of soil at a optimum moisture content as determined according to ASTM-D698 method A.
- .2 Required Densities:
 - a) Minimum of 100% of the maximum density for each 150 mm lift of subgrade under pavement structures, concrete; curb & gutter, curb ramps, alley and access crossings
 - b) Minimum of 98% of the maximum density for each 150 mm lift of subgrade under concrete sidewalks, asphalt trails.
- .3 Testing Frequency to ASTM-D1556 , ASTM-D2922,ASTM-D2167 or ASTM- D2922 for comparison with a maximum density determined according to ASTM D698 Method A:
 - a) Fill – one for each 2,000 m² of compacted lift.
 - b) Subgrade – one for each 1,000 m² of compacted lift.
 - c) Base course – one for each 500 m² of compacted lift.
 - d) Sieve Analyses ASTM – C136 for each 1,000 tonnes of aggregate.
- .4 Proof Rolling: a proof roll of the finished subgrade will be required to confirm adequate bearing capacity of the subgrade soil. Proof rolling will be supervised by the Town according to the Town's recommendations. Proof rolling will be done using a single axle dual wheel truck loaded to a minimum 9100 kg on the rear axle. Tires to be inflated to a minimum 275 KPa.
- .5 The Contractor shall perform as many tests as are necessary to ensure that the work conforms to the requirements of the Contract regardless of the minimum number specified at the expense of the Contractor.

1.4 Related Sections

- .1 Section 34 02 00 - Aggregate
- .2 Section 34 12 16 10 - Hot Mix Asphalt Concrete

2.0 PRODUCTS

2.1 Materials

- .1 Granular base material to Section 34 02 00 Aggregate, as indicated on the drawings.

2.2 Equipment

- .1 Use graders rollers and water truck and other equipment of adequate design and capacity to produce a granular base or sub-base to specified depth and cross section.

3.0 EXECUTION

3.1 Preparation

- .1 The prepared subgrade shall be inspected by the Town before placing granular course.
- .2 Place aggregate and in uniform layers not exceeding 150 mm thickness when compacted.
- .3 If segregation occurs, blade lift and mix thoroughly or remove and replace before final spreading and shaping to line and grade.
- .4 Bring the moisture content of the aggregate to near optimum and compact to required density.
- .5 Finished surface of the granular base shall meet:
 - a) Surface Tolerance, 15 mm maximum variation under 3 m straightedge.
 - b) Grade Tolerance, 6 mm maximum variation above design elevation and 15 mm maximum variation below design elevation.

3.2 Tolerances

- .1 Trim high spots and refinish surface to within tolerance.
- .2 Add approved aggregate to low areas, scarify and blade, respreads and recompact to required density and refinish surface at the contractor's expense. Fill low areas with extra thickness of subsequent granular sub-base or base course at the contractor's expense.
- .3 If a density test result is less than the required density, the test result is discarded and 3 retests shall be performed on the area represented by the failed test. The average of the 3 tests shall represent the density of that area. If this average is less than the required density, the area shall be reworked to the full depth of the lift, the soil moisture altered as necessary and recompacted to the required density. If the area is not retested but is reworked and recompacted the area shall be tested at the normal testing frequencies.
- .4 The Contractor shall assume the risk of uncovering and reworking the subgrade if it is covered before the Town has accepted the test result.

3.3 Protection of Finished Work

- .1 Do not permit vehicle traffic on the compacted granular base prior to paving.
- .2 If the subgrade floods, drain immediately by natural flow or by pumping into catch basins, manholes or ditches. This work shall be done at the contractor's expense.
- .3 Repair any damage including freezing to granular base and retest as required by the Town prior to paving.

- END OF SECTION 34 02 01 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the production of a hot mixture of asphalt binder and aggregates for paving.

1.2 Definitions

- .1 Asphalt Concrete Base (ACB): Base course for arterials, industrial and commercial roadways, and collectors.
- .2 Asphalt Concrete Overlay (ACO): Surface paving for arterials, industrial and commercial roadways, and collectors.

1.3 Quality Control

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Submit refinery product data including temperature-viscosity curves for each source.
- .3 Submit a mix design for each required asphalt concrete mix type. No concrete production may proceed until the submitted mix design has been reviewed and approved by the Town. The mix design for each job-mix formula shall include the proportions of materials and plant settings as follows:
 - a) For batch plant production:
 - Sieve analysis of combined aggregate in the mix;
 - Sieve analysis of aggregate in each bin separation to be used;
 - Mass of material from each bin for each batch;
 - Mass of asphalt binder for each batch;
 - Mixing temperature of asphalt from the temperature-viscosity curve.
 - b) For continuous or drum-mix plant production:
 - Sieve analysis of combined aggregate in the mix;
 - Mass of asphalt binder per tonne of mix;
 - Mixing temperature of asphalt from the temperature-viscosity curve;
 - Settings of aggregate and asphalt feed systems.
- .4 Submit mill tests.
- .5 Submit a quality control plan consisting of a minimum of two (2) tests per production day by an independent testing agency, each with a minimum of three (3) Marshall specimens taken per test, and including the following minimum requirements for testing of each mix type:
 - Asphalt content
 - Air voids
 - Stability
 - Flow
 - Film thickness
 - Moisture content in concrete

- Gradation in concrete
- Plant discharge temperature
- Asphalt storage temperature

A copy of these test results shall be provided to the Town at the end of each week of production.

- .6 Submit abrasion and soundness test results for each aggregate source. Submit sieve analysis and crushed face count results for the aggregate stockpile at the time of award.
- .7 Submit a copy of the current plant scale certificates.
- .8 All submittals shall be submitted to the Town for review and approval at least ten (10) days in advance of hot-mix production and for each subsequent change in supplier or source of materials.
- .9 Preliminary approval of materials does not constitute general acceptance. Acceptance depends on satisfactory field test results and performance in place.

1.4 Quality Assurance

- .1 In addition to quality control provided by the Contractor and field inspections by the Town, the Contractor will retain the services of an independent testing agency, as approved by the Town, to conduct plant inspections, materials sampling, and testing as follows:
 - a) Weekly asphalt plant inspections during production will be conducted to verify plant calibrations, operation, production settings, temperatures, and handling procedures. Samples of materials and mixtures will be taken and tested.
 - b) Samples of asphalt cement will be taken weekly for each source and tested for penetration and kinematic viscosity.
 - c) A minimum of one (1) compacted Marshall specimen shall be tested for density for each 1,000 tonnes of hot-mix asphalt concrete, or for each production day, whichever is less.
 - d) Quality control testing as stipulated in Articles 1.3.5
 - e) A minimum of one (1) sieve analysis, to ASTM-C136, and crushed face count for every 1,000 tonnes of aggregate used in asphalt concrete production.
 - f) The testing agency will test a trial batch of the job-mix formula to verify the mix design. The mix design and job-mix formula will not be approved until successful results are obtained.
- .2 A copy of all testing results shall be submitted to the Town at the end of each production week, or more frequently if directed by the Town.

1.5 Related Work

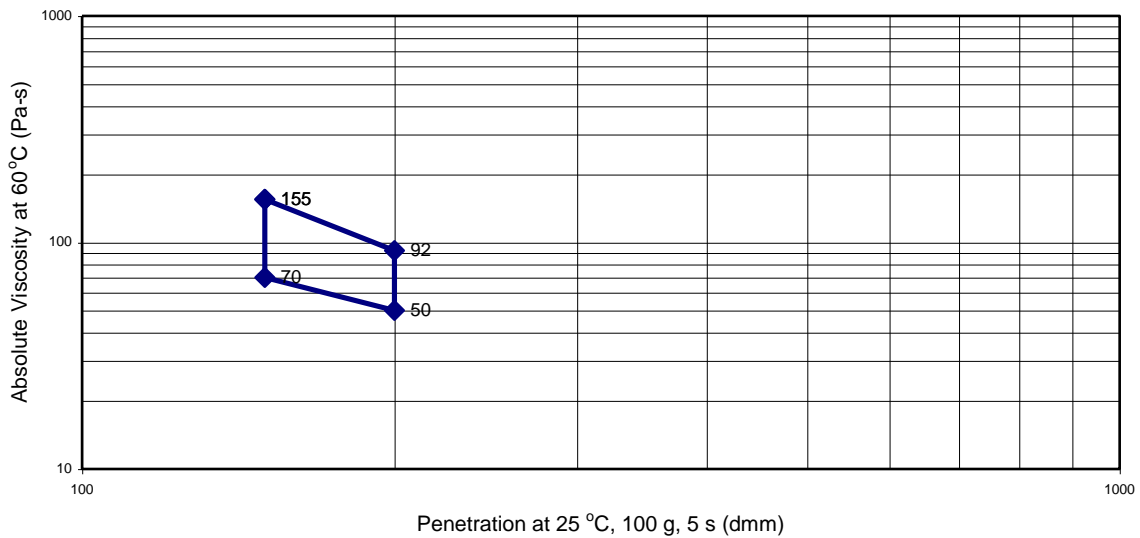
- .1 Section 33 12 16 – Asphalt Paving

2.0 PRODUCTS

2.1 Asphalt Cement

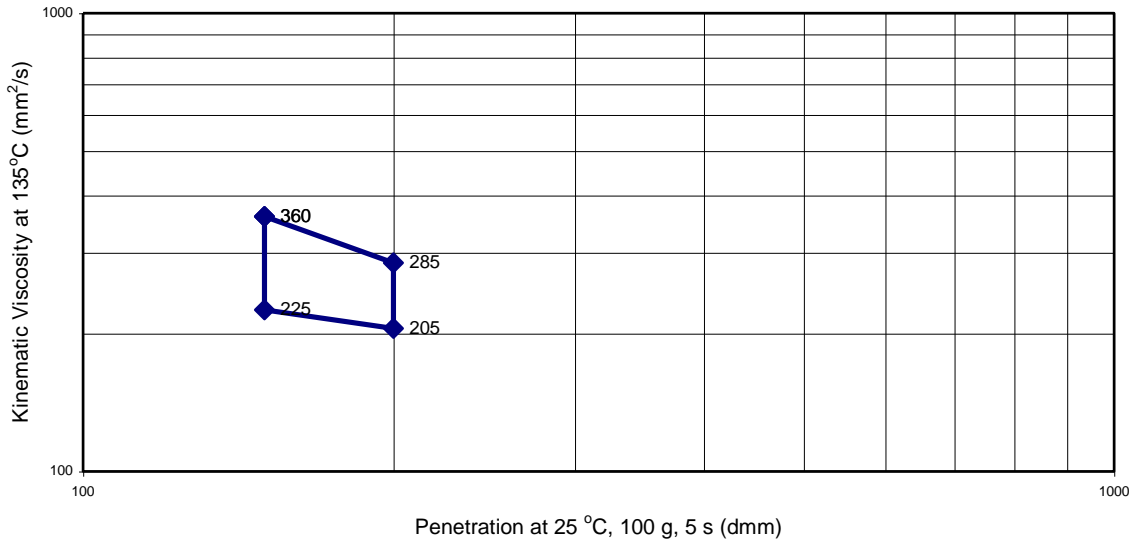
- .1 The asphaltic binder shall be prepared by the refining of petroleum, uniform in character, shall not foam when heated to 175 °C, and shall meet the following requirements:
- a) Binder grade shall be PG 52-34, as specified in Alberta Transportation's Standard Specifications for Highway Construction – Edition 16, 2019.
 - b) Absolute viscosity, to ASTM-D2171, and penetration, to ASTM-D5, must fall within the area plotted on the following log-log scale chart:

Asphalt Cement Absolute Viscosity



- c) Kinematic viscosity, to ASTM-D2170, and penetration, to ASTM-D5, must fall within the area plotted on the following log-log scale chart:

Asphalt Cement Kinematic Viscosity



- d) Flash point, by Cleveland Open Cup Method, to ASTM-D-92, minimum 205 °C.
- e) Solubility in Trichloroethylene, to ASTM-D2042, minimum 99.5%.
- f) Absolute viscosity tests, to ASTM-D2171, on residue from Thin Film Oven Test, to ASTM-D1754, shall yield a maximum ratio of absolute viscosity of residue to the absolute viscosity of the asphaltic binder of 4.0.
- g) Ductility at 25 °C, to ASTM-D113, maximum 100 cm.
- .2 The temperature at delivery to the site shall be between 135 and 175 °C.

2.2 Aggregate

- .1 Aggregate for ACO and ACB shall comply with the following gradation:

Sieve Size	Percent Passing
12.5 mm	100
10.0 mm	85 - 92
5.0 mm	50 - 78
800 µm	27 - 45
63 µm	4 - 10

- .2 Coarse aggregate is the total aggregate retained on a 5 mm sieve. Fine aggregate is the total aggregate which passes through a 5 mm sieve.
- .3 Aggregate shall comply with the following:

Aggregate Property	Type	
	ACB	ACO
Coarse aggregate (> 5,000 µm) with ≥ 2 fractured faces (by mass)	60% minimum	60% minimum
Plasticity index < 400 µm (by mass)	0%	0%
L.A. abrasion wear (by mass)	32% maximum	32% maximum
Soundness loss (by mass)	16% maximum	16% maximum
Lightweight pieces (by mass)	2% maximum	2% maximum

- .4 Aggregate shall be sound, hard, and durable, free of elongated particles, soft shale, clay lumps, organic material, and other deleterious material.
- .5 Fine aggregate shall contain 75-85% (by mass) of manufactured or crushed fines. Pit run material shall be pre-screened to remove natural sand and then crushed to produce manufactured fines.
- .6 Mineral filler shall be added may be added as necessary to meet the specified gradation, where authorized by the Town. Mineral filler may consist of Portland Cement, fly ash, ground limestone, or such other commercially ground stone dust, as approved by the Town. Mineral filler shall have a plasticity index of zero and shall conform to the following gradation:

Sieve Size	Percent Passing
400 µm	100
160 µm	90 minimum
80 µm	70 minimum
45 µm	62 minimum

2.3 Asphalt Plant

- .1 The asphalt mixing plant shall conform to ASTM-D995 and shall be capable of consistently producing a homogeneous mixture in which all aggregate particles are uniformly and thoroughly coated with asphalt.
- .2 Plant production shall not unless Weights and Measures, Canada Consumer and Corporate Affairs have certified all plant scales prior to the start of the construction season, and as often as deemed necessary by the Town to ensure accuracy.
- .3 Plant production shall not proceed until plant calibration and recalibration have been reviewed by the Town on the Site. Provide the Town with at least one (1) day of advanced notice of any plant calibrations.
- .4 Provide the Town free and safe access to the plant to verify proportions, settings, temperatures, and to take samples.
- .5 The plant shall be operated in accordance with the Alberta Environmental Protection Code of Practice. The Contractor shall provide proof of registration with Alberta Environmental Protection.

2.4 Mix Design

- .1 The mix design shall be carried out by a qualified laboratory following the Marshall Method of Mix Design, and conforming to Mix Type M1 of Alberta

Transportation's Standard Specifications for Highway Construction – Edition 16, 2019, including:

Mix Type	ACB	ACO
Maximum size of aggregate	12.5 mm	12.5 mm
Number of blows	75	75
Minimum stability	8.0 kN	8.0 kN
Flow value	2.0 – 3.5 mm	2.0 – 3.5 mm
Air voids (% of total mix)	3.75% ± 0.25%	3.75% ± 0.25%
Voids filled	65 – 75%	65 – 75%
Minimum crushed face count	70%	70%
Minimum film thickness	6.0 µm	6.0 µm

- .2 The Contractor shall not use any job-mix formula other than that approved by the Town. The approved job-mix formula shall be posted in clear view of the plant operator during production.
- .3 The mix design shall be carried out by a qualified laboratory following the Marshall Method of Mix Design, and conforming to the following criteria:

2.5 Tolerances

- .1 The following specifies the tolerances for allowable variation from the approved mix design. If any one of the following mix property tolerances are not met, mix production shall be suspended until the Contractor can demonstrate, to the satisfaction of the Town, that corrective measures have been taken to produce a mix that meets specifications.
- .2 Aggregate Gradation:

Sieve Size	Percent Passing by Mass	
	Individual Sample	Average of Last 10 Samples
5.00 mm	± 5.0	± 3.0
1.25 mm	± 4.0	± 2.5
630 µm	± 3.0	± 2.0
315 µm	± 3.0	± 2.0
160 µm	± 2.0	± 1.5
80 µm	± 1.5	± 1.0

- .3 Asphalt Content:
 - a) ± 0.3% from the approved mix design.
- .4 Mixing Temperature:
 - a) ± 9 °C from the approved mix design.

3.0 EXECUTION

3.1 Storage, Protection, and Handling of Aggregate

- .1 Place aggregate in horizontal lifts of 750 mm maximum thickness.
- .2 Avoid segregation of particle sizes.

- .3 Draw aggregate from stockpiles in a manner that mixes the full depth of the stockpile.
- .4 Do not blend aggregates in a stockpile.

3.2 Asphalt Concrete Production

- .1 Asphalt concrete production and handling shall be in accordance with the Asphalt Plant Manual, Asphalt Institute Manual Series No. 3 (MS-3).
- .2 The production rate shall be compatible with the rate of placement and compaction.

- END OF SECTION 34 12 16.10 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the supply and installation of hot-mix asphalt concrete for pavement base, surface, or overlay.

1.2 Quality Control

- .1 Refer to Section 01 45 00 – Quality Control.
- .2 Submit refinery product data for prime coat and tack coat products to the Town for review at least ten (10) days prior to commencing coating activities.
- .3 Testing laboratories or agencies shall be independent testing agencies approved by the Town. The approved testing agencies shall perform all testing.

1.3 Quality Assurance

- .1 Density
 - a) A minimum of one compacted Marshall Specimen shall be tested for density for each 1,000 tonnes of hot-mix asphalt concrete, or for each production day, whichever is less.
 - b) Cores will be drilled from a compacted mat placed from the same load of hot-mix asphalt concrete from which the specimen was taken, and tested for density.
 - c) Pavement compaction will be accepted or rejected based on the ratio, in percent, of the core density to the density of the compacted Marshall specimen.
 - d) If the initial core density is below that specified, that initial core density will be discarded and three new cores will be taken within 10 m of the original core location, all within 2.5 m of each other. The average density of the three cores will represent the mat density in that area.
- .2 Thickness
 - a) A minimum of one core shall be tested for thickness for each 1,000 m² of asphalt pavement, for each stage of paving. Staged paving being the process whereby a lift or lifts, forming part of the total pavement structure, are deferred to a future date.
 - b) A thickness deficiency at the completion of the first stage of paving may be accepted by the Town provided the deficiency is less than 12 mm and the deficient thickness can be included in the subsequent stage of paving.
 - c) If the initial core thickness remains deficient at the completion of the final lift of paving, that initial core thickness will be discarded and three new cores will be taken within 10 m of the original core location, all within 2.5 m of each other. The average thickness of the three cores will represent the mat thickness in that area.

1.4 Related Work

- .1 Section 33 12 16.10 – Hot-Mix Asphalt Concrete.

2.0 PRODUCTS

2.1 Prime Coats and Tack Coats

- .1 Prime coat shall be type MC-30 (medium curing) asphalt conforming to Table 1, or grade SS-1 anionic emulsified asphalt, conforming to Table 2.
- .2 Tack coat shall be type RC-30/70 (rapid curing) asphalt conforming to Table 1, or grade SS-1 anionic emulsified asphalt, conforming to Table 2.

Table 1 – Specifications for Medium and Rapid Curing Asphalts:

Asphalt Grade Requirements	ASTM Test	MC-30		RC-30		RC-70	
		Min	Max	Min	Max	Min	Max
Flash point, open tag, °C	D1310	38	-	-	-	-	-
Kinematic viscosity at 60 °C, mm ² /s	D2170	30	60	30	60	70	140
Distillation test:							
% by volume of total distillate to 360 °C							
190 °C	D402	-	-	15	-	10	-
225 °C		-	25	55	-	50	-
260 °C		40	70	75	-	70	-
315 °C		75	93	90	-	85	-
Residue from distillation to 360 °C							
Volume % by difference		50	-	50	-	55	-
Test on residue from distillation:							
Penetration at 25 °C, 100 g, 5 s, dmm	D5	120	250	80	120	80	120
Ductility at 25 °C, cm	D113	100	-	100	-	100	-
Solubility in trichloroethylene, % by mass	D2042	99.5	-	99.5	-	99.5	-
Water, % by mass or volume	D95	-	0.2	-	0.2	-	0.2
Delivery temperature, °C	-	35	55	35	55	55	75

Table 2 – Specifications for Anionic Emulsified Asphalts:

Asphalt Grade Requirements	ASTM Test	SS-1	
		Minimum	Maximum
Absolute viscosity at 25 °C, Pa·s	D244	20	60
Residue by distillation, % by mass	D244	55	-
Settlement in 5 days, % difference by mass	D244	-	5
Storage stability test, 24 hr, % by mass	D244	-	1
Retained on No. 1000 sieve, % by mass	D244	-	0.10
Cement mixing test, % by mass	D244	-	2.0
Tests on residue from distillation:			
Penetration at 25 °C, 100 g, 5 s, dmm	D5	100	200
Ductility at 25 °C and 5 cm/min, cm	D113	60	-
Solubility in carbon tetrachloride, % by mass	D2042	97.5	-
Delivery temperature, °C		40	70

- .3 Asphalt coats shall be uniform in character and shall have a refined petroleum base.
- .4 The asphalt coat shall not foam when heated to the application temperature range.
- .5 All tests on coats shall be completed within 15 days of the date of delivery. The settlement test may be waived where the coat is applied within 5 days of delivery. The 24-hour storage test may be used in lieu of the 5-day settlement test. In the case of a dispute with respect to the results of these two tests, the 5-day settlement test shall govern.
- .6 Dilute SS-1 emulsified asphalt with an equal amount of water for a 50% concentration.
- .7 Application rates shall be as follows:

Asphalt Type or Grade	Application Rate
SS-1	$0.5 \pm 0.2 \text{ L/m}^2$
MC-30	$1.5 \pm 0.5 \text{ L/m}^2$
RC-30/70	$0.3 \pm 0.1 \text{ L/m}^2$

2.2 Hot-Mix Asphalt Concrete

- .1 Refer to Section 33 12 16.10 – Hot-Mix Asphalt Concrete.

2.3 Equipment

- .1 Tack or Prime Coat Distributor
 - a) Distributor shall be self-powered, equipped with a tachometer, pressure gauge, thermometer, adjustable-length spray bar, positive displacement asphalt pump with separate power supply, heating coils, and a burner for even heating of asphalt.
 - b) The distributor shall be capable of maintaining a constant speed and distributing a uniform application of liquid asphalt over an area 4 m wide at the specified application rate.
 - c) The distributor shall also be equipped with a hand spray wand connected to a pressure distributor and capable of providing uniform application of liquid asphalt manually.
- .2 Concrete Transport Vehicles
 - a) Trucks shall be of suitable size and capacity to be compatible with paving equipment.
 - b) Waterproof tarpaulins, of sufficient size, shall be used to completely cover all material in the box when fully loaded.
 - c) The side of the box shall have a 12 mm diameter hole 300 mm from the bottom of the box to allowing checking of the mix temperature.

- .3 Paver
 - a) Paver shall be self-propelled with automatic screed controls to maintain grade from a reference stringline and to control crossfall, smoothness, and joint matching.
 - b) The paver shall also be equipped with a vibratory screed with extensions and augers capable of uniformly spreading the mixture to specified widths and depths without segregation or tearing.
- .4 Rollers
 - a) Rollers shall be self-propelled and reversible with static, steel-tired or pneumatic-tired rollers, or vibratory rollers. Pneumatic-tired rollers shall be equipped with wind skirts.
 - b) The rollers shall be equipped with wetting and scraping devices to prevent adhesion. Petroleum derivatives are not permitted for cleaning.
 - c) Rollers shall be capable of attaining the specified density and smoothness, and shall be able to obtain such within the available compaction time and compatible with the rate of hot-mix asphalt concrete placement.

3.0 EXECUTION

3.1 General

- .1 Refer to the Asphalt Paving Manual, Asphalt Institute Manual Series No. 8 (MS-8), latest edition, for guidance with respect to good paving practice insofar as is consistent with the requirements of this section.

3.2 Preparation

- .1 Clean the surface to be paved.
- .2 Remove and dispose of all debris and accumulations of deleterious material at a site located by the Contractor and acceptable to the Town.
- .3 Where necessary, raise valve boxes, manhole covers, catch basin grates, and other existing appurtenances to the finished grade of the pavement. The Contractor shall be responsible to ascertain the type and amount of materials required to raise such appurtenances to the finished grade, and shall supply and install such materials to the satisfaction of the Town.
- .4 Notify the Town at least two (2) days in advance of prime coating or tack coating operations to allow inspection of prepared the surface.
- .5 Where specified or directed by the Town, spread a leveling course of hot-mix asphalt concrete with a paver in lifts not exceeding 75 mm compacted thickness and compact the leveling course lifts to the specified density.

3.3 Prime and Tack Coats

- .1 Protect property and appurtenances adjacent to areas intended to be prime coated or tack coated. Remove any spattering stains or overspray caused during prime coating or tack coating to the satisfaction of the Town.
- .2 Do not apply liquid asphalt when the prevalent weather is foggy, rainy, windy, or when the air temperature is 2 °C or less, unless authorized by the Town.
- .3 For prime coats:
 - a) Apply the prime coat while the soil cement surface is still moist.
 - b) Do not allow traffic on prime coat within 6 hours of application or until the prime coat has cured.
- .4 For tack coats:
 - a) The prepared pavement surface shall be dry and free of dust and other material that may prevent satisfactory bonding of the tack coat.
 - b) Apply tack coat within 24 hours of paving.
 - c) Use traffic barriers to prevent tracking of uncured tack coat. Do not open the surface to traffic until the tack coat is properly cured.
- .5 Spray prime coat or tack coat in a uniform coat over the full area to be paved. For tack coats, spray the sides of gutters, catch basins, manholes, and other appurtenances.
- .6 Avoid spraying to an extent that ponding occurs.
- .7 Hand spray areas that may have been missed or which are inaccessible by the mechanical distributor.
- .8 Any damage to the prime coat or tack coat caused by traffic or the Contractor's operations prior to complete curing of the coat shall be corrected by the Contractor at its sole expense.
- .9 Let the prime coat or tack coat completely cure before proceeding with paving.

3.4 Asphalt Paving

- .1 No paving activities can commence until the Town has inspected the prime coat or tack coat.
- .2 Do not pave when rain or snow is imminent, or when the surface is wet, icy, snow-covered or frozen within 150 mm of the surface, unless authorized by the Town.
- .3 Do not pave when the air temperature is 2 °C or less, or during excessive wind conditions, unless authorized by the Town.
- .4 Transport of Asphalt Concrete
 - a) Transport the asphalt concrete in approved trucks with protective covers secured over the box to prevent funneling air movement under the cover during transport.

- b) Prior to loading asphalt concrete, thoroughly clean the box of any accumulation of asphaltic material or other deleterious material. Lubricate the inside box surfaces with a light coating of soap or other detergent solution. Petroleum derivatives are not permitted.
- c) Maintain transport vehicles clean of mud and other matter that may contaminate the paving area.
- d) Discharge asphalt concrete into the paver hopper without spilling and without the truck box bearing against the hopper.
- e) Where payment for paving is by unit weight of asphalt concrete, no payment shall be made unless the Town is provided with a copy of the corresponding asphalt mix load ticket immediately upon delivery to the Site.

.5 Mechanical Spreading

- a) Spread the hot-mix asphalt concrete with the paver moving at a uniform speed compatible with the rate of compaction rolling.
- b) The spreading temperature shall be between 125 and 150 °C, as measured in the mat immediately behind the paver.
- c) Spread the asphalt concrete in one or more lifts, or as directed by the Town, to a depth sufficient to obtain the following mat thickness:

Mix Type	Minimum (mm)	Maximum (mm)
ACO	35	75
ACB	65	100

- d) If segregation of the mixture occurs, immediately suspend spreading activities until the cause of segregation is determined and rectified.
- e) Prior to roller compaction, remove fat spots, sandy accumulations, high spots, low spots, and any other irregularities, and repair with hot-mix asphalt concrete. Scratch the surface with rake tines to ensure adequate bonding of the added mix. Do not broadcast loose material that has been raked off onto the mat.

.6 Hand Spreading

- a) Hand spread asphalt concrete in areas which are not accessible by the paver, or where otherwise authorized by the Town.
- b) Do not broadcast loose material.
- c) Hand place carefully to avoid segregation of the mixture. Use lutes and rakes to thoroughly loosen and uniformly distribute the asphalt concrete.
- d) Remove lumps that do not readily break down.
- e) Heat hand tools to keep them free from adhesive buildup of asphalt.
- f) Before rolling, check the surface with a template or straightedge. Remove fat spots, sandy accumulations, high spots, low spots, and any other irregularities, and repair with hot-mix asphalt concrete.

.7 **Compaction**

- a) Following spreading of hot-mix asphalt concrete, compact the mat with rollers.
- b) Each mat of asphalt concrete shall be compacted to a minimum of 98% Marshall Density for all new pavement construction, or as otherwise specified by the Town.
- c) Develop and follow the most suitable pattern of rolling for the area to provide uniform compaction across the mat, including joints and edges.
- d) Compact asphalt concrete until the specified density is obtained.
- e) Perform finish rolling to eliminate equipment marks and to provide a smooth, uniform, and tightly knit finished surface texture.
- f) Final rolling must be complete before the mat temperature drops to 80 °C.
- g) For areas inaccessible by rollers, use an approved vibratory plate compactor or hand tamper to compact the asphalt concrete. A small amount of water may be sprayed on the asphalt surface to aid in compaction using a vibratory plate compactor or hand tamper.

3.5 Joints

.1 **Transverse Joints**

- a) Plan the length of spreading to provide for a minimum 1 m offset of transverse joints in successive lifts and adjacent mats.
- b) Transverse joints shall be straight, have a vertical face painted with tack coat before placement of the adjacent mat, be thoroughly compacted, and shall meet surface tolerances.

.2 **Longitudinal Joints**

- a) Plan mats so that the surface longitudinal joint will be offset by a maximum of 150 mm from the centre of an indicated marking line between traffic lanes. The joint may be located in the centre of a traffic lane only where authorized by the Town.
- b) Plan the width of spreading to provide for a minimum offset of 150 mm, in a dovetail pattern, of longitudinal joints in successive lifts.
- c) Create longitudinal joints while the edge temperature of the first of two adjacent mats is above 80 °C.
- d) Allow a 25 to 50 mm overlap between mats.
- e) Upon placing two adjacent mats, roll a 150 mm wide strip along the adjoining edge. Roll the edge immediately to ensure bonding while the joint temperature is above 80 °C.
- f) For surface lifts arterial, industrial/commercial, and collector roadways where the adjacent mat can not be placed before the joint temperature drops below 80 °C, carefully roll off the edge of a mat. Trim off the rolled asphalt to a width of 150 mm to provide a clean vertical face to the full

depth of the mat. Paint the exposed face with tack coat immediately prior to placing the adjacent mat.

- g) Where the specified longitudinal joint treatment is not performed to the satisfaction of the Town, the area of asphalt paving payment will be subject to a pay factor of 95%. This pay factor shall apply to the payment of asphalt paving for the mat area.
- h) Longitudinal joints shall be thoroughly compacted and meet surface tolerances.

3.6 Tolerances

.1 Smoothness, Grade, and Texture

- a) The maximum variation under a 3 m straightedge shall be as follows:
 - Longitudinal variation (parallel to direction of travel) ± 3 mm; and
 - Transverse variation (transverse to direction of travel) ± 6 mm.
- b) The finished grade elevation shall be within 6 mm of the design grade elevation.
- c) The finished surface shall have a tightly knit texture, free of visible signs of deficiency, including:
 - Segregation;
 - Areas exhibiting excess or insufficient asphalt;
 - Improper matching of joints; and
 - Roller marks, cracking, or tearing.
- d) If any smoothness or grade tolerance is exceeded, or if the surface texture requirements are not met, the Contractor shall grind down and resurface defective areas to the satisfaction of the Town, at the Contractor's sole expense.

.2 Mat Thickness

- a) Where the average core thickness deficiency exceeds 6.0 mm from that specified in Article 3.4.5, that area of asphalt concrete placement will be assessed a pay factor in accordance with the following table:

Thickness Deficiency	Pay Factor
≤ 6.0 mm	100%
7.0 mm	97.0%
8.0 mm	93.7%
9.0 mm	90.0%
10.0 mm	85.5%
11.0 mm	80.5%
12.0 mm	75.0%
13.0 mm	68.0%
> 13.0 mm	Grind and resurface

- b) Where the mat thickness exceeds that specified, the mat may be accepted, with no claim for extra payment, provided that all other requirements are met.
- c) Where the average core thickness deficiency is greater than 13.0 mm, the Contractor shall grind down and resurface defective areas to the satisfaction of the Town, at the Contractor's sole expense.

.3 Density

- a) Where the average core density is below that specified in Article 3.4.7, that area of asphalt concrete placement will be assessed a pay factor in accordance with the following table:

Density	Arterial Roads Pay Factor	Collector and Residential Roads Pay Factor	Density	Arterial Roads Pay Factor	Collector and Residential Roads Pay Factor
100.0%	100.0%	100.0%	96.0%	81.8%	90.9%
99.0%	100.0%	100.0%	95.9%	80.9%	90.9%
98.0%	100.0%	100.0%	95.8%	80.0%	89.1%
97.9%	99.1%	100.0%	95.7%	79.1%	88.2%
97.8%	98.2%	100.0%	95.6%	78.2%	87.3%
97.7%	97.3%	100.0%	95.5%	77.2%	86.3%
97.6%	96.4%	100.0%	95.4%	86.2%	85.3%
97.5%	95.5%	100.0%	95.3%	85.2%	84.3%
97.4%	94.5%	100.0%	95.2%	84.1%	83.2%
97.3%	93.6%	100.0%	95.1%	73.1%	82.2%
97.2%	92.7%	100.0%	95.0%	72.0%	81.1%
97.1%	91.8%	100.0%	94.9%	70.9%	80.0%
97.0%	90.9%	100.0%	94.8%	69.8%	78.9%
96.9%	90.0%	99.1%	94.7%	68.7%	77.8%
96.8%	89.1%	98.2%	94.6%	67.5%	76.6%
96.7%	88.2%	97.3%	94.5%	66.1%	75.2%
96.6%	87.3%	96.4%	94.4%	64.5%	73.6%
96.5%	86.4%	95.5%	94.3%	62.8%	71.9%
96.4%	85.5%	94.5%	94.2%	61.0%	70.1%
96.3%	84.5%	93.6%	94.1%	58.3%	68.2%
96.2%	83.6%	92.7%	94.0%	55.0%	65.3%
96.1%	82.7%	91.8%	< 94.0%	0.0%	0.0%

- b) Where the mat density exceeds that specified, the mat may be accepted, with no claim for extra payment, provided that all other requirements are met.
- c) Where the mat density is less than 94.0%, the Contractor shall grind down and resurface defective areas to the satisfaction of the Town, at the Contractor's sole expense.

3.7 Cleanup

- .1 When the surface has cooled to ambient temperature, and when authorized by the Town, open the area to traffic.
- .2 Remove excess material and clean pavement surfaces affected by the Work within 48 hours following curing of the asphalt concrete.
- .3 Cleanup and restore the affected areas to a condition at least equal to that existing prior to installation, and in accordance with other applicable requirements of the Contract Documents.

- END OF SECTION 34 12 16 -

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the supply and installation of spray-applied epoxy pavement markings on asphalt concrete surfaces.

1.2 Quality Control

- .1 The Contractor is solely responsible for the quality of material, product, equipment, and workmanship which the Contractor provides and for the Work.

2.0 PRODUCTS

2.1 Equipment

- .1 Where the Work is to be carried out on the Town's walking pathway system, equipment must be of an appropriate size to protect the pathway structure, surrounding surfaces, and adjacent appurtenances.
 - a) Only equipment mounted on a half-ton truck-type chassis, or smaller unit, will be accepted.
 - b) A garden tractor-type unit would be best suited to the 3 metre wide pathway system.
 - c) The applicator must be able to ride completely on the pathway and mark the centerline of the path.
 - d) The equipment must be self-propelled and be equipped to apply the marking material according to the manufacturer's recommendations.
- .2 Where the Work is to be carried out on the Town's road network, equipment proposed by the Contractor for use in carrying out the Work shall be subject to the approval of the Town.

2.2 Marking Materials

- .1 Marking materials shall be suitable for asphalt concrete surfaces and shall be available in both white and yellow colours.
- .2 The material, while on the roadway surface and at any natural ambient temperature shall exist as a solid line with cold ductility that permits normal movement with the road surface without chipping or spalling. Propagation of a pavement crack through the lane marking material shall be excluded from this requirement.
- .3 Composition
 - a) The material shall be free from all skins, dirt and foreign objects.
 - b) The compound shall be resistant to the deleterious effects of ultra-violet light. This includes material degradation and discolouration.
 - c) Material shall be non-toxic and not harmful to persons or property.

.4 Colour

- a) Yellow: Conforming to CGSB Colour #505-308 or U.S. Federal Standard 595a Colour chip 33538, 45% minimum when measured with the Gardner Multi-Purpose Reflectometer at 45° - 0° of luminous directional reflectance with a green filter. Colour tolerance shall fall within the limits of U.S. Department of Transport yellow tolerance chart, PR colour #1.
- b) White: Brilliant white, 70% minimum when measured with the Gardner Multi-Purpose Reflectometer at 45° - 0° daylight luminous directional reflectance with a green filter or match U.S. Federal Standard 595a Colour 17886. The white material shall not exceed a yellowness index of 0.15. (AASHTO T250)

.5 Retroreflectivity

- a) The initial reflectance for the in-place marking, measured 7 to 10 days after application, shall have the minimum reflectance values indicated below, as obtained with a Mirolux 30 Retroreflectometer:
Dry/Night: White – 200 mcd/lux/m²
 Yellow – 175 mcd/lux/m²

.6 Retained Retroreflectivity

- a) The reflectance for longitudinal lines, for at least 36 months after placement, shall have the minimum reflectance values indicated below, as obtained with a Mirolux 30 Retroreflectometer.
Dry/Night: White – 75 mcd/lux/m²
 Yellow – 60 mcd/lux/m²
- b) Failure to meet these requirements shall require the Contractor to replace the portion of the material shown to be below these minimum values.

.7 Chemical Resistance

- a) Test samples of 50 mm square should show no signs of degradation after exposure to:
 - i) 0.15% NaCl (24 hr. immersion)
 - ii) 5% CaCl (24 hr. immersion)
 - iii) 1 hour spot test with mineral oil.
 - iv) No deterioration when in direct contact with asphalt cement in asphaltic materials or with sodium chloride or calcium chloride or other de-icing materials.

.8 Bond Strength

- a) The material shall be suitable for application on old or new asphalt. Bond strength shall be sufficient for the material to remain in place for a minimum of three (3) years.

- .9 Skid Resistance
 - a) Minimum vehicle skid resistance of the in place markings shall not be less than 45 based on Portable Skid Resistance Tester, Road Research Laboratory Road Note Number 27, British Standards Institution.

2.3 Premarking Materials

- .1 Premarking materials shall be subject to the approval of the Town.

3.0 EXECUTION

3.1 General

- .1 The Contractor shall assume all costs resulting from the use of patented materials, equipment, devices, or processes used on or incorporated in the Work, agrees to indemnify and save harmless the purchaser and his duly authorized representatives from all suits at law, or action of every nature for or on account of the use of any patented materials, equipment, devices or processes.

3.2 Premarking

- .1 The Contractor is responsible for premarking all work.
- .2 Premarking must be done on a clean, dry pavement surface with premarking paint.
- .3 Unless authorized by the Town, premarking shall be within 100mm accuracy of plan dimensions; notwithstanding this, premarking shall indicate straight lines and smooth curves.
- .4 Premarking shall be reviewed by the Town prior to the installation of the markings.
- .5 Field adjustment of the alignment of the markings from the plans may be accepted, subject to the approval of the Town. Any changes made in the field must be recorded by the Contractor on plans issued by the Town and returned to the Town following completion of the Work.

3.3 Traffic Control and Work Area

- .1 The Contractor shall, at all times, provide warning and passage for all users of the pathway within the area of the Work. The Work shall be carried out as quickly as possible to prevent excessive delay and inconvenience.

3.4 Workmanship

- .1 Install painted pavement markings on a clean, dry pavement surface.
- .2 Spraying will not be permitted during high wind conditions, or other adverse weather conditions.
- .3 Faulty markings must be removed and replaced within 5 working days at the Contractor's sole expense.
- .4 The Contractor shall minimize overspray as much as possible.
- .5 Contractor shall remove any spillage or overspray.

3.5 Types of Markings

- .1 The pavement markings shown on the plans were designed, where applicable, in compliance with the Manual of Uniform Traffic Control Devices for Canada. If conflict arises as to the interpretation between the plans and the Manual of Uniform Traffic Control Devices, precedence shall be given to the plans.

3.6 Rejected Work

- .1 Completely remove and replace rejected work to the limits specified by the Town.
- .2 All rejected products and work shall be adequately removed from the site by the Contractor and corrected to the satisfaction of the Town, at the Contractor's sole expense.

3.7 Cleanup

- .1 Cleanup and restore the affected areas to a condition at least equal to that existing prior to installation.
- .2 Remove and dispose of all debris and excess material at the site at the end of each working day and in a manner acceptable to the Town.
- .3 Maintain the site and areas adjacent to the site in a condition acceptable to the Town.

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the supply of unshrinkable fill (fillcrete) to be used for trench backfill.

1.2 Quality Control

- .1 Refer to Section 01 45 00 - Quality Control.
- .2 Refer to Section 34 01 01 - Concrete for Curbs, Gutters, Walks & Slabs, Article 1.2 - Quality Control
- .3 The Contractor shall provide to the Town a mix design and quality control test results from the supplier.
- .4 The Town shall be notified, and the Contractor shall resubmit to the Town a mix design whenever there is a change in materials, sources or proportions.
- .5 Slump Test: to CSA-A23.2-1C and CSA-A23.2-5C. Slump tests shall be taken between 10% and 90% points of discharge of a load with every strength test and as required by the Town.
- .6 Air Content test; to CSA-A23.2-1C and CSA-A23.2-4C. Air content tests shall be taken between 10% and 90% points of discharge of a load with every strength test and as required by the Town.
- .7 Strength Tests: to CSA-A23.2-3C and CSA-A23.2-9C. Standard strength tests shall be conducted at a frequency of not less than one strength test per day per supplier, or as required by the Town. The result of each compressive strength test shall be within the specified compressive strength range.

1.3 Quality Assurance

- .1 Refer to Section 01 45 00 - Quality Control.

1.4 Related Work

- .1 Refer to Section 34 01 01 - Concrete for Curbs, Gutters, Walks & Slabs.

2.0 PRODUCTS

2.1 Materials

- .1 Portland Cement to CAN/CSA-A3000, A3001-03 of the following types, Type 10, Type 30 or Type 50
- .2 Fine Aggregate to CSA-A23.1, Clause 5.3.2 Table 1
- .3 Water to CAN/CSA-A23.1 Clause 4.2.2, clear free from injurious amounts of oil, acid, alkali, organic matter, sediment or other substances harmful to the mixing and curing of concrete.
- .4 Air-Entraining Admixtures: to ASTM C260.

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for the supply of unshrinkable fill (fillcrete) to be used for trench backfill.

1.2 Quality Control

- .1 Refer to Section 01 45 00 - Quality Control.
- .2 Refer to Section 34 01 01 - Concrete for Curbs, Gutters, Walks & Slabs, Article 1.2 - Quality Control
- .3 The Contractor shall provide to the Town a mix design and quality control test results from the supplier.
- .4 The Town shall be notified, and the Contractor shall resubmit to the Town a mix design whenever there is a change in materials, sources or proportions.
- .5 Slump Test: to CSA-A23.2-1C and CSA-A23.2-5C. Slump tests shall be taken between 10% and 90% points of discharge of a load with every strength test and as required by the Town.
- .6 Air Content test; to CSA-A23.2-1C and CSA-A23.2-4C. Air content tests shall be taken between 10% and 90% points of discharge of a load with every strength test and as required by the Town.
- .7 Strength Tests: to CSA-A23.2-3C and CSA-A23.2-9C. Standard strength tests shall be conducted at a frequency of not less than one strength test per day per supplier, or as required by the Town. The result of each compressive strength test shall be within the specified compressive strength range.

1.3 Quality Assurance

- .1 Refer to Section 01 45 00 - Quality Control.

1.4 Related Work

- .1 Refer to Section 34 01 01 - Concrete for Curbs, Gutters, Walks & Slabs.

2.0 PRODUCTS

2.1 Materials

- .1 Portland Cement to CAN/CSA-A3000, A3001-03 of the following types, Type 10, Type 30 or Type 50
- .2 Fine Aggregate to CSA-A23.1, Clause 5.3.2 Table 1
- .3 Water to CAN/CSA-A23.1 Clause 4.2.2, clear free from injurious amounts of oil, acid, alkali, organic matter, sediment or other substances harmful to the mixing and curing of concrete.
- .4 Air-Entraining Admixtures: to ASTM C260.

1.0 GENERAL

1.1 Description

- .1 This section specifies requirements for landscape grading including subgrade preparation and topsoil placement.

1.2 Applicability to Landscape Contractors and Developers

- .1 Landscape contractors working on projects for the Town shall have current membership of the Landscape Alberta Nursery Trades Association and are required to comply with these standards.
- .2 Developers are responsible for ensuring the employment of a reputable landscape company with current membership of the Landscape Alberta Nursery Trades Association for the fulfillment of all requirements of this specification in terms of the execution of the work and during the maintenance period.

1.3 Definitions

- .1 "Weeds" includes, but is not limited to, dandelions, jimsonweed, quack grass, horsetail, morning glory, rush grass, mustard, lambsquarter, chickweed, crabgrass, Canadian thistle, tansy, ragwort, Bermuda grass, bindweed, bent grass, perennial sorrel, brome grass, red root, pigweed, buckweed, scentless chamomile, toadflax, foxtail, and perennial sow thistle.

1.4 Quality Assurance

- .1 All soils testing and reports shall be by a recognized soils testing laboratory.
- .2 The Town shall be advised of the topsoil source a minimum of 5 days prior to delivery to allow scheduling of inspection by the Town.
- .3 The Contractor shall provide a soils report to the Consultant's Landscape Architect and the Town prior to installation. The soils report shall detail the following:
 - a) Soil texture in accordance with the Canadian System of Texture Classification;
 - b) Soil pH;
 - c) Organic matter content by dry weight;
 - d) Macronutrients status; and
 - e) Conductivity.
- .4 The units in which each characteristic is reported shall correspond to the units specified in the applicable articles of this section. The soils report shall indicate whether the proposed topsoil sample meets the requirements specified. If the sample does not meet the specified requirements, the soils report shall prescribe the amendments, if any, that are necessary to bring the proposed topsoil into compliance with these specifications.

1.5 Disposal

- .1 All materials on site whether stockpiled, stored, or excavated are the property of the Town, and the Town reserves the right to keep any part or all of the material.
- .2 The Contractor shall dispose of all waste materials at sites to be located by the Contractor and approved by the Town.
- .3 Refer to Section 01 52 00 – Construction Facilities for further requirements.

1.6 Related Work

- .1 Section 34 01 00 – Curbs, Gutters, Walks & Slabs.

2.0 PRODUCTS

2.1 Peat Moss

- .1 Peat moss shall be of good horticultural quality, homogeneous, and free of foreign material, lumps, clay, soil, stumps, rocks, quack grass, and noxious weeds. Peat moss shall be pulverized and shall pass through a 37 mm screen. The peat moss shall have a pH between 4.5 and 6.0, conductivity not exceeding 1.5 mS/cm, maximum sulphate of 200 ppm, and no lime present.

2.2 Sand

- .1 Sand for horticultural use: Refer to Section 34 02 00 – Aggregate.

2.3 Crushed Gravel

- .1 Crushed gravel: Refer to Section 34 02 00 – Aggregate.

2.4 Topsoil

- .1 Topsoil shall be loose, friable soil, free from subsoil, slag, clay, stones, lumps, live plant roots, or other foreign materials. Organic matter to be between 4 and 15% by dry weight.
- .2 Topsoil pH to be between 6.0 and 8.0. Use lime or sulphur, as indicated by analysis of topsoil, to bring pH to the required range.
- .3 Topsoil shall be free from weeds and weed seeds, and shall be in a reasonably moist condition.
- .4 Topsoil shall be capable of sustaining vigorous plant growth.
- .5 Where topsoil must be imported, use loam or sandy loam as defined by particle size analysis using the hydrometer method and the mechanical analysis triangle of the Canadian System or Texture Classification. Submit details of imported topsoil to the Town for approval at least 5 days prior to delivery.

2.5 Equipment

- .1 Grading equipment capable of spreading and trimming soil to the specified depth.
- .2 Compacting equipment capable of compacting soil as specified.
- .3 Cultivators capable of scarifying, discing, or harrowing.

- .4 Rollers of suitable size and mass to complete topsoil placement.
- .5 Other equipment as necessary to complete landscape grading as specified.

3.0 EXECUTION

3.1 Preparation of the Site

- .1 Complete backfilling before beginning grading.
- .2 Maintain slopes and adequate drainage during grading.
- .3 Do not allow mixing of topsoil and subsoil material.
- .4 Locate, mark, and protect all utilities and appurtenances (i.e. manholes, catch basins, valves, and hydrants).
- .5 Locate and protect all existing trees and shrubs.

3.2 Inspection of Materials on Site

- .1 Obtain the Town's approval prior to using materials on the Site.

3.3 Grading Procedures

- .1 Excavate to the required subgrade elevation.
- .2 Excavate rock and haul to disposal areas.
- .3 Excavate unsuitable material and haul to disposal areas.
- .4 Grades shall be within 30 mm of design grades.

3.4 Subgrade Preparation

- .1 Scarify soil to a depth of 200 mm, or as otherwise specified or directed by the Town.
- .2 Work the soil with cultivating and mixing equipment until the soil is pulverized into pieces no larger than 25 mm across, inclusive of stones.
- .3 Scarify, shape, and compact the subgrade to a minimum of 95% of the maximum density as determined by the Standard Proctor Compaction Test.
- .4 Leave the surface of the compacted subgrade slightly higher than the required elevation; then trim to the required elevation.
- .5 Total compacted thickness shall be 200 mm.
- .6 Leave the finished surface even and free of depressions, humps, loose debris, and foreign material.
- .7 Do not permit vehicular traffic over the prepared subgrade.

3.5 Topsoil Placement

- .1 The Town shall inspect the subgrade prior to the Contractor proceeding with topsoil replacement.
- .2 Do not place topsoil when subgrade or topsoil is frozen, excessively wet or dry, or in a condition that inhibits proper grading, cultivation, or compaction.

-
- .3 Spread topsoil uniformly over prepared subgrade to achieve a minimum compacted depth of 200 mm for sodded and seeded areas, unless otherwise specified or directed by the Town.
 - .4 Cultivate topsoil to a depth of 200 mm, breaking down lumps. Remove stones larger than 25 mm, weeds, roots, and other foreign material from the Site.
 - .5 Manually spread topsoil around trees and plants to prevent damage by grading and leveling equipment.
 - .6 Float the area until the surface is smooth. Cut smooth and flush all areas adjacent to catch basins.
 - .7 Fine grade to eliminate rough or low areas and to ensure positive drainage.
 - .8 Boulevards – The finished topsoil level shall conform to the adjacent curb and sidewalk elevations and must provide for adequate drainage of sidewalk areas after turf establishment.
 - .9 Buffer Strips – The finished topsoil level shall slope uniformly from the property line towards the back of the sidewalk at not less than 2%.
 - .10 Utility Lots and Walkway – Where sidewalks are present, a swale shall be provided at a distance of at least one meter from either side of the sidewalk. The grade must be sloped away from the sidewalk at a minimum grade of 2%.
 - .11 Median Strips and Traffic Islands – The finished topsoil level shall be even from curb to curb with crowning to accommodate drainage.
 - .12 Compact topsoil with rollers to the satisfaction of the Town.
 - .13 Final topsoil grades for seeded areas shall be flush to finished grades at surface structures (i.e. manholes, sidewalks, driveways, and curbs).
 - .14 Final topsoil grades for sodding shall be 25 mm below finished grades at surface structures and 25 mm below the crown of adjacent turfed areas.
 - .15 When abutting an existing turfed area, cut the existing turf to form a straight, non-jagged joint with the new seeded or sodded area.
 - .16 The Town shall inspect the topsoil preparation prior to the Contractor proceeding with seeding or sodding.

- END OF SECTION 37 91 19 -

1 GENERAL

1.1 Description

- .1 This section specifies requirements for the protection and care of trees during construction.

1.2 Hoarding Requirements

- .1 Trees require protection from damage and compaction during construction activities. Hoarding is an acceptable form of protection for the tree. Hoarding must be set up before the beginning of any construction activity and removed, prior to inspection, but only when construction is complete. No construction activity, including grade changes, surface treatments or excavations of any kind, is permitted within the protected area unless previously approved by the Town of Edson.
- .2 Trees within the boulevards in close proximity (0 -3m) of the construction activity will be hoarded with a standard 'safety orange' snow fence using standard non-preserved wooden posts spaced at maximum intervals of 4m. The limits will be a maximum distance of 30cm back of the reconstructed curb or 0 cm back of existing curb and a maximum distance of 15cm from all sidewalks. Hoarding limits will clearly be marked "No Entry" on a minimum of two sides of the hoarding limits.
- .3 All equipment, soil, building material, and debris must be kept outside the hoarding area. Contractors are responsible for all costs of erecting, maintaining, and removing hoarding material. All landscape repair/reconstruction and tree repair/replacement is an expense involved in the project.
- .4 Prior to construction, contractors will walk through the construction site with Town representatives to identify areas, if any, where construction supplies and equipment can be stored. Only areas identified and approved by the Town will be utilized by the Contractor for construction storage and activities.
- .5 Hoarding must be maintained in a safe and clean condition. In the event that damage occurs to the tree(s) inside the hoarding, or damage occurs to any Town tree as a result of the construction, the Engineer must be notified to arrange an assessment of the damage and take corrective action.
- .6 In any areas within the identified critical root plane of any tree, compaction of the feeder roots can harm trees. If approved by the Town, in areas where construction activities which require workers, equipment or supplies to trod on the critical root plane, $\frac{3}{4}$ " plywood or particleboard must be applied over a 6-8" layer of mulch to distribute compaction in all areas to be trodden. The area of critical root plane will be determined using Table 1.2.6.

Table 1.2.6

Tree Trunk Diameter at Chest Height (1.4m/4.5ft)		Critical Radius of Root Plane	
Inches	Cm (In)	ft	m
2	5	2.5	0.8
4	10	5	1.5
6	15	7.5	2.3
8	20	10	3.0
10	25	12.5	3.8
12	30	15	4.6
14	36	17.5	5.3
16	41	20	6.1
18	46	22.5	6.9
20	51	25	7.6
22	56	27.5	8.4
24	61	30	9.1
26	66	32.5	9.9
28	71	35	10.7
30	76	37.5	11.4
32	81	40	12.2
34	86	42.5	13.0
36	91	45	13.7

1.3 Excavation Near Trees

- .1 Many construction projects require some type of excavation during the project. Most tree roots live within 90 cm (36") of the surface and the majority of these roots are in the top 45 cm (18"). Even minor excavation, such as sod removal, impacts tree roots.
- .2 In all excavations, if a tree root larger than 5 cm or (2") is partially or completely severed, the Town must be notified immediately to arrange an assessment of the damage and take corrective action as determined by a Town of Edson Arborist or Landscape Technician. Immediately after any excavation, prune all exposed tree roots flush with the excavation wall.
- .3 No excavation will be allowed within the tree's root plate as defined by Table 1.2.7 with the exception of the specified 0.3 m back of redesigned curb throughout the duration of the project. Should excavation be required beyond 0.3m back of redesigned curb, the Town shall be notified immediately for assessment and approval.

1.4 Regular maintenance of trees

- .1 During the entire construction period the Contractor shall ensure that trees are consistently and adequately watered providing, at maximum, a period of one week between sequential waterings. During periods of wet weather, the

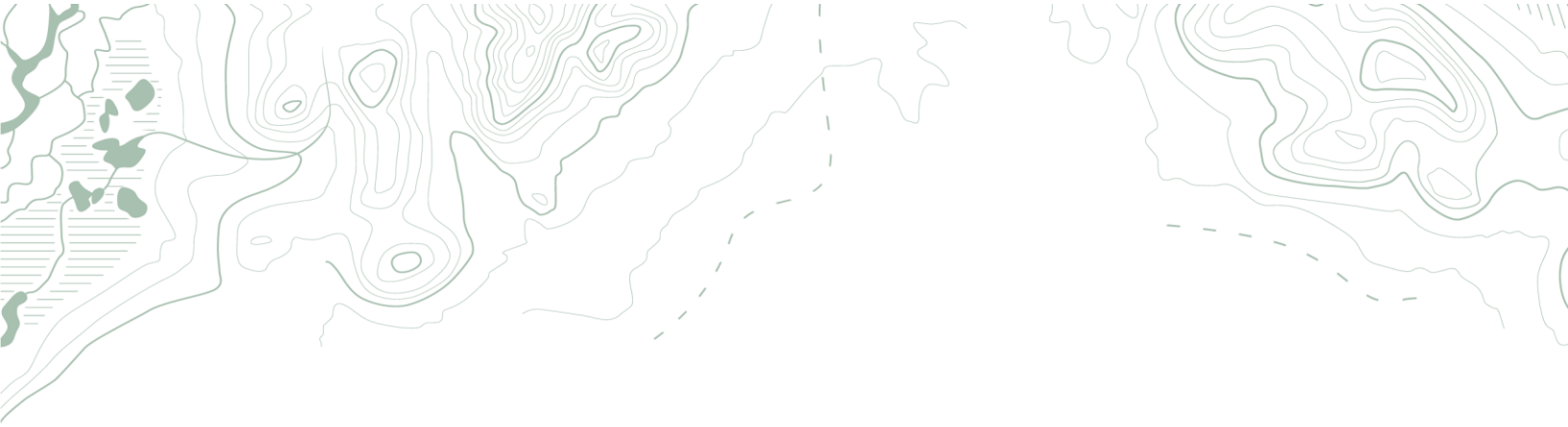
maximum period between the last significant rainfall (10mm/24hr) and the Contractor's watering shall be one week or as advised by a Town Arborist.

EQUITABLE COMPENSATION

1.5 Damage to trees

- .1 Costs related to damage to trees shall include all of or any, but not limited to, labour, material, equipment charges and applicable overhead associated with the asset value or the diminishment of the tree's asset value.
- .2 Damage and/or replacement value trees shall be assessed in accordance to the recommended methodology provided in the most current edition of the Guide for Plant Appraisal authored by the Council of Tree and Landscape Appraisers and published by the International Society of Arboriculture. The assessment shall be conducted by a International Society of Arboriculture Certified Arborist.

- END OF SECTION 37 94 00 -



Town of Edson

9/14/2023 | Revision 0

10th Avenue and 54th Street Sanitary Replacement

Submitted to: Town of Edson
Prepared by McElhanney Ltd.

Geotechnical Assessment Report

Contact
Mike McCormick, M.Eng., P.Eng.
Senior Geotechnical Engineer
780-719-7116
mmccormick@mcelhanney.com

Address
13455 114 Ave NW
Edmonton, AB T5M 2E2



**Your Challenge.
Our Passion.**

Contents

1. Introduction	1
1.1 Scope of Work	1
2. Project and Site Description	2
2.1 Local Geology	2
3. Field Assessment	3
4. Soil and Groundwater Conditions	4
4.1 Road Structure	4
4.2 Silty Clay	4
4.3 High Plastic Clay	4
4.4 Organic Soils	5
4.5 Silt Till	5
4.6 Bedrock	5
4.7 Groundwater	5
4.7.1 Sloughing Soils	6
4.8 Routine Laboratory Testing	6
5. Discussion and Recommendations	7
5.1 Geotechnical Evaluation	7
5.2 Site Preparation	7
5.3 Engineered Fill	8
5.3.1 One Point Proctor Standard	11
5.4 Site Drainage	11
5.5 Groundwater and Surface Water	12
5.6 Temporary Excavations	12
5.7 Utilities	12
5.7.1 Frost Protection	12
5.7.2 Trench Backfill	13
5.8 Pavement Structure	13
5.8.1 Pavement Materials	14
5.8.2 Geotextiles	14
5.8.3 Drainage	15
5.9 Concrete Recommendations	15

6. Design and Construction Review.....	16
7. Limitations.....	17
8. Closure.....	18

Appendices:

Appendix A – Figures

Appendix B – Borehole Logs

Appendix C – Laboratory Test Reports

Appendix D – NBCC 2020 Seismic Hazard Calculations

Appendix E – Statement of Limitations – Geotechnical Services

1. Introduction

McElhanney Ltd. (McElhanney) was retained by the Town of Edson (the Client) to conduct a geotechnical investigation and prepared this report to provide a summary of the geotechnical assessment and recommendations for the proposed replacement of the sanitary sewer lines along 54th Street and 10th Avenue in Edson, AB. The location of the proposed replacement is shown on Figure 01 (Appendix A).

The results of the geotechnical assessment, analysis, as well as recommendations on geotechnical aspects of site development, foundation design and construction are provided in this report.

Authorization to proceed was provided by Clayton Kittlitz, from the Town of Edson, via a signed work authorization form dated May 19, 2023. This report is subject to the Statement of Limitations – Geotechnical Services (Appendix E).

1.1 SCOPE OF WORK

McElhanney has completed this geotechnical assessment in general accordance with the proposal dated May 19, 2023. In conducting the geotechnical assessment and submitting this report, McElhanney has:

- Completed a desktop review of previous studies and existing public data including surficial geology, bedrock, and seismic hazard;
- Performed a field assessment including drilling nine (9) boreholes;
- Completed laboratory testing on select soil samples; and
- Prepared this report summarizing the results of the geotechnical assessment and geotechnical recommendations for the design and construction of the replacement sanitary line.

2. Project and Site Description

The project is located across the Town of Edson, AB, mainly along 54th Street and 10th Avenue. The borehole locations travel north along 54th Street starting at 1st Avenue, before cutting across Griffiths Park towards 6th Avenue. The final 3 borehole locations start near 56th Street and 10th Avenue, and continue east along 10th Avenue for about 250 m.

Based on preliminary conceptual discussion and site plans provided by the Client, the proposed development consists of a replacement of the existing sanitary lines cutting through Edson roughly parallel to the borehole locations.

2.1 LOCAL GEOLOGY

Provincial surficial mapping shows the area to be glaciolacustrine offshore and nearshore sediments of sand, silt, and clay.

The upper soils in the area have been heavily influenced by glacial action over one major glacial advance, which retreated about 12,000 to 14,000 years ago. The area was glaciated by numerous thin ice sheets during the Pleistocene, meaning many of the pre-Pleistocene landforms were only partially modified, leaving behind weathered glacial materials such as alluvium silts and clay and colluvium soils (Alberta Soil Survey, 1972). This part of Yellowhead County is far removed from the mountains further to the west. The glaciation during the Pleistocene carved out the topography seen in Yellowhead County, depositing varying soils as the glaciers retreated across the country.

The Edson region is typified as being covered with a blanket of silt to very silty clay that is typically very weak, wet and sensitive soil, that is not considered an ideal foundation material. The upper soils are prone to frost heaving and ice lens formation, and frost jacking of utilities (piles, power poles, manholes, etc.) is common.

3. Field Assessment

The Geotechnical Field Assessment was carried out on July 6 and 7, 2023 and comprised of drilling nine (9) augured boreholes located at areas of interest along the proposed sanitary line replacement. The boreholes were drilled by Mobile Augers and Research Ltd. of Edmonton, AB using solid stem drilling techniques to depths ranging between 4.3 and 7.3 metres below ground surface (mbgs).

An Alberta One-Call ticket was submitted to determine the presence of underground utilities along the proposed line. McElhanney was also engaged to further identify the location and presence of underground utilities, along with representatives from the Town of Edson. Drilling activities were delayed on July 6 due to unknown utilities being identified at several borehole locations, which were not cleared until July 7.

Following completion of the boreholes, standpipe piezometers were installed and were backfilled with drill cuttings and sealed with bentonite. Flush-mount covers were installed on all nine boreholes, and concrete was poured to secure the well covers at the holes located in roads.

The subsurface conditions encountered in each borehole were observed and recorded by a McElhanney representative. The soils observed in the field were classified in accordance with the Modified Unified Soil Classification System (MUSCS). The borehole locations were surveyed after completion by McElhanney. Figure 02 (Appendix A) shows the borehole locations.

Upon completion of the field program, select soil samples were submitted to Artech Consulting Ltd. of Cranbrook, BC for index testing including moisture contents, Atterberg Limits, hydrometers and grain size analyses. The laboratory testing results are summarized on the borehole logs in Appendix B and the laboratory test reports in Appendix C.

4. Soil and Groundwater Conditions

A summary of the subsurface conditions observed at the borehole locations is provided below. The detailed borehole logs are included in Appendix B. Note that subsurface conditions across the project location may vary in areas not specially investigated. All depths provided in this section are referenced from the ground surface at the time of field investigation, while all elevations are to Mean Sea Level (MSL).

4.1 ROAD STRUCTURE

Gravel road crush fill was encountered under a thin (approximately 0.2 m) layer of asphalt in seven of the nine boreholes. The gravel fill had varying thickness ranging from 0.3 to 1.6 m (El. 909.2 to 919.8 m).

Boreholes 23-05 and 23-06 were located in a parking lot and grass field, respectively. Both did not contain the gravel road crush fill.

The gravel fill was standard 20 mm road crush. It was compact and damp. The fill was generally described as brown in appearance.

The gravel fill thickness is expected to be variable and may be deeper or shallower in some locations not explicitly examined during the investigation.

4.2 SILTY CLAY

Native silty clay was encountered under the gravel road crush fill in all seven boreholes that had the road crush and below the surface in the other two boreholes. It was found at depths ranging from 0.9 to 5.4 mbgs (El. 919.1 to 905.6 m).

The silty clay consisted of varying amounts of silt and clay and trace sand. The layer was described as medium plastic and brown to grey.

The density of the silty clay was consistent across the boreholes. SPT N values ranged from 7 to 10 blows per 300 mm, with an average of 8.

The moisture contents in the silty clay generally ranged from 18 to 26 percent, indicating the layer was damp to moist.

4.3 HIGH PLASTIC CLAY

High plastic clay was encountered in Boreholes 23-01, 23-02, 23-03, 23-06 and 23-08 below the silty clay. The clay was encountered at depths ranging from 2.3 to 7.3 mbgs (Elev. 915.3 to 903.7 m).

The high plastic clay was silty or contained some silt. An Atterberg Limit analysis in the layer reported a liquid limit of 55 and a plastic limit of 20, for a plasticity index of 35. It was grey or brown.

The high plastic clay was generally firm in density. SPT N values ranged from 5 to 10 blows per 300 mm, with an average of 6.

The moisture contents ranged from 26 to 39 percent and was generally described as moist in the field.

4.4 ORGANIC SOILS

Organic soils in the form of organic clay and organic peat were encountered in Boreholes 23-05 and 23-06. Organic clay was encountered directly under the asphalt layer in Borehole 23-05 from 0.2 to 0.9 mbgs (Elev. 910.8 to 910.1 m). Organic peat was encountered in both Boreholes 23-05 and 23-06 at depths ranging from 0.9 to 1.5 mbgs (Elev. 911.0 to 909.5 m).

The organic clay was silty and contained trace gravel and sand. Frequent organics including large chunks of decomposing wood were present. It was firm and damp and grey-blue in colour.

The organic peat was full of organic material and had a strong organic odour. It was very loose, damp, and dark brown in colour.

4.5 SILT TILL

Native glacial silt till was encountered in Boreholes 23-07 and 23-08, exclusively along 10th Avenue. It was found at depths ranging from 2.7 to 5.4 mbgs (El. 917.3 to 912.6 m).

The silt till consisted of sandy silt, with some clay, trace cobbles, and trace gravel. The layer was described as grey or brown in colour.

The density of the till was generally compact, with an SPT N value of 14 blows per 450 mm.

The moisture contents in the till generally ranged from 18 to 20 percent, indicating the layer was damp.

4.6 BEDROCK

Auger refusal was not encountered in any boreholes. From McElhanney's understanding, bedrock is not located within the upper 70 m of ground surface in this area.

4.7 GROUNDWATER

Groundwater was observed after drilling in Boreholes 23-02, 23-03, 23-04, 23-05 and 23-06 at depths ranging from 2.4 to 5.0 mbgs (El. 906.6 to 906.3 m), respectively. Groundwater measurements were taken again on July 24, 2023 in Boreholes 23-01, 23-02, 23-03, 23-05, 23-06 and 23-09.

Minor sloughing and seepage conditions were observed during drilling.

Groundwater elevations are expected to fluctuate on a seasonal basis and will be highest after periods of heavy precipitation and snowmelt.

Table 4.7: Summary of Groundwater Measurements

Borehole	Total Piezo Depth (m)	Surface Elev. (m)	Groundwater Measurements			
			July 6/7, 2023		July 24, 2023	
			Depth (m)	Elev. (m)	Depth (m)	Elev. (m)
BH23-01	5.3	908.350	Not encountered	-	1.5	906.850
BH23-02	7.3	909.615	4.8	904.815	2.0	907.615
BH23-03	5.3	908.884	3.6	905.284	1.4	907.484
BH23-04	5.2	910.000	2.4	907.600	-	-
BH23-05	5.3	911.334	5.0	906.334	2.0	909.334
BH23-06	5.3	910.519	3.0	907.519	1.3	909.219
BH23-09	4.3	917.108	Not encountered	-	1.75	915.358

4.7.1 Sloughing Soils

Minor sloughing soils were encountered in the boreholes. Generally, the soil began to slough into the hole around 3 mbgs while in the soft high plastic clay.

4.8 ROUTINE LABORATORY TESTING

The laboratory test results are summarized below in Table 4.8.

Table 4.8: Summary of Laboratory Test Results

Borehole No.	Depth (m)	Grain Size Distribution (%)				Plasticity (%)			Soil Type*
		Clay	Silt	Sand	Gravel	LL	PL	PI	
BH23-01	3.3	-	-	-	-	39	19	20	CL
BH23-03	4.8	-	-	-	-	55	20	35	CH
BH23-04	3.2	-	-	-	-	38	19	19	CL
BH23-04	2.5	37.5	53.2	7.9	1.3	-	-	-	-
BH23-07	4.0	-	-	-	-	36	15	21	CL
BH23-08	1.3	51.4	47.9	0.7	0.0	-	-	-	-
BH23-08	2.5	-	-	-	-	51	19	32	CL-CH
BH23-08	4.8	18.1	50.0	30.7	1.2	-	-	-	-

*Modified Unified Soil Classification System (MUSCS)

5. Discussion and Recommendations

5.1 GEOTECHNICAL EVALUATION

The geotechnical recommendations provided in this report are based on the understanding of the proposed preliminary development plan provided by the client and the Site conditions as described in preceding sections. It is recommended that once the development plan/design has been completed, McElhanney should be consulted to provide input into the detailed design.

Based on our project understanding and the findings of this geotechnical assessment, the Site soil conditions appear to be suitable for a conventional open-cut sewer installation method with the risk that squeezing of the trench sidewalls and sloughing may require flatter side slopes that would necessitate using a trench box or wider excavation. The following sections provide discussions and recommendations as input for planning and design based on the current project understanding.

The main geotechnical issues are:

1. The presence of high plastic clays and silts found as high as 2.3 mbgs (Elev. 915.3 m). This clay has low bearing strength and has a high susceptibility for swelling and settlement. This clay will provide a low level of support for structures and will be susceptible to sloughing failures during excavation.
2. The groundwater table was found to be as shallow as 1.3 mbgs. We anticipate that this level will fluctuate throughout the year. This will need to be considered during design planning and monitored during construction. The contractor should be aware that dewatering will almost certainly be required. A thick gravel bedding mat may be required to allow dewatering of the trench and to provide workers dry conditions to install the line.
3. Roads and parking areas will be constructed over a combination of engineered fill and stripped native subgrades. The main risk is that localized settlement will cause pavement distress or failure, that would result in long-term maintenance issues and costs. Differential settlement of new trench fill and older existing roadways is a significant concern. The use of proof rolling, inspection and a design incorporating geogrid to bridge over small weak areas is recommended to minimize risks. Further seasonal movement due to expansion due to freezing and ice lens formation is expected and is not likely to be uniform. Delaying final pavement for one to two years after line installation will allow a portion of the settlement to take place prior to final paving.

The following sections provide discussion and recommendations as input for planning and design based on the current project understanding.

5.2 SITE PREPARATION

The following recommendations are provided for subgrade preparation of grade-supported load-bearing structures:

- Remove any existing vegetation, organic soil, loose fill soils/materials and other deleterious materials underlying all structures and paved areas. Due to the undocumented nature of the existing fill and the unknown loading history, undesirable fill or debris should be expected to be encountered during construction that will necessitate consultation with McElhanney and possible revisions to these recommendations and construction procedures. An observational approach should be adopted whereby the contractor and engineering team work collaboratively to identify risks and design site-specific remedial approaches.
- All prepared subgrades should be inspected in the field by the Geotechnical Engineer of Record or their representative to confirm that the subgrade conditions are consistent with the design conditions assumed in this report. The exposed should be inspected by the Geotechnical Engineer or their representative to identify any loose/soft areas before placement of any new Engineered Fill or piping.
- Soft, loose, wet, and/or otherwise unsuitable subgrade surfaces can be repaired by sub-excavation and replaced with Engineered Fill (Section 5.3). To maintain subgrade uniformity, soft area repair should be carried out using gravel of a similar characteristics to the in-situ subgrade soils. Due to the soft nature of the clay soils at the anticipated pipe elevation, a relatively thick bedding layer may be required to bridge the softer soils. Geotextile should be used to wrap the bedding and structural envelope to minimize the migration of fines into the gravel fill.
- Subject to field review at the time of construction, any sub-excavations within the proposed development limits should be backfilled to design subgrade elevation with approved fill material in accordance with the material selection, placement and compaction specifications for Engineered Fill (Section 5.3).

General site grading fills outside of paved areas (i.e. areas that will remain grassed parkland) should consist of approved common fill comprising clean inorganic granular materials from local or imported sources. Subject to surface grading, drainage and settlement tolerances required for site grading design, common fill materials may be placed in uniform layers not exceeding 200 mm compacted thickness and compacted as per Section 5.3.

In general, poor performance of trench backfill during rehabilitation work can be expected if the trench backfill is dried out relative to the remaining native soils. Better final trench performance with respect to settlement and heaving is typically found where the excavated soil is replaced back at the same moisture content that it was removed. Ideally, adopting a uniform backfill design, whereby all soil across the road right of way is excavated and then replaced as a uniform fill envelope (essentially property line to property line) will provide a more uniform performance.

5.3 ENGINEERED FILL

Any fill soil placed to support pipe or road structures must be Engineered Fill consisting of well-graded sand and gravel with less than 5% fines (material passing the 0.075 mm sieve) and a maximum aggregate size not exceeding 75 mm. Any granular materials proposed for use as Engineered Fill should

be tested and approved by the Geotechnical Engineer before placement. Table 5.3.1 provides recommended gradations for granular base, granular sub-base (well graded gravel) and drain rock materials. The Well Graded Gravel is considered an approved gradation for Engineered Fill.

Table 5.3.1 Recommended Granular Fill Gradations

SIEVE SIZE (mm)	CRUSHED GRANULAR BASE COURSE (GBC) 20 MM CRUSH	WELL GRADED GRAVEL / GRANULAR SUB-BASE (GSB) 40 MM CRUSH	FRACTURED DRAIN ROCK
	AB. TRANS DES. 2	AB. TRANS DES. 2	
80			
50			
40		100	
25		70 – 94	
20	100		100
16	84 – 94	55 – 85	0 – 100
10	63 – 86	44 – 74	0 – 5
5	40 – 67	32 – 62	-
1.25	20 – 43	17 – 43	-
0.630	14 – 34	12 – 34	
0.315	9 – 26	8 – 26	-
0.160	5 – 18	5 – 18	
0.080	2 – 10	0 – 10	-

AB. Trans Des 2: Alberta Transportation, Designation 2 (Base Course Aggregate); Standard Specifications for Highway Construction. Ed. 16, 2019.

Yellowhead County defers to Alberta Transportation Specifications. Yellowhead County Design Guidelines and Construction Standards. January 2007.

Regardless of specification used, it is preferred that there be less than 5% fines (<0.080 mm).

Size #5 Concrete Aggregate. ASTM C33.

Table 5.3.2 provides recommended gradations for Type 1 and Type 3 pipe bedding.

Table 5.3.2 Recommended Gradation for Pipe Bedding (Type 1 and 3)

Sieve Size (mm)	Type 1 (Standard)*	Type 3 (Drain Rock)
	Percent Passing	
50		100
38		90 – 100
25		20 – 60
19		0 – 15
12.5	100	
9.5		0 – 15
5.0	90 – 100	
1.25	55 – 85	
0.315	10 – 35	
0.080	0 – 5	

* Yellowhead County Design Guidelines and Construction Standards, 2007

Fill required to bring the Site up to grade, should be well graded select sand or gravel. The existing fill soils (trench spoil) are considered marginally suitable as backfill. Selective use of the existing fill may be considered but in some areas this could be more costly and time consuming than importing fill. Deleterious fill such as the peat and organic clay found during the investigation in some areas must not be used as engineered fill and should be off-hauled from the site. Under no circumstances must this deleterious material be used as trench backfill or below pavement structures.

Table 5.3.3 Recommended Compaction Levels

Fill Location	Recommended Minimum Compaction Level (% of SPMDD*)
Building Areas	
New fill greater than 0.6 m thickness (including trenches)	100%
New fill less than 0.6 m thick (including trenches)	98%
Engineered fill below footings	100%
Under structural concrete slabs	95%
Other Development Areas	
Under paved or concrete areas, access roads, parking	98%
Exterior building area outside of pavement structures	95%

* SPMDD – Standard Proctor Maximum Dry Density

The lift thicknesses should be governed by the ability of the selected compaction equipment to uniformly achieve the recommended density. However, it is generally recommended to use lifts with a maximum compacted thickness of 200 mm for granular fill. Uniformity is of most importance. Granular fill is best compacted with large smooth drum vibratory rollers. In areas which require higher compaction, it is recommended that granular fill be placed at moisture contents 0 to 2 percent below the Optimum Moisture Content (OMC). This will help reduce compactive effort and potential risk of subgrade disturbance needed to achieve maximum density. Fill placement and compaction during the winter months is challenging due to the difficulty in moisture conditioning fill soils and obtaining high compaction levels. Materials and methodology should be reviewed prior to construction if cold weather compaction of fills is proposed. High compaction levels can only be achieved using fill soils that are unfrozen. Structural fills or engineered fills that support structures/features that are sensitive to movement, must not be placed on soil that is in a frozen state or has recently been in a frozen state.

5.3.1 One Point Proctor Standard

The moisture content of the existing native soils and fill was generally well above the Plastic Limit and was considered saturated. Drying this material will be very difficult due to the congested nature of road right of ways and limited to no areas available to dry the soil. As such, it will be nearly impossible to meet a typical Standard Proctor compaction standard with the existing clay and silt materials. In this case, the adoption of using a One Point Proctor density standard or control strips is the typical practice.

Clay and silt backfill placement could be compacted to 100% of One Point Proctor density for this project as an alternative compaction standard.

5.4 SITE DRAINAGE

Positive surface drainage should be maintained away from the trench areas in all directions, considering existing infrastructure adjacent to the proposed development. Surface drainage of all developed areas

should be maintained with a recommended minimum 2% cross-slope. The Site grading must be designed such that water cannot pond on or beside parking areas, roadways or buildings. Infiltration of surface water should be minimized along the trench alignment to reduce settlement and frost heaving.

5.5 GROUNDWATER AND SURFACE WATER

A shallow groundwater table of as high as 1.3 mbgs was encountered at the Site and groundwater seepage into open trenches must be expected. Where groundwater seepage is encountered during construction, the groundwater should not be permitted to collect in the bottom of the excavations during construction and a contingency plan should be made to pump out or drain excavations with sump pumps and to divert water away from the excavation. If significant groundwater seepage is encountered the geotechnical engineer should be contacted to review.

Installation of a thick (tentatively 400 mm) washed rock bedding layer will probably be required to control seepage and allow the work to progress in the dry. The washed rock will easily compact with minimal effort and will provide adequate pipe support.

5.6 TEMPORARY EXCAVATIONS

Excavations will be required for foundations and underground utility installations. All excavation work must comply with the requirements of the Alberta Occupational Health and Safety Act (OHS Act, 2023), OHS Regulation (2023) and OHS Code (2023), or the most recent update at the time of construction. The OHS Code contains the technical requirements that support the Act and Regulation.

Specifically with reference to Section 442 the OHS Code, the soils on this site would be classified as "soft, sandy or loose". The near surface high plastic clay is known to contain slickensides and fissures which further reduce the stability of open cut faces. From Section 451 of the OHS Code, the soils must be cut at an angle of not less than 45 degrees measured from the vertical or 1 (V) to 1 (H), extending from toe to crest. However, experience with the soils in Edson suggests that flatter excavation slopes in the order of 1.5 (V) to 1 (H) or flatter will likely be required.

If space does not permit the slopes to be cut back, some form of temporary shoring must be installed to protect workers in the trench. All temporary surcharge loads should be kept back from the excavated faces a distance of at least one times the depth of the excavation. All vehicles delivering materials to the Site should be kept back from excavated faces at least 2.0 m or one times the excavation depth, whichever is greater.

5.7 UTILITIES

5.7.1 Frost Protection

Services and utilities at the Site should be installed with a minimum depth of cover of 3.0 m to the top of the service piping based on the requirements outlined in the Yellowhead County Design Guidelines and Construction Standards, 2007. If shallow burial depths are proposed, engineered insulation solutions will

be required to prevent frost penetration. Insulation design options and review can be provided upon request.

5.7.2 Trench Backfill

The trench backfill should be placed in maximum vertical lifts of 200 mm compacted thickness (or less to suit available compaction equipment) and compacted uniformly to meet the specifications presented in this report. The pipe bedding should be compatible with the size, type and class of pipe and the requirements of pipe provider. In the absence of special provisions and specifications, for preliminary design, it is recommended to use a minimum thickness of 100 mm of granular pipe bedding material below the pipe. The bedding should also extend to a width sufficient to permit compaction with vibratory plate compactors and should extend vertically a minimum of 300 mm above the top of the pipe. The granular bedding and structural envelope should meet the specifications of the civil design and the pipe manufacture’s recommendations.

For utilities placed above the water table (about 1.4 mbgs or higher), the Type 1 Pipe Bedding (Section 5.3) should be used. For any deeper utility installations or where significant groundwater seepage is encountered, the Type 3 bedding should be used.

Backfilling above pipe bedding zone should be performed based on recommendations provided for Engineered Fill compaction depending on the area type.

5.8 PAVEMENT STRUCTURE

Pavement structure recommendations are based on the silty and clayey materials that were encountered in the boreholes and the anticipated traffic loading of primarily passenger and commercial vehicle traffic.

The subgrade for roads and the parking lot should be prepared as described in Section 5.1. Note that additional pavement structure and additional construction considerations may be required in case soft soils with a California Bearing Ratio (CBR) of less than 3.0 are encountered during construction. Base coarse aggregate and granular sub-base should meet specifications provided in Table 5.3.1 (Section 5.3). The asphalt should conform to Alberta Transportation requirements. Table 5.8 presents pavement structure recommendations. Material required to bring subgrade areas to design elevations should be Engineered Fill, GSB or an approved Common Fill alternative.

Table 5.8 Pavement Structure Recommendations (for subgrade CBR >3)

Pavement Structure	Asphalt Concrete (mm)	Crushed Granular Base Course (GBC) (mm)	Granular Sub-Base (GSB) (mm)	Total Structure (mm)
Road	75	150	300	525
Parking Lot	50	150	300	500

A medium weight geotextile (Section 5.8.2) must be placed between the clay/silt subgrade and the granular sub-base layers. Geogrid reinforcement may also be used to improve roadway performance.

5.8.1 Pavement Materials

The performance of the proposed pavement sections will be, in part, dependent on achieving an adequate level of compaction in subgrade and pavement materials. The recommended levels of compaction for the granular fills are outlined in Section **Error! Reference source not found..** The asphalt concrete should be compacted to a minimum of 97 percent of Marshall Density based on a 50-blow laboratory Marshall Test. It is recommended to use pavement materials conforming to the following specifications.

Table 5.8.1 Asphalt Concrete

Marshall Parameter	Specification
Blows per Face	50
Stability (kN minimum)	8.0
Flow (0.25 mm units)	8.0 – 16.0
Air Voids (percent) – design	3.5 ± 0.3
VMA (percent)	14.5 – 15.5

Aggregate materials for asphalt and granular base course should be composed of sound, hard, durable particles free from organics and other foreign material. It is recommended to use aggregates conforming to the Alberta Transportation specifications.

The material specifications included both gradation and other performance indicators including requirements for CBR, LA Abrasion, and Plasticity Index on fines. Based on availability of local materials at the time of tendering or construction, alternate materials could be considered upon review by the geotechnical engineer.

5.8.2 Geotextiles

The use of a geotextile filter fabric as a separation barrier between the pavement gravel and the subgrade is recommended across all backfill areas that will support a pavement structure. The suggested geotextile specification is:

Table 5.8.2 Class 2* Non-Woven Filter Cloth Specification

Parameter		Unit	ASTM Test	Specification
Strength	Grab Tensile Strength (min.)	N	D4632	650
	Grab Elongation at Failure (min.)	%	D4632	50
	Static (CBR) Puncture (min.)	N	D6241	1600
	Trapezoidal Tear (min.)	N	D4533	250
Hydraulic	Apparent Opening Size (max.)	mm	D4751	0.20
	Permittivity (min.)	per sec.	D4491	1.5
	Water Flow Rate	L/min/m ²	D4491	6120
Endurance	UV Resistance	% @ 500 hrs.	D4355	70

*Medium Weight Non-Woven Filter Cloth (Layfield LP6, LP7; Propex 601, 701; CCIS-601C)

The addition of a geotextile at the subgrade surface on this type of subgrade material would not reduce the granular thickness requirements significantly but is intended to ensure that the gravel structure does not migrate into or be lost into the existing site soils, thereby maintaining the full thickness of the gravel base and sub-base.

5.8.3 Drainage

All pavement area surface and subgrade should be sloped and graded to effectively remove all surface and subsurface water as rapidly as possible. It is recommended to provide adequate surface drainage with cross slope crowns of at least 2 percent on regularly maintained gravel surfaces. Yard and parking areas should be sloped and graded to effectively remove all surface water as rapidly as possible. To minimize the occurrence of surface water ponding, surface grades of at least 2 percent are recommended. Allowing water to pond on the surface will lead to infiltration of the water into the subgrade which could result in weakening of the subgrade soils. For large parking areas, additional grade may be needed to shed water from the surface.

5.9 CONCRETE RECOMMENDATIONS

Water soluble sulphate concentrations are typically low in this area. As per CSA A23.1-M14, a General Use (GU) hydraulic cement is recommended with a minimum 28-day compressive strength of 28 MPa and a water cement ratio of 0.5. General Use Hydraulic (Type GU) cement may be used for all concrete in contact with soil at the Site.

6. Design and Construction Review

The recommendations provided are based on assumptions of building layout, including the incorporation of below grade areas (basements). Once the final design has been prepared, it is recommended that the design be reviewed by McElhanney to verify that the geotechnical recommendations were incorporated and what further geotechnical assessment may be required for final design and construction.

Siting of proposed structures must be reviewed by the Geotechnical Engineer to ensure conformance with our slope setback recommendations. It is strongly recommended that we be provided with the architectural site plan and structural design for review at the concept stage of design.

To issue applicable Building Code Schedules and/or construction QA/QC letters, all backfill and Engineered Fill must be reviewed by the geotechnical engineer as specified in this report. McElhanney can provide these construction reviews, as well as material testing services during construction if requested.

7. Limitations

This report has been prepared for the exclusive use of TOWN OF EDSON. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **McElhanney Ltd.** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. No other warranty, expressed or implied, is made. The Statement of Limitations – Geotechnical Services that govern the use of this report and our geotechnical consulting services on this project are attached (Appendix E) and are to be considered part of this report.

The recommendations provided in this report or in other correspondence related to this project are based on the information available on the proposed development, observations made at the subject site, interpretation of the data obtained from subsurface investigations, and our experience with similar soils and subsurface conditions. As the soils investigation represents a very small statistical sampling of the subsurface conditions, subsurface conditions could vary significantly from those described in this report, and in such instances, adjustments to design and construction of the proposed structures might be necessary, and McElhanney must be notified immediately when site conditions differ from those described in this report.

8. Closure

We trust that this information is sufficient for your present needs. Should you have any questions or require additional information, please do not hesitate to contact the author of this report.

Sincerely,
McElhanney Ltd.

Prepared By:



Roan McMillan, E.I.T.
Junior Geotechnical Engineer
rmcmillan@mcelhanney.com
778-994-8415

Michael McCormick, M.Eng., P.Eng.
Senior Geotechnical Engineer
mmccormick@mcelhanney.com
780-719-1776

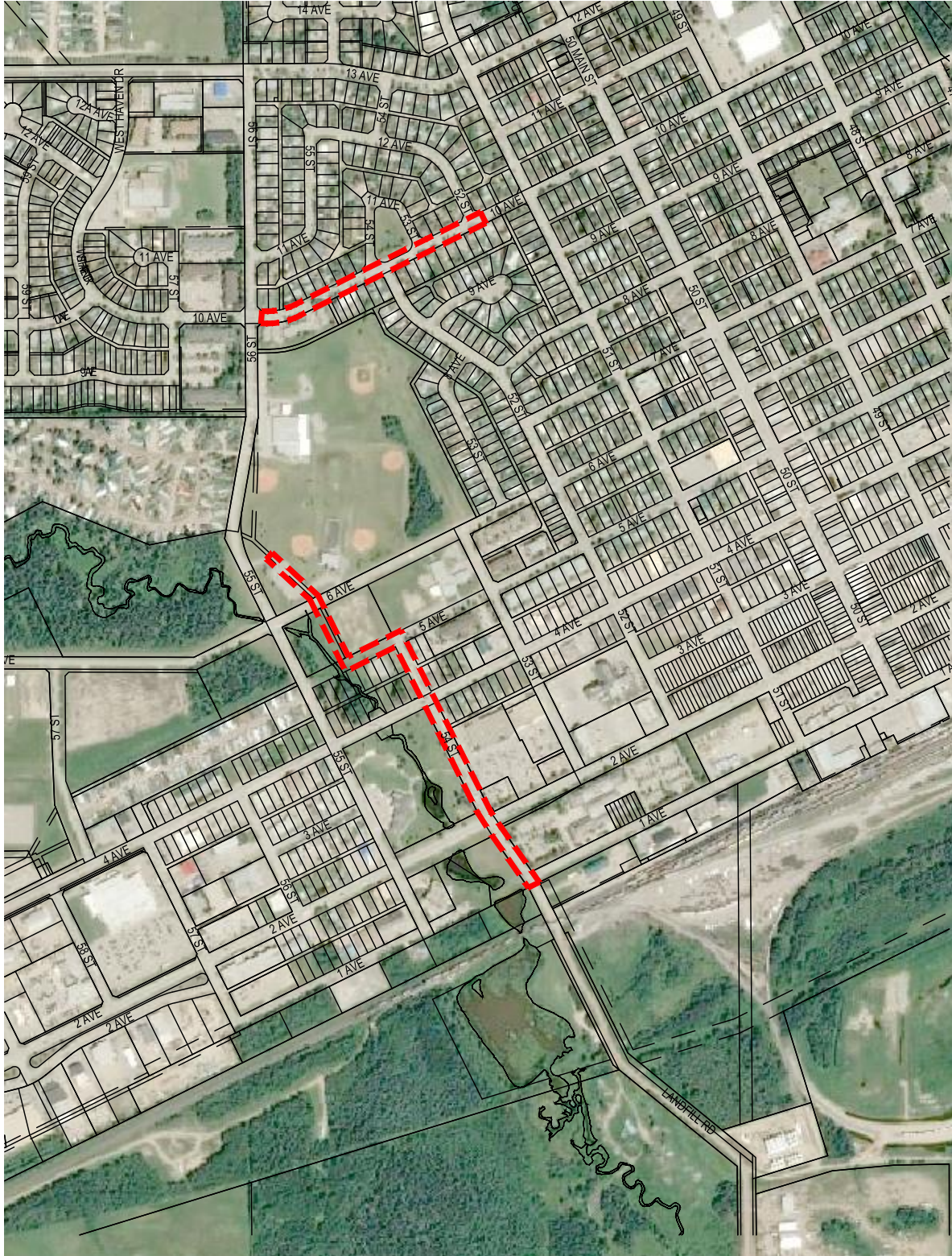
Reviewed by/Responsible Member:
APEGA Permit to Practice No. P-6383



ID#156961

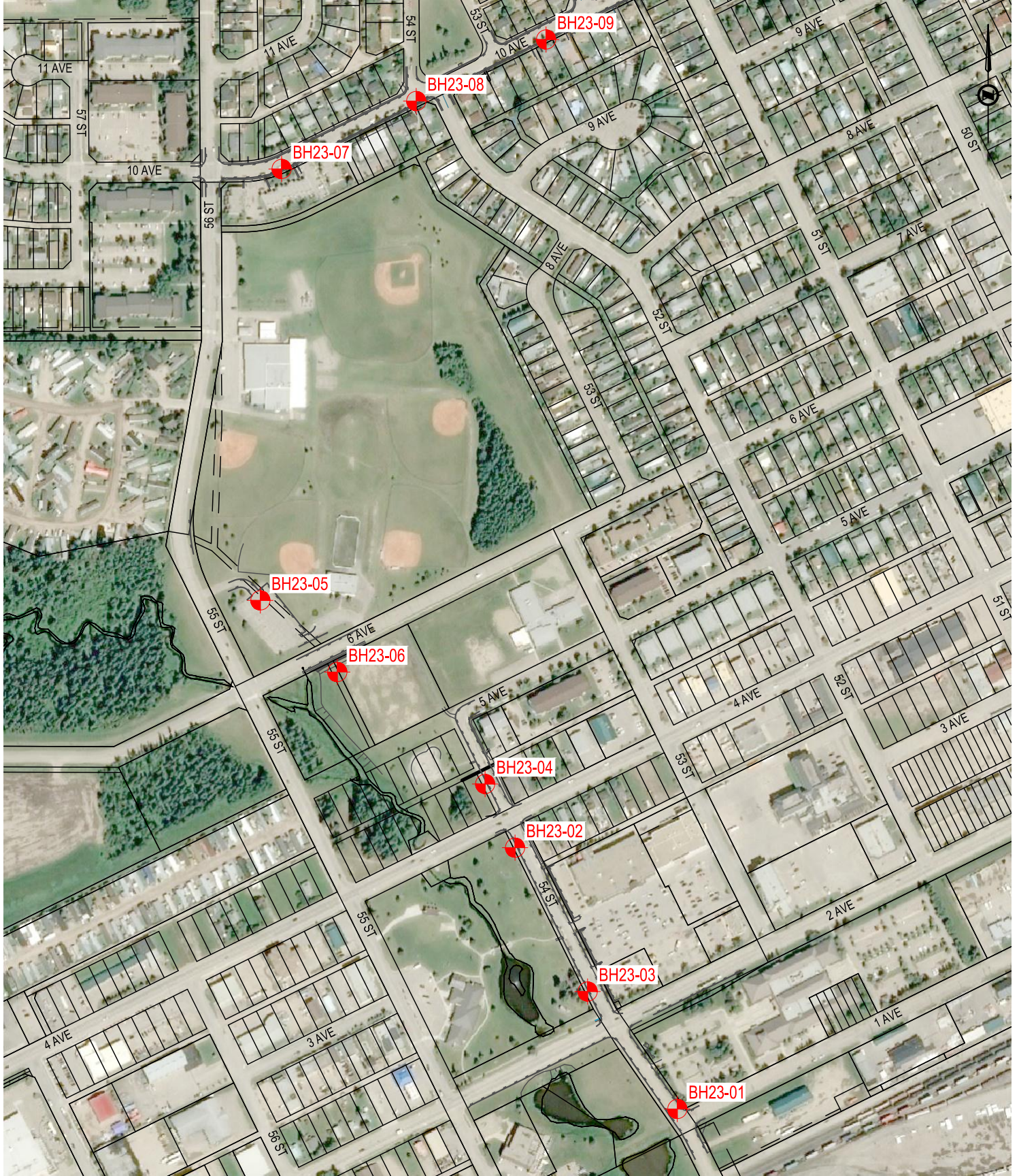
Ryan Gibbard, P.Eng.
Senior Geotechnical Engineer

APPENDIX A – FIGURES



DATE: 2023-08-14, 10:22 FILE: X:\3231\Projects\5231-11020-01 10th Ave & 6th Ave Sanitary Upgrade\10.0 DRAWINGS\10.3.2 Sketches\11020-00-Figure 01 - Site Location.dwg





DATE: 2023-08-14 09:03 FILE: X:\2023\Projects\5231-11020-00\10m Ave & 54 St Sanitary Upgrade\10.0 DRAWINGS\03.0 Engineering\03.2 Sketches\11020-00-Figure 02 - Borehole Locations.dwg

APPENDIX B – BOREHOLE LOGS

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-01
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5936715.90 537137.75	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 908.35 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	<ul style="list-style-type: none"> ▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%) 				REMARKS
							20	40	60	80	
	908.15		ASPHALT								
	908		GRAVEL FILL: 20mm road crush, compact, damp, brown								
1											
	907										
2			CLAY: silty, soft, medium plastic, damp, brown	AU S01							
	906		- firm	SPT S02	100	3-3-5 (8)					
3			- damp to moist		100						
	905			AU S03							
	904.65		CLAY: some silt, high plastic, firm, moist, grey	SPT S04	100	2-2-3 (5)					
4				AU S05							
	903		Terminated at 5.40 m. Target depth reached.								WI = 39 Wp = 19 Ip = 20
5											
	902										
6											
	901										
7											
	900										
8											
	899										




McElhanney

LOGGED BY: RM	START DATE: July 06, 2023
REVIEWED BY: MM	COMPLETION DATE: July 06, 2023
COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-02
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5936969.77 536979.96	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 909.62 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	<ul style="list-style-type: none"> ▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%) 				REMARKS
							20	40	60	80	
	909.42		ASPHALT								
	909.00		GRAVEL FILL: 20mm road crush, compact, damp, brown								
1	908.72		CLAY: silty, soft, medium plastic, damp, brown	AU S01							
2											
3	907.12		CLAY: some silt, high plastic, firm, damp to moist, grey	SPT S02	90 90	4-4-4 (8)					
4				AU S03							
5				SPT S04	90 90	3-2-3 (5)					
6			- moist	AU S05							
7			- very soft to soft	SPT S06	90 90	3-2-3 (5)					
8			- moist to wet	AU S07							
9				SPT S08	80 80	2-3-3 (6)					
	902.32		Terminated at 7.30 m. Target depth reached.								

 McElhanney	LOGGED BY: RM	START DATE: July 07, 2023
	REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
	COMPLETION DEPTH: 7.30 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-03
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5936830.03 537050.58	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 908.79 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	<ul style="list-style-type: none"> ▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%) 				REMARKS
							20	40	60	80	
	908.59		ASPHALT								
	908.59		GRAVEL FILL: 20mm road crush, compact, damp, brown								
1	907.59		CLAY: silty, soft to firm, medium plastic, damp, brown-grey	AU S01							
2	906.49		CLAY: some silt, high plastic, firm, damp to moist, grey	SPT S02	90 90	2-5-4 (9)					
3				AU S03							
4			- moist	SPT S04	90 90	2-3-4 (7)					
5	903.39			AU S05							WI = 55 Wp = 20 Ip = 35
			Terminated at 5.40 m. Target depth reached.								
6											
7											
8											
9											
	899										



McElhanney

LOGGED BY: RM	START DATE: July 07, 2023
REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
COMPLETION DEPTH: 5.40 m	Sheet 1 of 1


CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-04
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937031.62 536950.94	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 909.62 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	<ul style="list-style-type: none"> ▲ N Value ● Moisture Content (%) I Plastic/Liquid Limit (%) □ Fines Content (%) 				REMARKS
							20	40	60	80	
	909.42		ASPHALT								
	909.12		GRAVEL FILL: 20mm road crush, compact, damp, brown								
1	909.12		SAND: silty, trace clay, loose, damp, light brown	AU S01							
	908.52		CLAY: silty, trace sand, soft to firm, medium plastic, damp to moist, brown-grey	SPT S02	90 90	4-4-5 (9)					
2	907.52		SILT: clayey, trace gravel, trace sand, soft, moist to wet, grey	AU S03							
	907.52			SPT S04	90 90	2-2-2 (4)					Gravel: 1.3% Sand: 7.9% Silt: 53.2% Clay: 37.5%
4			- 3.8 to 4.1m wet loose sand layer	AU S05							Wl = 38 Wp = 19 Ip = 19
	905.12		SILT: sandy, trace clay, very loose, wet, grey	SPT S06	90 90	1-1-2 (3)					
5	905.12			AU S07							
	904.22		Terminated at 5.40 m. Target depth reached.								

	LOGGED BY: RM	START DATE: July 07, 2023
	REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
	COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-05
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937210.04 536732.38	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 911.33 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	<ul style="list-style-type: none"> ▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%) 				REMARKS
							20	40	60	80	
	911.33		ASPHALT								
	911.00		Organic CLAY: silty, trace gravel, trace sand, firm, damp, grey-blue, frequent organics - large wood chunks	AU S01							
1	910.43		Organic PEAT: very loose, damp, dark brown	SPT S02	50	3-3-4 (7)					
	910.00		CLAY: silty, soft, medium plastic, damp, blue-grey	AU S03							
2	909.83		CLAY: some silt, firm to stiff, medium plastic, damp, brown	SPT S04	60	3-5-5 (10)					
	909.00			AU S05							
3	908.93			SPT S06	60	3-5-5 (10)					
	908.00			AU S07							
4	907.00										
5	906.00										
	905.93		Terminated at 5.40 m. Target depth reached.								
6	905.00										
7	904.00										
8	903.00										
9	902.00										

 McElhanney	LOGGED BY: RM	START DATE: July 07, 2023
	REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
	COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-06
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937140.42 536807.14	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 910.52 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%)				REMARKS
							20	40	60	80	
	910.52		Organic TOPSOIL: silty, clayey, loose, damp, dark, roots								
	910.00		FILL: silty, clayey, trace gravel, trace sand, firm, damp, mottled brown	AU S01							
1	909.52		Organic PEAT: very loose, damp, dark brown	SPT S02	60	4-7-4 (11)					
	909.02		CLAY: silty, firm to stiff, medium plastic, damp, grey								
2	908.12		CLAY: some silt, high plastic, firm to stiff, moist, brown	SPT S04	90	2-4-6 (10)					
	907.00			AU S05							
4			- soft	SPT S06	100	4-4-5 (9)					
	905.12		Terminated at 5.40 m. Target depth reached.	AU S07							
6											
7											
8											
9											



McElhanney

LOGGED BY: RM	START DATE: July 07, 2023
REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-07
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937629.20 536753.08	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 918.00 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%)				REMARKS	
							20	40	60	80		
	0.20		ASPHALT									
			GRAVEL FILL: 20mm road crush, compact, damp, brown									
1	917		CLAY: silty, soft, medium plastic, damp to moist, brown	AU S01								
2	916		- soft to firm, damp									
3	915		Silt TILL: sandy, some clay, trace gravel, compact, damp, brown	SPT S02	70 70	2-2-3 (5)						
4	914			SPT S04	100 100	4-7-7 (14)						WI = 36 Wp = 15 Ip = 21
5	913			AU S05								
	5.40		Terminated at 5.40 m. Target depth reached.									
6	912											
7	911											
8	910											
9	909											




McElhanney

LOGGED BY: RM	START DATE: July 07, 2023
REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-08
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937695.20 536883.91	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 917.14 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%)				REMARKS
							20	40	60	80	
	917		ASPHALT								
			GRAVEL FILL: 20mm road crush, compact, damp, brown								
1	916		SILT and CLAY: firm, medium plastic, damp, grey-brown	AU S01							Sand: 0.7% Silt: 47.9% Clay: 51.4%
2	915		- soft to firm								WI = 51 Wp = 19 Ip = 32
3	914		CLAY: silty, high plastic, soft to firm, damp to moist, grey								
4	913			SPT S04	90 90	2-2-5 (7)					
5	912		Silt TILL: sandy, some clay, trace cobbles, trace gravel, compact, damp, grey	AU S05	100 100	2-2-3 (5)					Gravel: 1.2% Sand: 30.7% Silt: 50.0% Clay: 18.1%
	911		Terminated at 5.40 m. Target depth reached.								
6	910										
7	909										
8	908										

 McElhanney	LOGGED BY: RM	START DATE: July 07, 2023
	REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
	COMPLETION DEPTH: 5.40 m	Sheet 1 of 1

CLIENT: Town of Edson	PROJECT: 10th Ave and 6th Ave Sanitary	BOREHOLE No. BH23-09
CONTRACTOR: Mobile Augers	CO-ORDS N/E: 5937755.15 537010.01	PROJECT No. 3231-11020-00
METHOD: Solid Stem/MARL M10	LOCATION: Edson, AB	ELEVATION: 917.11 m

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	▲ N Value ● Moisture Content (%) Plastic/Liquid Limit (%) □ Fines Content (%)				REMARKS
							20	40	60	80	
	917		ASPHALT								
	916.91		GRAVEL FILL: 20mm road crush, compact, damp, brown								
1	916		CLAY: some silt, firm to stiff, medium plastic, damp, grey-brown	AU S01							
	916.21										
2	915			SPT S02	100 100	3-4-6 (10)					
3	914			AU S03							
4	913			SPT S04	100 100	4-2-5 (7)					
	912.81		Terminated at 4.30 m. Target depth reached.								
5	912										
6	911										
7	910										
8	909										
9	908										



McElhanney

LOGGED BY: RM	START DATE: July 07, 2023
REVIEWED BY: MM	COMPLETION DATE: July 07, 2023
COMPLETION DEPTH: 4.30 m	Sheet 1 of 1

APPENDIX C – LABORATORY TEST REPORTS

PARTICLE SIZE ANALYSIS (HYDROMETER) REPORT

Tested in accordance with AASHTO T88 Particle Size Analysis of Soils (modified)

Project No: 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.

Lab ID: S23542
Client Project: Town of Edson

Attn: Ryan Gibbard
CC: -

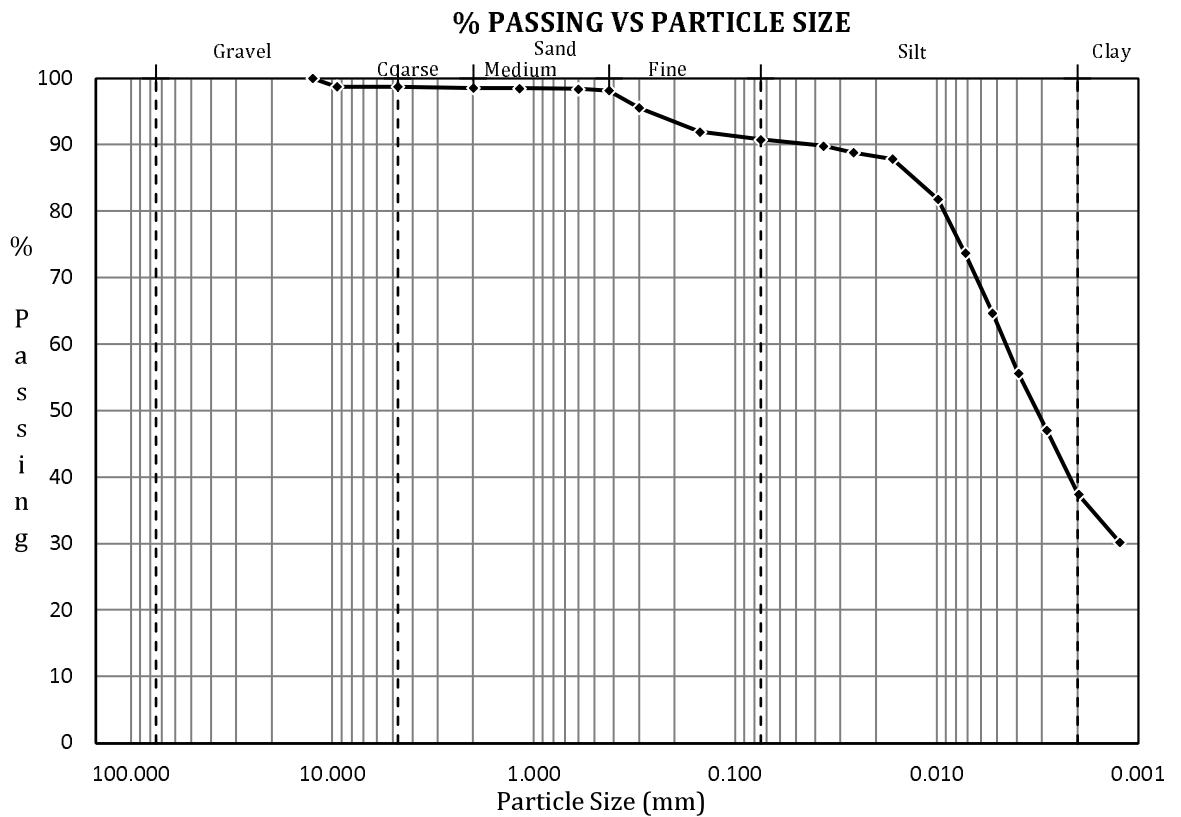
Date Received: July 14, 2023

Sample Description: SILT and CLAY, trace gravel, trace sand
Sample ID: BH23-04 S04
Sample Source: Geotechnical Investigation

Sample Date: -
Sample Time: -
Sampled By: Client

Sieve Analysis	
Sieve Size (mm)	% Passing
150	
75	
37.5	
19	
12.5	100.0
9.5	98.7
4.75	98.7
2.00	98.5
1.18	98.5
0.600	98.3
0.425	98.1
0.300	95.5
0.150	91.9
0.075	90.7

Hydrometer Analysis	
Diameter of particle (mm)	% Smaller than
0.0366	89.8
0.0259	88.8
0.0166	87.8
0.0099	81.8
0.0072	73.7
0.0053	64.7
0.0039	55.6
0.0028	47.0
0.0020	37.4
0.0012	30.2



Summary

Cobble:	>75mm	0.0 %
Gravel:	< 75mm and > 4.75mm	1.3 %
Sand:	< 4.75mm and > 0.075mm	7.9 %
Silt:	< 0.075mm and > 0.002mm	53.2 %
Clay:	< 0.002mm	37.5 %

Moisture Content: 27.2 %

Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

PARTICLE SIZE ANALYSIS (HYDROMETER) REPORT

Tested in accordance with AASHTO T88 Particle Size Analysis of Soils (modified)

Project No: 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.

Lab ID: S23550
Client Project: Town of Edson

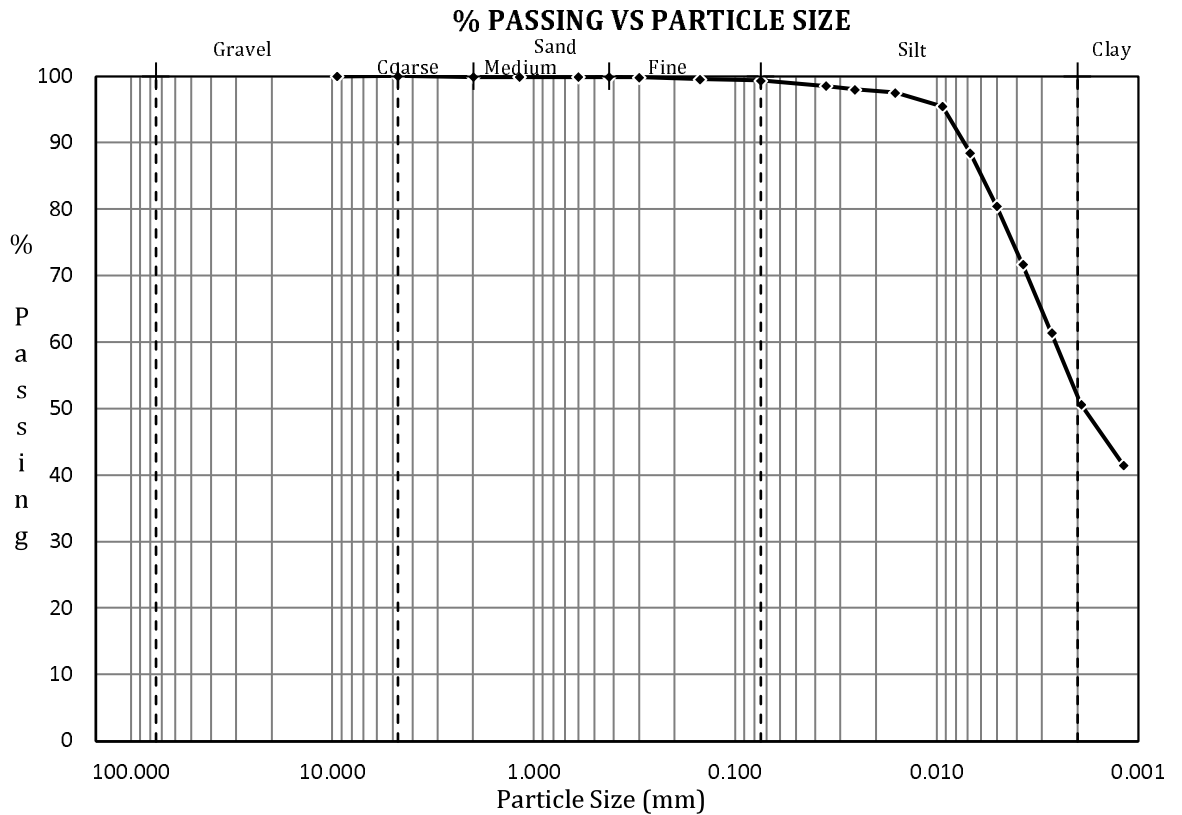
Attn: Ryan Gibbard
CC: -

Date Received: July 14, 2023

Sample Description: SILT and CLAY
Sample ID: BH23-08 S01
Sample Source: Geotechnical Investigation

Sample Date: -
Sample Time: -
Sampled By: Client

Sieve Analysis	
Sieve Size (mm)	% Passing
150	
75	
37.5	
19	
12.5	
9.5	100.0
4.75	100.0
2.00	99.9
1.18	99.9
0.600	99.9
0.425	99.9
0.300	99.8
0.150	99.5
0.075	99.3



Hydrometer Analysis	
Diameter of particle (mm)	% Smaller than
0.0355	98.5
0.0254	98.0
0.0161	97.5
0.0094	95.4
0.0068	88.4
0.0050	80.4
0.0037	71.6
0.0027	61.3
0.0019	50.6
0.0012	41.5


Summary

Cobble:	>75mm	0.0 %
Gravel:	< 75mm and > 4.75mm	0.0 %
Sand:	< 4.75mm and > 0.075mm	0.7 %
Silt:	< 0.075mm and > 0.002mm	47.9 %
Clay:	< 0.002mm	51.4 %

Moisture Content: 27.1 %

Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

PARTICLE SIZE ANALYSIS (HYDROMETER) REPORT

Tested in accordance with AASHTO T88 Particle Size Analysis of Soils (modified)

Project No: 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.

Lab ID: S23554
Client Project: Town of Edson

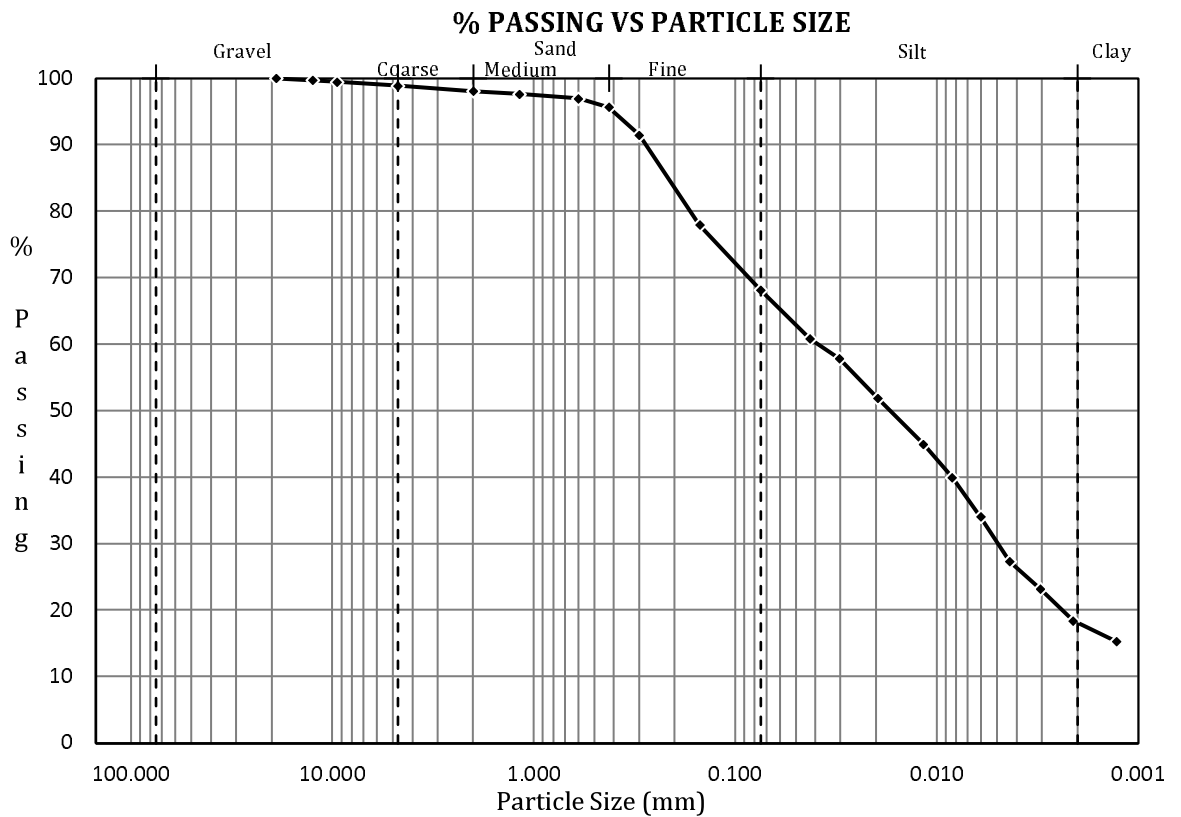
Attn: Ryan Gibbard
CC: -

Date Received: July 14, 2023

Sample Description: Sandy SILT, some clay, trace gravel
Sample ID: BH23-08 S05
Sample Source: Geotechnical Investigation

Sample Date: -
Sample Time: -
Sampled By: Client

Sieve Analysis	
Sieve Size (mm)	% Passing
150	
75	
37.5	
19	100.0
12.5	99.7
9.5	99.4
4.75	98.8
2.00	98.0
1.18	97.6
0.600	96.9
0.425	95.6
0.300	91.4
0.150	77.9
0.075	68.1



Hydrometer Analysis	
Diameter of particle (mm)	% Smaller than
0.0425	60.8
0.0304	57.8
0.0197	51.9
0.0117	44.9
0.0084	40.0
0.0061	34.0
0.0043	27.3
0.0031	23.2
0.0021	18.4
0.0013	15.3

Summary

Cobble:	>75mm	0.0 %
Gravel:	< 75mm and > 4.75mm	1.2 %
Sand:	< 4.75mm and > 0.075mm	30.7 %
Silt:	< 0.075mm and > 0.002mm	50.0 %
Clay:	< 0.002mm	18.1 %

Moisture Content: 17.9 %

Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

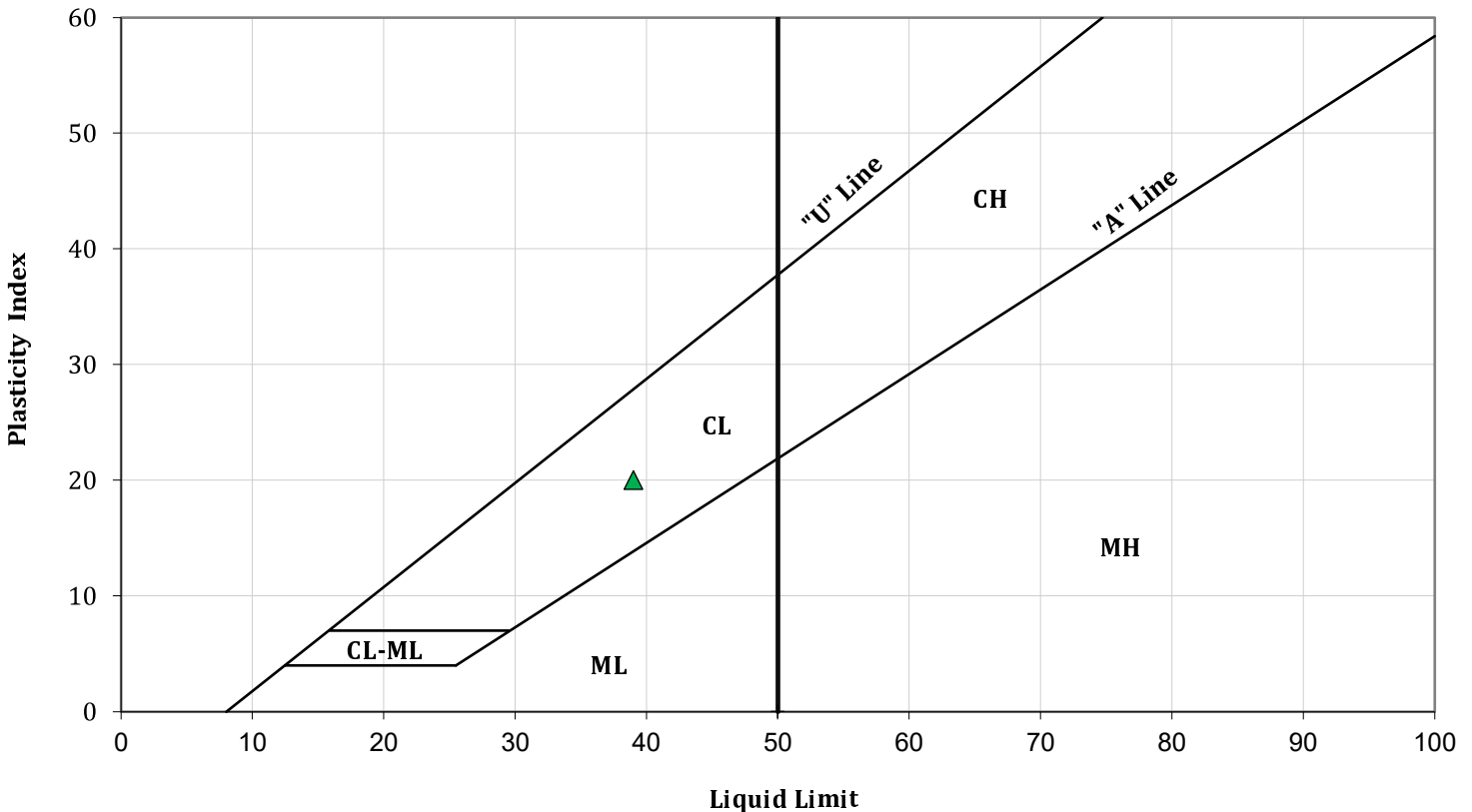
MATERIALS TESTING & INSPECTION

ATTERBERG LIMITS REPORT
Tested in accordance with ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils

Project No:	23.0003.AR	Lab ID:	S23640
Project:	McElhanney General	Client Project:	Town of Edson
Client:	McElhanney Consulting Services Ltd.	Date Received:	August 2, 2023
Attn:	Ryan Gibbard	Sample Date:	-
CC:	-	Sample Time:	-
Sample Description:	-	Sampled By:	Client
Sample ID:	BH23-01 S03		
Sample Source:	Geotechnical Investigation		

Method: Wet Preparation

Soil Classification (USCS)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
CL	29.2%	39	19	20


Comments: -

Report Date: August 14, 2023

Reviewed By: 
 Bryan Morrison, BSc.

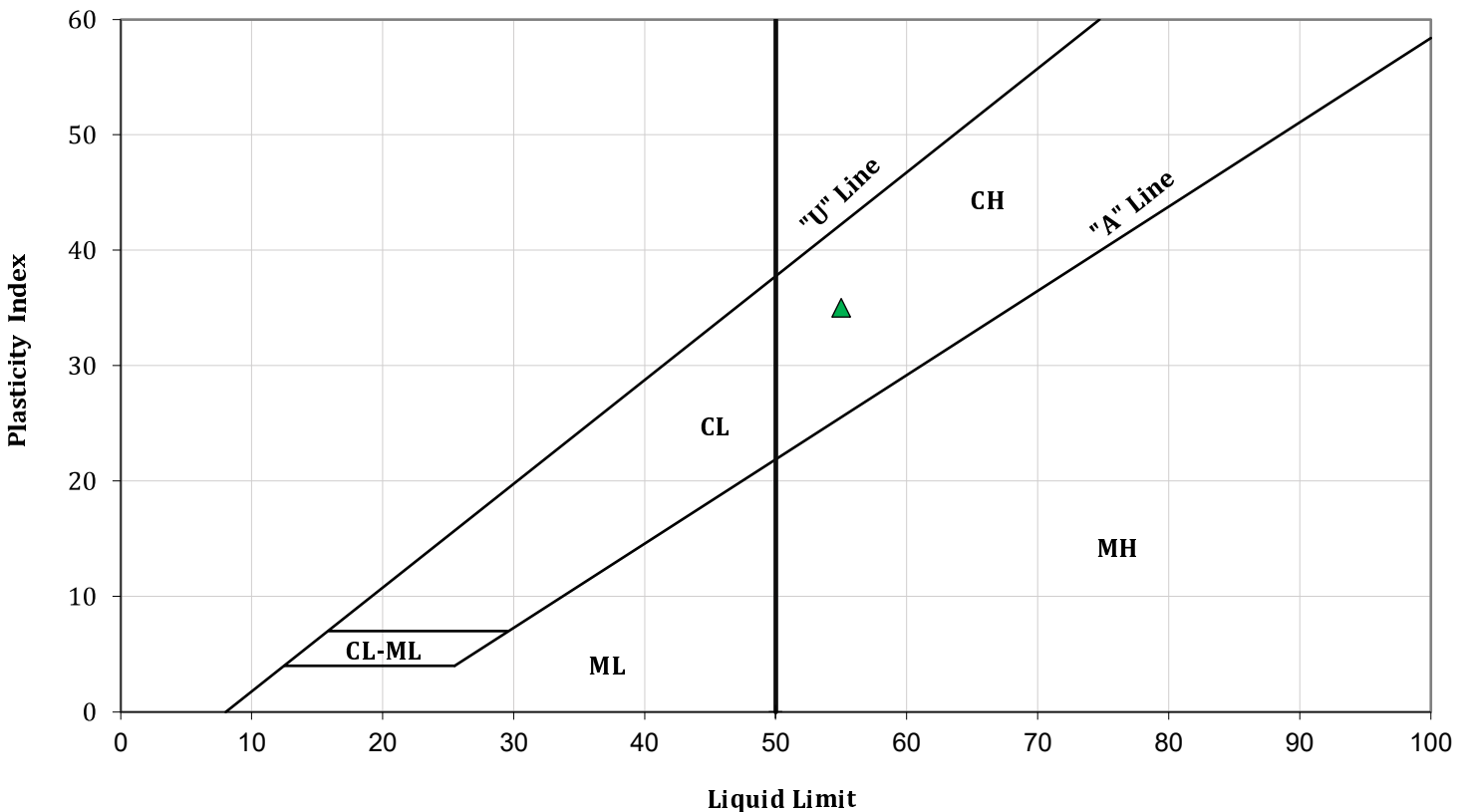
MATERIALS TESTING & INSPECTION

ATTERBERG LIMITS REPORT
Tested in accordance with ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils


Project No:	23.0003.AR	Lab ID:	S23539
Project:	McElhanney General	Client Project:	Town of Edson
Client:	McElhanney Consulting Services Ltd.	Date Received:	July 14, 2023
Attn:	Ryan Gibbard	Sample Date:	-
CC:	-	Sample Time:	-
Sample Description:	-	Sampled By:	Client
Sample ID:	BH23-03 S05		
Sample Source:	Geotechnical Investigation		

Method: Wet Preparation

Soil Classification (USCS)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
CH	38.9%	55	20	35


Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

MATERIALS TESTING & INSPECTION

ATTERBERG LIMITS REPORT
Tested in accordance with ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils

Project No: 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.

Lab ID: S23641
Client Project: Town of Edson

Attn: Ryan Gibbard
CC: -

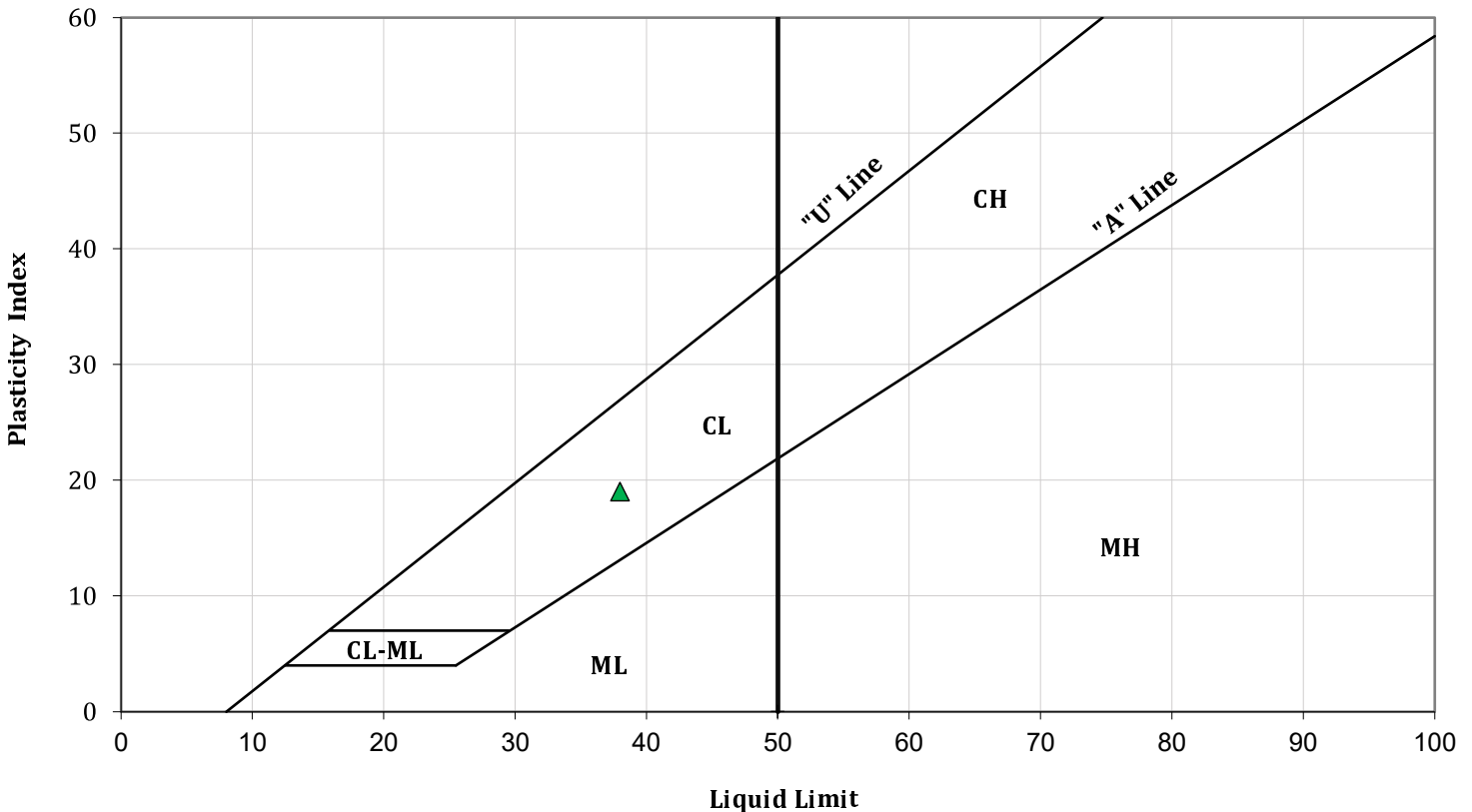
Date Received: August 2, 2023

Sample Description: -
Sample ID: BH23-04 S05
Sample Source: Geotechnical Investigation

Sample Date: -
Sample Time: -
Sampled By: Client


Method: Wet Preparation

Soil Classification (USCS)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
CL	30.9%	38	19	19



Comments: -

Report Date: August 14, 2023

Reviewed By: 
 Bryan Morrison, BSc.

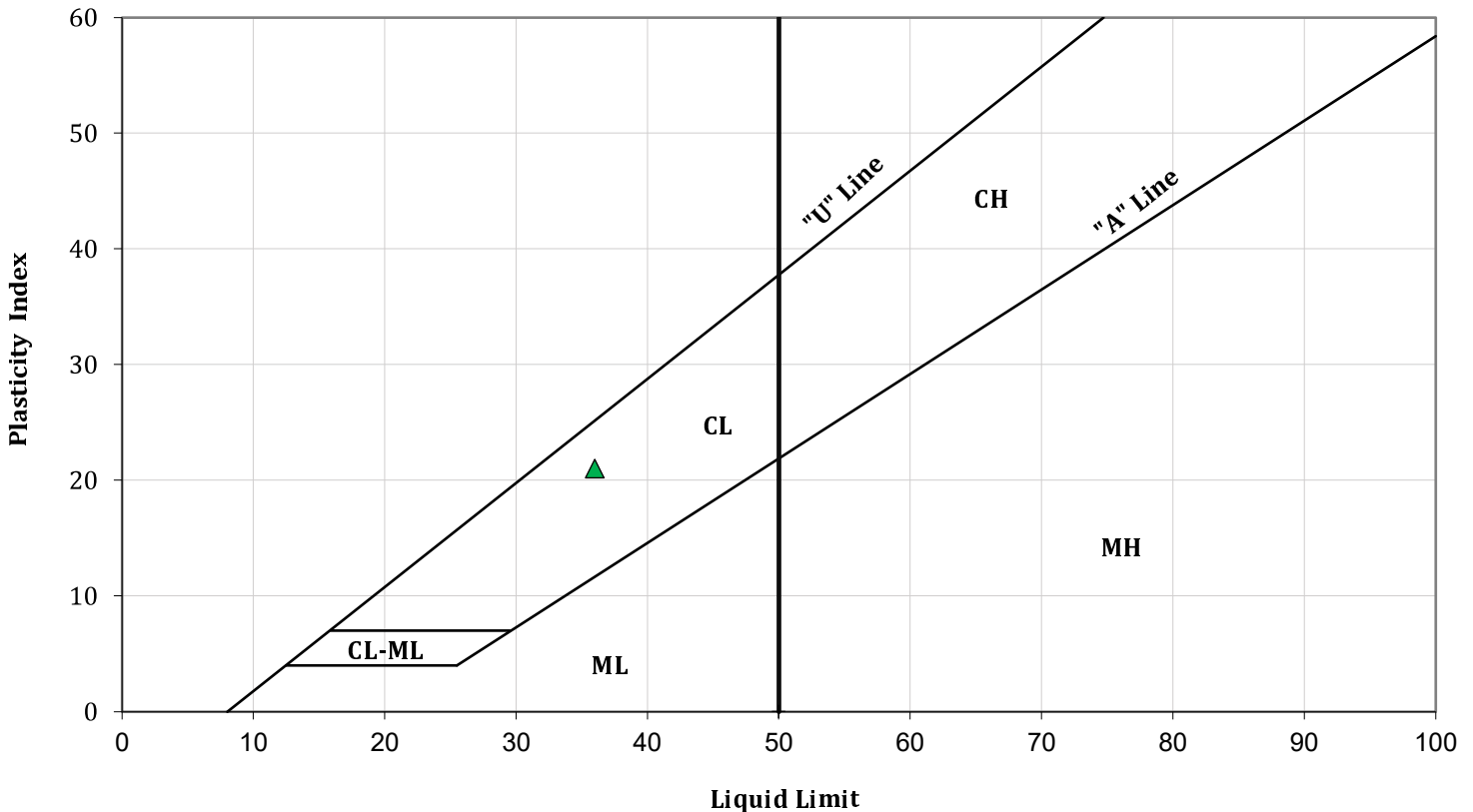
MATERIALS TESTING & INSPECTION

ATTERBERG LIMITS REPORT
Tested in accordance with ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils


Project No:	23.0003.AR	Lab ID:	S23548
Project:	McElhanney General	Client Project:	Town of Edson
Client:	McElhanney Consulting Services Ltd.	Date Received:	July 14, 2023
Attn:	Ryan Gibbard	Sample Date:	-
CC:	-	Sample Time:	-
Sample Description:	-	Sampled By:	Client
Sample ID:	BH23-07 S04		
Sample Source:	Geotechnical Investigation		

Method: Wet Preparation

Soil Classification (USCS)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
CL	18.9%	36	15	21


Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

MATERIALS TESTING & INSPECTION

ATTERBERG LIMITS REPORT
Tested in accordance with ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils

Project No: 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.

Lab ID: S23551
Client Project: Town of Edson

Attn: Ryan Gibbard
CC: -

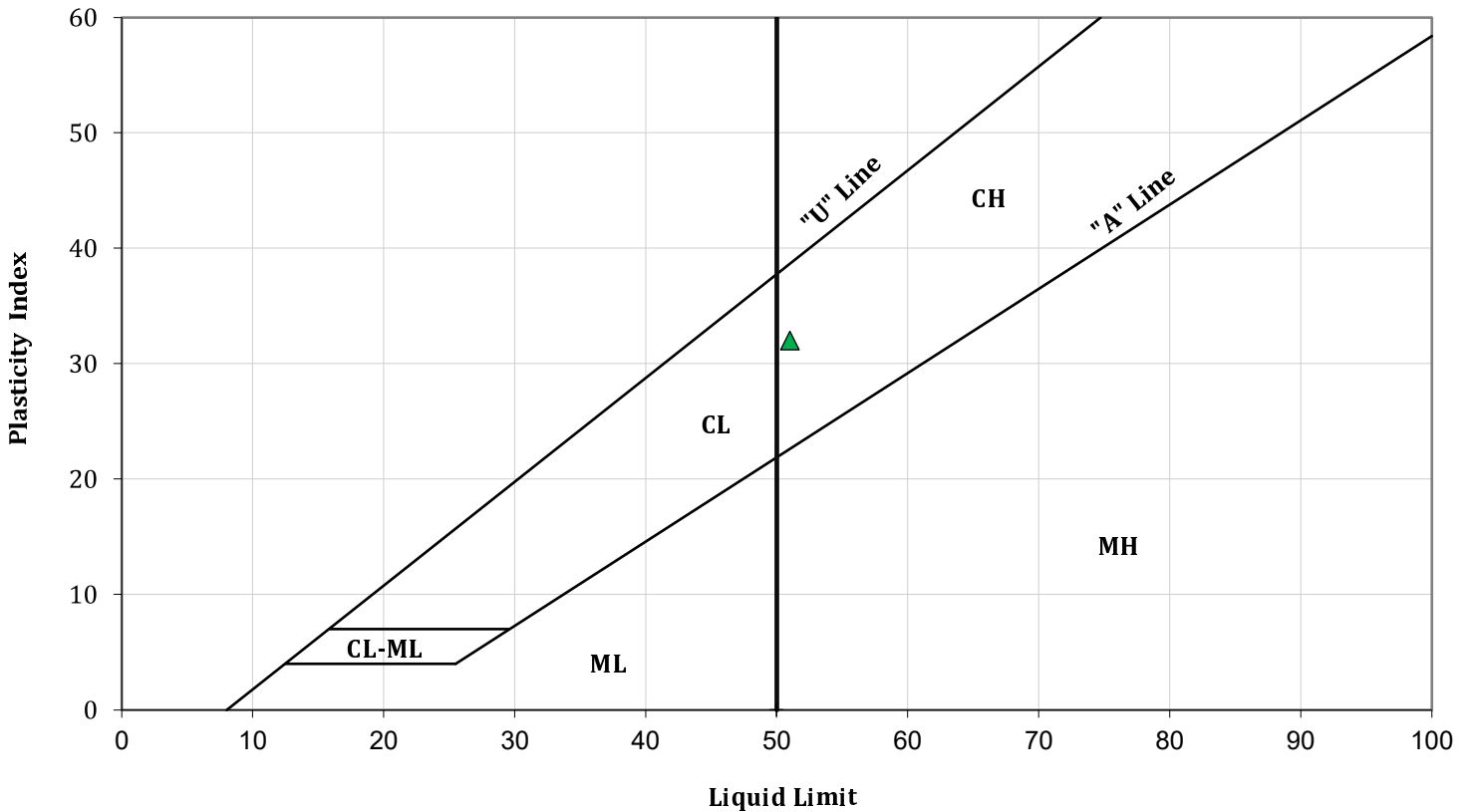
Date Received: July 14, 2023

Sample Description: -
Sample ID: BH23-08 S02
Sample Source: Geotechnical Investigation

Sample Date: -
Sample Time: -
Sampled By: Client


Method: Wet Preparation

Soil Classification (USCS)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
CH	29.9%	51	19	32




Comments: -

Report Date: July 25, 2023

Reviewed By: 
 Bryan Morrison, BSc.

MOISTURE CONTENT REPORT*Tested in accordance with ASTM D2216 Laboratory Determination of Water
(Moisture) Content of Soil and Rock by Mass***Project No:** 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.**Client Project:** Town of Edson**Attn:** Ryan Gibbard
CC: -**Date Received:** July 14, 2023**Sample Source:** Geotechnical Investigation
Sample Date: -
Sample Time: -
Sampled By: Client


Lab ID	Sample ID	Moisture Content
S23533	BH23-01 S01	21.1%
S23534	BH23-01 S04	30.5%
S23535	BH23-02 S05	28.6%
S23536	BH23-02 S07	31.5%
S23537	BH23-03 S02	14.2%
S23538	BH23-03 S04	33.3%
S23539	BH23-03 S05	38.9%
S23540	BH23-04 S02	18.0%
S23541	BH23-04 S03	25.2%
S23542	BH23-03 S04	27.2%
S23543	BH23-05 S02	33.6%
S23544	BH23-05 S07	31.3%

Comments: -**Report Date:** July 25, 2023**Reviewed by:** 
Bryan Morrison, BSc.

*Reporting of these results constitutes a testing service only. No engineering interpretation of the results is expressed or implied.
Additional data or information can be provided upon written request.*

MOISTURE CONTENT REPORT*Tested in accordance with ASTM D2216 Laboratory Determination of Water
(Moisture) Content of Soil and Rock by Mass***Project No:** 23.0003.AR
Project: McElhanney General
Client: McElhanney Consulting Services Ltd.**Client Project:** Town of Edson**Attn:** Ryan Gibbard
CC: -**Date Received:** July 14, 2023**Sample Source:** Geotechnical Investigation
Sample Date: -
Sample Time: -
Sampled By: Client

Lab ID	Sample ID	Moisture Content
S23545	BH23-06 S03	25.2%
S23546	BH23-06 S06	28.7%
S23547	BH23-07 S03	18.0%
S23548	BH23-07 S04	18.9%
S23549	BH23-07 S05	17.1%
S23550	BH23-08 S01	27.1%
S23551	BH23-08 S02	29.9%
S23552	BH23-08 S03	32.4%
S23553	BH23-08 S04	39.2%
S23554	BH23-08 S05	17.9%
S23555	BH23-09 S02	27.2%
S23556	BH23-09 S04	30.9%

Comments: -**Report Date:** July 25, 2023**Reviewed by:** 
Bryan Morrison, BSc.

*Reporting of these results constitutes a testing service only. No engineering interpretation of the results is expressed or implied.
Additional data or information can be provided upon written request.*

**APPENDIX D – NBCC 2020 SEISMIC
HAZARD CALCULATION**



Government
of Canada

Gouvernement
du Canada

[Canada.ca](#) > [Natural Resources Canada](#) > [Earthquakes Canada](#)

2020 National Building Code of Canada Seismic Hazard Tool

i This application provides seismic values for the design of buildings in Canada under Part 4 of the National Building Code of Canada (NBC) 2020 as prescribed in Article 1.1.3.1. of Division B of the NBC 2020.

Seismic Hazard Values

User requested values

Code edition	NBC 2020
Site designation X_S	X_E
Latitude (°)	53.581
Longitude (°)	-116.442

Please select one of the tabs below.

NBC 2020

Additional Values

Plots

API

Background Information

The 5%-damped spectral acceleration ($S_a(T,X)$, where T is the period, in s , and X is the site designation) and peak ground acceleration ($PGA(X)$) values are given in units of acceleration due to gravity (g , 9.81 m/s^2). Peak

ground velocity, (PGV(X)) values are given in m/s. Probability is expressed in terms of percent exceedance in 50 years. Further information on the calculation of seismic hazard is provided under the *Background Information* tab.

The 2%-in-50-year seismic hazard values are provided in accordance with Article 4.1.8.4. of the NBC 2020. The 5%- and 10%-in-50-year values are provided for additional performance checks in accordance with Article 4.1.8.23. of the NBC 2020.

See the *Additional Values* tab for additional seismic hazard values, including values for other site designations, periods, and probabilities not defined in the NBC 2020.

NBC 2020 - 2%/50 years (0.000404 per annum) probability

$S_a(0.2, X_E)$	$S_a(0.5, X_E)$	$S_a(1.0, X_E)$	$S_a(2.0, X_E)$	$S_a(5.0, X_E)$	$S_a(10.0, X_E)$	PGA(X_E)	PGV(X_E)
0.301	0.287	0.169	0.0912	0.0461	0.0261	0.157	0.163

The log-log interpolated 2%/50 year $S_a(4.0, X_E)$ value is : **0.0544**

▼ Tables for 5% and 10% in 50 year values

NBC 2020 - 5%/50 years (0.001 per annum) probability

$S_a(0.2, X_E)$	$S_a(0.5, X_E)$	$S_a(1.0, X_E)$	$S_a(2.0, X_E)$	$S_a(5.0, X_E)$	$S_a(10.0, X_E)$	PGA(X_E)	PGV(X_E)
0.187	0.181	0.104	0.0562	0.0237	0.0104	0.0906	0.101

The log-log interpolated 5%/50 year $S_a(4.0, X_E)$ value is : **0.0292**

NBC 2020 - 10%/50 years (0.0021 per annum) probability

$S_a(0.2, X_E)$	$S_a(0.5, X_E)$	$S_a(1.0, X_E)$	$S_a(2.0, X_E)$	$S_a(5.0, X_E)$	$S_a(10.0, X_E)$	PGA(X_E)	PGV(X_E)
-----------------	-----------------	-----------------	-----------------	-----------------	------------------	--------------	--------------

$S_a(0.2, X_E)$	$S_a(0.5, X_E)$	$S_a(1.0, X_E)$	$S_a(2.0, X_E)$	$S_a(5.0, X_E)$	$S_a(10.0, X_E)$	PGA(X_E)	PGV(X_E)
0.121	0.118	0.0678	0.0361	0.0128	0.00444	0.056	0.0662

The log-log interpolated 10%/50 year $S_a(4.0, X_E)$ value is : **0.0165**

Download CSV

← Go back to the [seismic hazard calculator form](#)

Date modified: 2021-04-06

APPENDIX E – STATEMENT OF LIMITATIONS



Statement of Limitations – Geotechnical Services

Use of this Report. This report was prepared by McElhanney Ltd. ("McElhanney") for the particular site, design objective, development and purpose (the "Project") described in this report and for the exclusive use of the client identified in this report (the "Client"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client and Building Authority, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies. The professional services retained for this Project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in this report. In particular, environmental conditions such as surface and subsurface contamination are outside the scope of this report.

Standard of Care and Disclaimer of Warranties. This study and report have been prepared in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report including, without limitation, any warranty that this report and the associated site review work has uncovered all potential geotechnical liabilities associated with the subject property.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Subsurface Risks. Soil, rock and groundwater data were collected in general accordance with the standards and methods described in the document. The classification and identification of soils, rocks and geologic formations was based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Interpretations of groundwater levels and flow direction are based on water level observations at selected test hole locations and are expected to fluctuate. Observations at test holes indicate the approximate subsurface conditions at those locations only. Subsurface conditions between test holes were based, by necessity, on judgement and assumptions of what exists between the actual locations sampled, and may vary significantly from actual site conditions and all persons making use of this report should be aware of, and accept, this risk. Even a comprehensive sampling and testing program, implemented in accordance with appropriate equipment by experienced personnel, may fail to detect all or certain conditions.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Underground Utilities and Damages. In the performance of the services, McElhanney has taken reasonable precautions to avoid damage or injury to subterranean structures or utilities. Subsurface sampling may result in unavoidable contamination of certain subsurface areas not known to be previously contaminated such as, but not limited to, a geologic formation, the groundwater or other hydrous body. McElhanney will adhere to an appropriate standard of care during the conduct of any subsurface sampling.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

Construction. The subsurface information contained in this report were obtained for the owner's information and design. The extent and detail of assessments necessary to determine all relevant conditions that may affect construction costs would normally be greater than the assessments carried out for this report. Accordingly, a contingency fund to allow for the possibility of variations of subsurface conditions should be included in the construction budget to cover costs associated with modifications of the design and construction procedures resulting from conditions that vary from the assumptions in this report. If during construction, subsurface conditions are found to be other than those described in this report, McElhanney is to be notified and may alter or modify the geotechnical report recommendations. If McElhanney is not retained to provide services during construction, then McElhanney is not responsible for confirming or recording that subsurface conditions do not materially differ from those interpreted conditions contained in this report or for confirming or recording that construction activities have not adversely affected subsurface conditions or the recommendations contained in this report.

Contact

Michael McCormick, M.Eng., P. Eng.

780 719 1776

mmccormick@mcelhanney.com



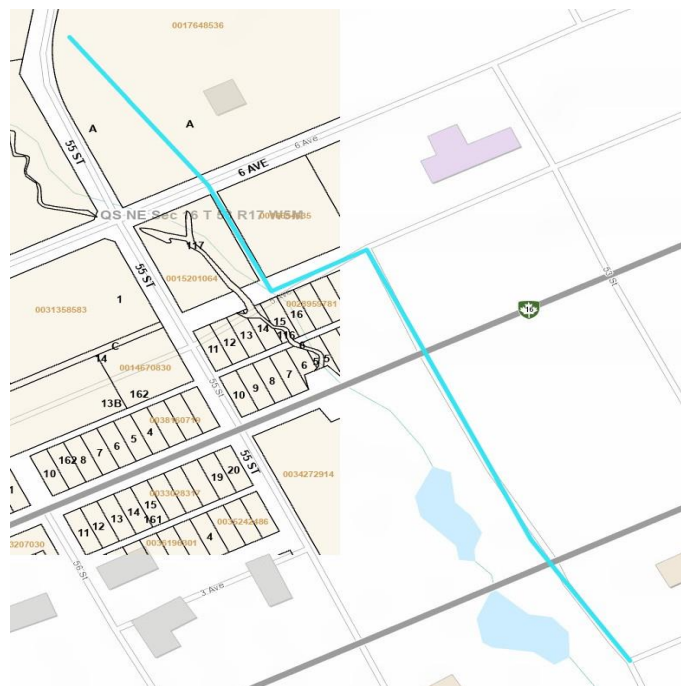
McElhanney



Transportation and Economic Corridors Permit

Request for Utility Installation - **Approved**

Permit Number:	2023-0038848	Highway(s):	16, 748, 16X
Issued to (Permittee):	Town of Edson 605 50 St, Edson, AB T7E 1T7 iullrich@mcelhanney.com		
Legal Land Location:	QS-NE SEC-16 TWP-053 RGE-17 MER-5	Municipality:	Edson
Approved By:	Nuzhat Butt	Issuing Office:	North Central Region / Edson
Issued Date:	2023-12-22		
Utility Type:	Utility - Water and Sewer Pipeline		
Description of Development:	<p>Town of Edson is to upgrade their existing sanitary sewer pipe along 54 Street. This includes upgrading a 375mm diameter pipe to 450mm diameter crossing 4 Avenue (Highway 16 westbound) and upgrading a 450mm diameter pipe to 600mm diameter crossing 2 Avenue (Highway 16 eastbound). Trenchless installation has been deemed too high-risk to pursue for this installation due to the vicinity of other pipes crossing the proposed pipe upgrades. Therefore, the pipe upgrades crossing 2 Avenue and 4 Avenue have been proposed as open cut.</p> <p>Trench box support system will be used for the open excavation. The size of the trench is 4m deep and 3ft wide. Backfilling of the excavation is to be completed with fillcrete.</p>		



Transportation and Economic Corridors Permit No. **2023-0038848** is issued to the above named Permittee under authority of Section 14 of the *Highways Development and Protection Act* (the Act) authorizing the development(s) listed herein, and a further application is required for any changes or additions.

The approved site plan forms a part of this permit and any changes to the approved site plan will require an amendment or a new permit application.

This permit is subject to the following terms and conditions, which should be carefully reviewed:

1. This permit is subject to the provisions of Section 11-19 inclusive of the Highways Development and Protection Act (Chapter H-8.5 2004), amendments thereto, and Highways Development and Protection Regulation (Alberta Regulation 326/2009) and amendments thereto.
2. The Permittee shall be responsible for all costs of any damages to the highway resulting from utility placement, maintenance and operation. In the event highway-related work authorized by Transportation and Economic Corridors involves a ground disturbance within proximity of a utility location, except in an emergency, the department or authorized representative or agent shall give forty-eight hours' notice (weekends & statutory holidays excluded) to the Permittee, through Utility Safety Partners. The Permittee shall, within forty-eight hours' notice, mark or expose the utility and the utility shall then be exposed by the Permittee before excavation machinery is used. Costs to maintain membership in Utility Safety Partners, or to locate, mark and expose a utility, shall be borne by the Permittee.
3. All Work inside the highway right-of-way shall conform to current standards and regulations, and be carried out in such a manner so as not to endanger public safety. The Permittee shall undertake all reasonable precautions to protect and safeguard the lives and property of the travelling public and property owners. This includes barricading, signing and flagmen as required. No work shall be done during darkness or reduced visibility.
4. Wherever herein the "Permittee" is referred to, the same shall extend to include his heirs, executors, administrators, or assigns, and the successors and assigns of the Permittee, if the Permittee is an incorporated company.
5. A valid permit is to be on-site at all times. No work may commence without a valid permit, and only work specified in the permit may be performed. Any deviations or changes shall require a new permit.
6. The utility installation approved by this permit shall conform to the drawings submitted with this application. No changes can be made to the proposed installation after the drawings have been approved, without revision of this permit or written approval from the District Office.
7. In consideration of the permit issued in respect to this utility, the Permittee shall indemnify and hold harmless Transportation and Economic Corridors, its employees and agents from any and all claims, demands, actions and costs whatsoever that may arise, directly or indirectly from anything done or omitted to be done in the construction, maintenance, alteration or operation of the works authorized.
8. All works authorized by this permit shall be constructed, altered, maintained or operated at the sole expense of the Permittee. The Permittee consents to a person designated by Transportation and Economic Corridors to enter upon land for the purpose of inspection during the processing of this application.

9. The Permittee places the utility in the right-of-way entirely at its own risk, and the Minister, his representative or agent, shall not be responsible or liable in any way to the Permittee, its contractors, agents or its customers for any damage or loss to the utility.

10. Failure to comply with the terms and/or conditions of this permit will result in construction shut-down by Transportation and Economic Corridors.

11. A detailed Traffic Accommodation Strategy (TAS) must be provided to Transportation and Economic Corridors for review and acceptance a minimum of ten (10) business days prior to commencing work. The requirements of the TAS can be found in the most current version of the department manual entitled Traffic Accommodation in Work Zones. The Permittee will be responsible for providing any necessary measures to safely accommodate traffic through the work area and Permittee shall monitor the traffic control measures to ensure that the traffic accommodation strategy (TAS) is performing as intended and adjustments to the TAS may be necessary to address unanticipated situations. If field adjustments to this are made during this project, please submit a copy of the amended TAS for review and acceptance at your earliest convenience. You must remove and/or cover all signs when work is not in progress. Transportation and Economic Corridors will not supply signs.

12. The permittee shall notify Alberta Transportation through the RPATH portal at least five (5) full working days prior to commencing work on Alberta Transportation rights-of-way to review signing and safety; and at least five (5) full working days prior to completion of construction to inspect site clean-up and restoration of disturbed areas. Reclamation of the disturbed areas within the highway right-of way shall be done in a timely manner, to the satisfaction of Transportation and Economic Corridors. All waste material shall be removed and all disturbed areas shall be backfilled, compacted and re-paved to restore the right-of-way to at least an acceptable condition.

13. The filling of the excavated areas in the Hwy right of way shall be done with fillcrete.

14. The repaving of Hwy 16 will match the existing pavement structure or better. Following pavement design is acceptable:

- ACP Mix Type H2 (PG 58-28)
- ACP thickness, match to existing.
- GBC, Des. 2-25
- GBC thickness, match existing

15. Top cover of manholes within the Hwy right of way will be flushed to the finished surface.

16. The utility shall be placed in such a fashion so as not to interfere with the operation or maintenance of the highway facility, and where practical, future upgrading of the highway facility. The Permittee agrees to relocate the utility to a location approved by the Minister, if and when required by highway or highway related work approved by the Minister. The Permittee shall be solely responsible for all such Line modification, protection, and/or relocation costs, whether undertaken by the Minister or the Minister's authorized representative.

17. The permittee will be responsible for any settlement or deficiency with the highway surface or right of way caused by installation of the utility for a period of two years following notification of completion of the utility construction.

18. The presence of the utility within the highway right-of-way shall, under no circumstances, increase the Minister's costs for highway operation, construction or maintenance, and if so, the added cost shall be borne by the Permittee.

19. All damages to any highways or roads which may occur resulting from operations under this permit shall be immediately rectified by the Permittee. No equipment or materials shall be stored on the shoulder, sideslope or backslope of the highway.

20. The permittee shall comply with all other applicable federal, provincial, and/or local acts, regulations, or bylaws that may affect the installation of the utility.

Failure to comply with the terms and conditions of this permit is an offense pursuant to Section 35 of the Highways Development and Protection Regulation (the Regulation), and may result in enforcement or penalties as described in Section 55 of the Act and Section 35-36 of the Regulation.

This permit is valid for a period of **one year from the date of issuance**. If the works authorized by this permit have not commenced within this timeframe, the permit expires and the Permittee must submit a request for an extension, or reapply for a new permit, if they wish to proceed. Transportation and Economic Corridors is under no obligation to reissue a permit if the development is not commenced before expiry of this permit.

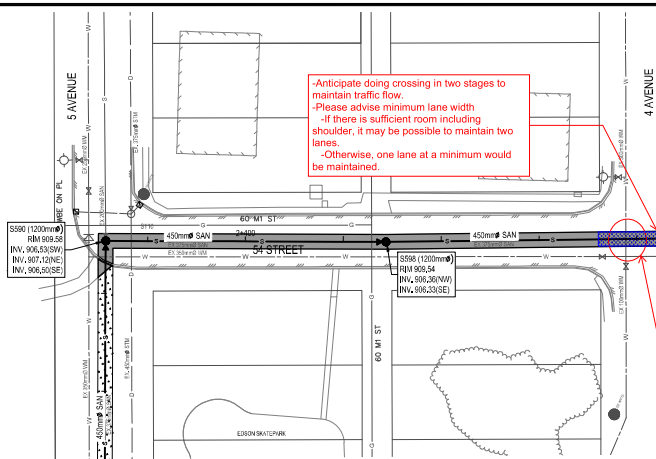
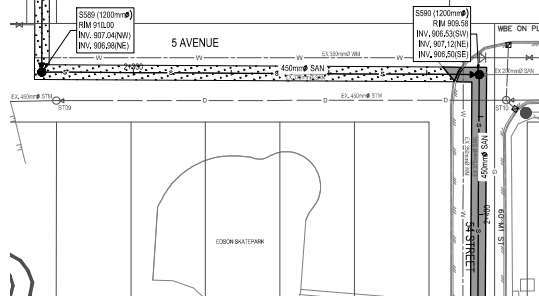
Please contact Transportation and Economic Corridors through [RPATH0038848](#) if you have any questions, updates, additions, or require additional information.



Issued by **Nuzhat Butt, Dev and Planning Technologist**, on behalf of the Minister of Transportation and Economic Corridors pursuant to *Ministerial Order 52/20 – Department of Transportation and Economic Corridors Delegation of Authority*

APPROVAL SUBJECT TO
CONDITIONS STATED ON

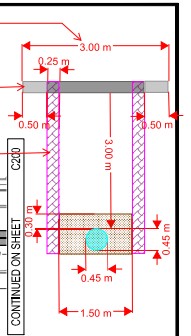
PERMIT No. 2023-0038848



Total Approx 3.0m
 -0.25m x 2 for asphalt damage resulting from sawcut
 -0.5m x 2 for trenchbox exterior allowance
 -0.5m x 2 for working area outside of pipe width
 -0.45m for pipe diameter

Allow 0.50m for damage resulting from sawcut

Assume 0.25m for trench box structure

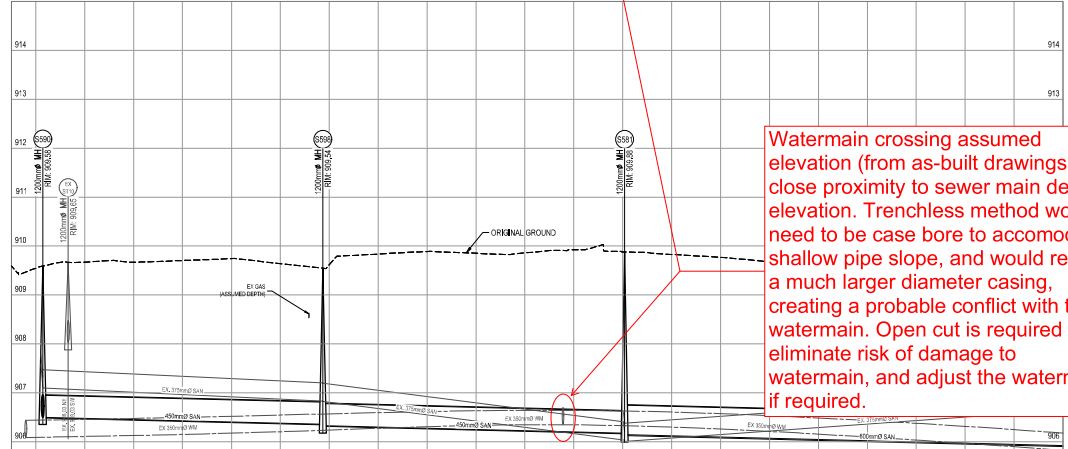
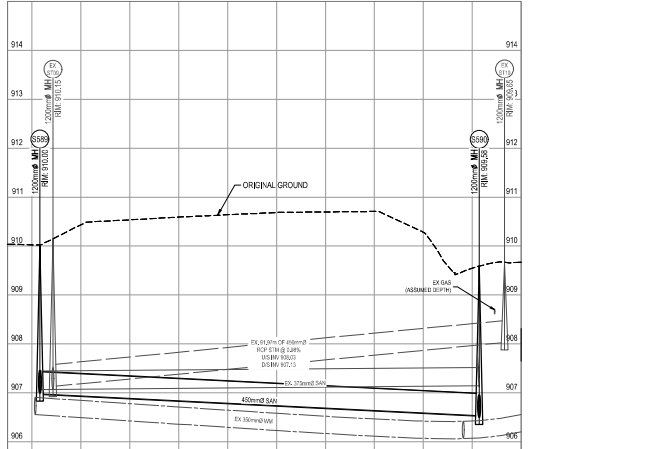


-Anticipate doing crossing in two stages to maintain traffic flow.
 -Please advise minimum lane width shoulder, it may be possible to maintain two lanes.
 -Otherwise, one lane at a minimum would be maintained.

- GENERAL NOTES:
- ALL DISTANCE AND ELEVATIONS ARE SHOWN IN METRES AND DECIMALS THEREOF UNLESS NOTED OTHERWISE.
 - ELEVATIONS ARE GROUND LEVEL UNLESS OTHERWISE NOTED. ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CORS/APP.
 - ALL SERVICE CONNECTIONS (W & SAN) ASSUMED AS COPPER OR PVC UNLESS OTHERWISE INDICATED AND LOCATIONS TO BE VERIFIED BY CONTRACTOR PRIOR TO EXCAVATION.

UTILITY LOCATES

NO RESPONSIBILITY IS IMPLIED OR ASSUMED BY THE ENGINEER/LANDSCAPE ARCHITECT AS TO THE LOCATION AND ELEVATION OF ANY UTILITY. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE AND LOCATION FOR ALL UTILITIES THAT MAY BE IMPACTED AND MUST CONTACT THE VARIOUS UTILITY COMPANIES FOR THE SITE PRIOR TO COMMENCEMENT OF ANY OPERATIONS. PROVIDE YOUR LANDSCAPE ARCHITECT WITH COPY OF ALL UTILITY REPORTS.



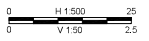
Watermain crossing assumed elevation (from as-built drawings) in close proximity to sewer main design elevation. Trenchless method would need to be case bore to accommodate shallow pipe slope, and would require a much larger diameter casing, creating a probable conflict with the watermain. Open cut is required to eliminate risk of damage to watermain, and adjust the watermain if required.

CHAINAGE	ORIGINAL GROUND ELEVATIONS @ CENTERLINE	EX. SANITARY	PROP. SANITARY
2+975	910.13		
2+980	910.54		
2+985	910.64		
2+990	910.70		
2+995	910.29		
2+995	909.87		

CHAINAGE	ORIGINAL GROUND ELEVATIONS @ CENTERLINE	EX. SANITARY	PROP. SANITARY
2+995	909.59		
2+995	909.87		
2+995	909.70		
2+995	909.64		
2+995	909.84		
2+995	909.85		
2+995	909.92		
2+995	909.83		
2+995	909.68		
2+995	909.50		
2+995	909.35		
2+995	909.19		

DATE: 2023-04-06 14:09 FILE: C:\Users\jguyard\OneDrive - Edson\Documents\2023\11020400\11020400_SANITARY CAPITAL PLAN & PROFILE.dwg

THE DRAWINGS AND DESIGN ARE THE PROPERTY OF THE ENGINEER OR ARCHITECT. NO PART OF THESE DRAWINGS, EITHER WHOLLY OR IN PART, MAY BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER OR ARCHITECT. THE ENGINEER OR ARCHITECT SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING CONSEQUENTIAL DAMAGES, ARISING FROM THE USE OF THESE DRAWINGS OR THE WORK THEREUNDER, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. THE USER OF THESE DRAWINGS SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR THE ACCURACY OF ALL INFORMATION PROVIDED TO THE ENGINEER OR ARCHITECT. THE ENGINEER OR ARCHITECT SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE OR INJURY TO PERSONS OR PROPERTY, OR FOR ANY LOSS OF PROFITS, ARISING FROM THE USE OF THESE DRAWINGS OR THE WORK THEREUNDER, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



Unit 201
 15455 114 Avenue
 Edmonton AB
 Canada T6M 2E2
 Tel: 780.599.3200

PRELIMINARY
 FOR DISCUSSION PURPOSES ONLY

TOWN OF EDSON
 605 - 50 STREET, EDSON, ALBERTA, T5E 1T7
SANITARY CAPITAL PLAN
6 AVENUE - PLAN AND PROFILE
 STA. 2+290 TO STA. 2+580
 EDSON, ALBERTA

Drawing No. **C201**
 Project Number 3231-11020-00
 Rev. A

Rev.	Date	Description	GM	JA	GS
A	2023-10-20	ISSUED FOR REVIEW	GM	JA	GS

ORIGINAL DWG SIZE: A4 (8.27" x 11.69")

Permit Approved Sealed

DESIGN ALL PARTS BEARING PREVIOUS REV. MARK

**APPROVAL SUBJECT TO
CONDITIONS STATED ON**

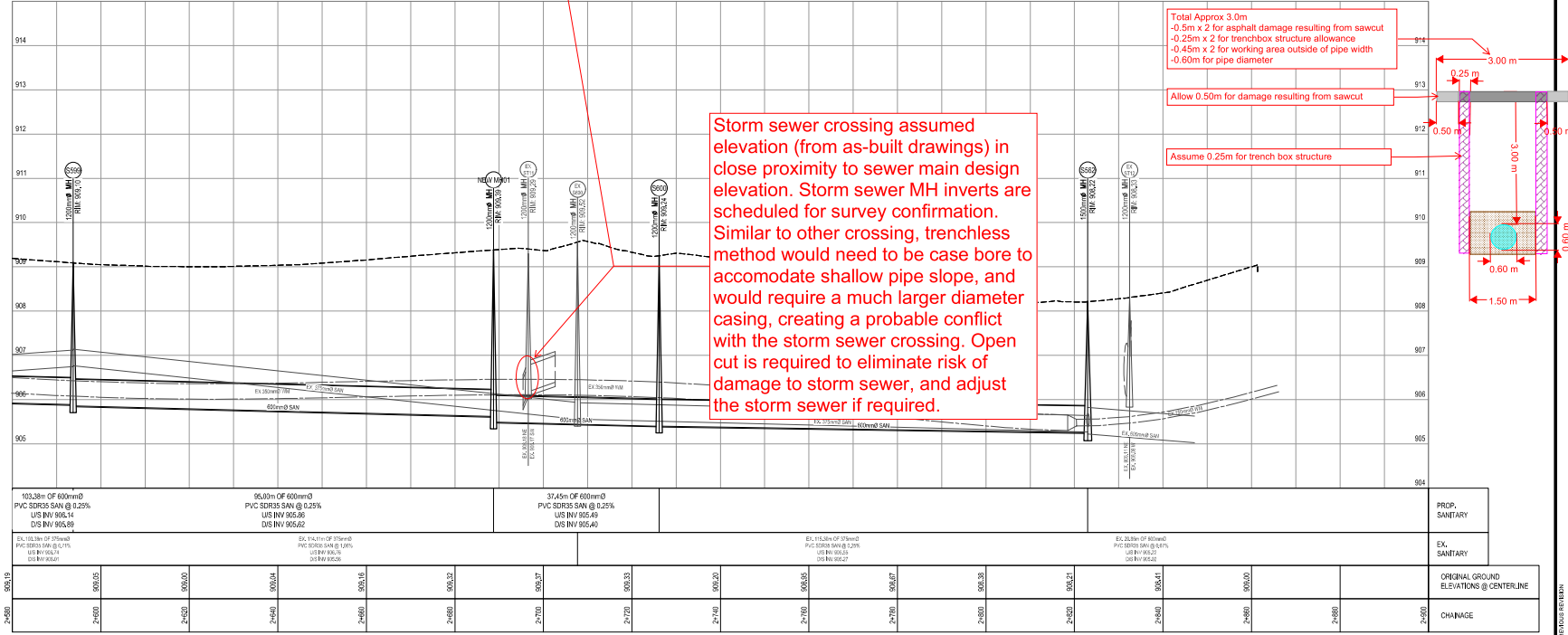
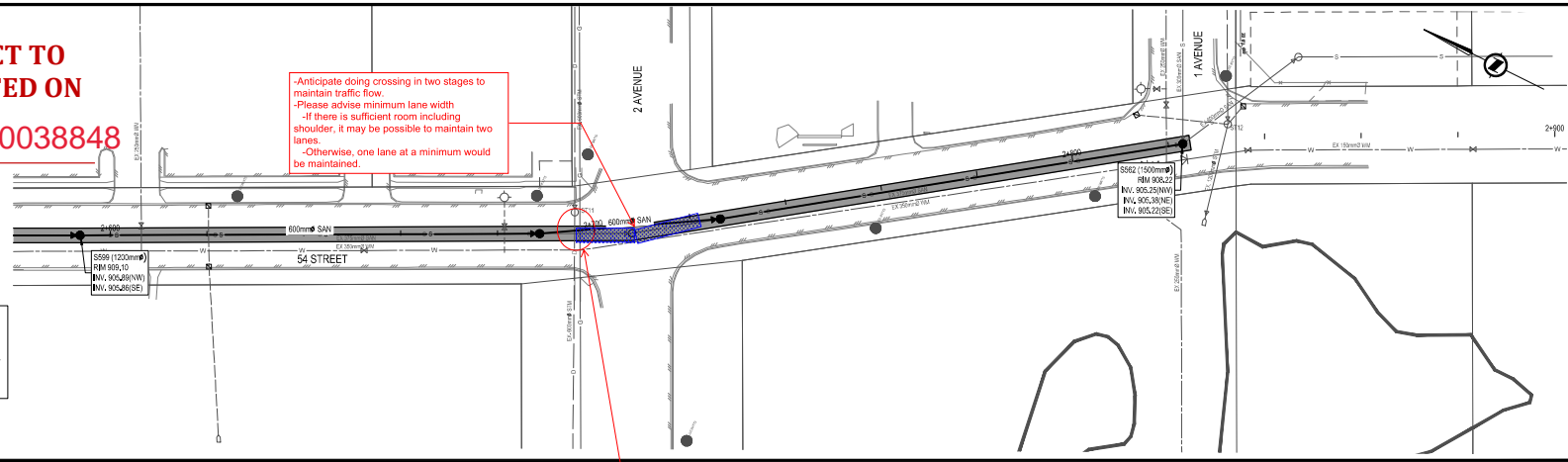
PERMIT No. 2023-0038848

-Anticipate doing crossing in two stages to maintain traffic flow.
-Please advise minimum lane width.
-If there is sufficient room including shoulder, it may be possible to maintain two lanes.
-Otherwise, one lane at a minimum would be maintained.

- GENERAL NOTES:**
1. ALL DISTANCE AND ELEVATIONS ARE SHOWN IN METRES AND DECIMALS THEREOF UNLESS NOTED OTHERWISE. ELEVATIONS ARE GROUND LEVEL UNLESS OTHERWISE NOTED. ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CGRS89PP.
 2. ALL SERVICE CONNECTIONS (WM & SAN) ASSUMED AS COPPER OR PVC UNLESS OTHERWISE INDICATED AND LOCATIONS TO BE VERIFIED BY CONTRACTOR PRIOR TO EXCAVATION.

UTILITY LOCATES

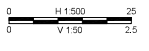
NO RESPONSIBILITY IS ASSUMED BY THE ENGINEER/LANDSCAPE ARCHITECT AS TO THE LOCATION AND DEPTH OF ANY UTILITY. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE AND LOCATION OF ALL UTILITIES THAT MAY BE IMPACTED AND MUST CONDUCT THE NECESSARY UTILITY LOCATES PRIOR TO THE BEGINNING OF ANY OPERATIONS. PROVIDE ENGINEER/LANDSCAPE ARCHITECT WITH COPY OF ALL LOCATE REPORTS.



Station	Pipe Diameter	Material	Invert Elevation	Outlet Elevation	Length (m)	Notes
2+500	103.38m OF 600mmØ	PVC SDR35 SAN @ 0.25%	US INV 908.14 DS INV 905.68		103.38	PRCP. SANITARY
2+500	56.00m OF 600mmØ	PVC SDR35 SAN @ 0.25%	US INV 905.86 DS INV 905.62		56.00	EX. SANITARY
2+500	33.45m OF 600mmØ	PVC SDR35 SAN @ 0.25%	US INV 905.49 DS INV 905.40		33.45	PRCP. SANITARY
2+500	24.900	600mmØ SAN		908.00	24.90	CHANGNE

DATE: 2023-04-10 10:00 FILE: C:\311\2023\0038848\DWG\002 SAN MAIN PLAN.dwg User: J.EDSON

THE DRAWING AND DESIGN IS THE PROPERTY OF ENGINEERING CONSULTANTS AND DESIGNERS. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. ANY REUSE OR REPRODUCTION OF THIS DRAWING WITHOUT THE WRITTEN PERMISSION OF ENGINEERING CONSULTANTS AND DESIGNERS IS STRICTLY PROHIBITED. THE CLIENT AGREES TO HOLD ENGINEERING CONSULTANTS AND DESIGNERS HARMLESS FROM AND AGAINST ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING REASONABLE ATTORNEY'S FEES, ARISING OUT OF OR RESULTING FROM THE USE OF THIS DRAWING BY ANY THIRD PARTY. ENGINEERING CONSULTANTS AND DESIGNERS ACCEPT NO LIABILITY FOR ANY DAMAGE TO PERSONS OR PROPERTY, INCLUDING REAL PROPERTY, ARISING OUT OF OR RESULTING FROM THE USE OF THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AUTHORITIES.



Unit 201
15455 114 Avenue
Edmonton AB
Canada T6M 2E2
Tel 780 850 3300

PRELIMINARY
FOR DISCUSSION PURPOSES ONLY

TOWN OF EDSON
605-50 STREET, EDSON, ALBERTA, T5E 1T7
SANITARY CAPITAL PLAN
6 AVENUE - PLAN AND PROFILE
STA. 2+580 TO STA. 2+900
EDSON, ALBERTA

Drawing No. **C202**
Project Number 3231-11020-00
Rev. A

Rev	Date	Description	GM	JA	GH
A	2023-10-20	ISSUED FOR REVIEW			

REVISIONS SHALL BE PRINTED IN RED IN PREVIOUS EDITIONS