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Iqaluit

REQUEST FOR TENDER

FOR THE PROVISION OF CONSTRUCTION SERVICES FOR

NIPISA AND QEW CULVERT REPLACEMENTS

BID CALL: October 5, 2026

BIDS DUE: October 28, 2026 – 3:00 PM EST

PROJECT NO. IQA0067-26

RFT NO. 2026-RFT-015

SECTION A – TENDER CALL

1. INTRODUCTION

1.1 The City of Iqaluit Department of Public Works and Engineering (the City) is issuing a Request for Tender (RFT) for qualified Proponents to provide construction services as further outlined in this RFT document. The purpose and objective of this project is to replace the existing culvert crossing at Nipisa Street and Queen Elizabeth II Way, including removal and disposal of the existing culvert, excavation, bedding preparation, installation of the new culvert, backfilling, embankment reconstruction, ditch/channel restoration, and erosion and sediment control. The project also includes replacement of the affected sanitary sewer and watermain infrastructure within the project limits, including removal of existing pipes, installation of new sewer and watermain, fittings, valves, service reconnections where required, testing, flushing, and disinfection of the watermain. Associated works include roadway reinstatement with granular base/subbase, compaction, grading, driveway or access tie-ins where impacted, removal and installation/reinstatement of guiderail, traffic control, temporary water management, utility coordination, construction staging, and all related works necessary to complete the culvert, sewer, watermain, roadway, and roadside safety improvements.

2. BACKGROUND

2.1 Location

Iqaluit is the capital of Nunavut and is located at the south end of Baffin Island, Frobisher Bay 64°31’N latitude and 68°31'W longitude. Access to Iqaluit is provided by regular scheduled commercial aircraft year-round, snowmobile trails from other Baffin Island communities in the winter, and sealift from the port of Montreal in the summer.

2.2 Geology and Terrain

Iqaluit‘s location is above the tree line and within the continuous permafrost zone of Canada. The region generally consists of glacially scoured igneous/metamorphic terrain. In some locations, a thin layer of organic material is found.

2.3 Climate

Iqaluit has an Arctic climate with January and July high and low mean temperatures of –21.5° C/ -29.7°C (high/low) and 11.4° C/3.7° C (high/low) respectively. The annual precipitation is made up of 19.2 cm of rainfall and 255.0 cm of snowfall. The prevailing winds are northwest at 16.7 km/hr.

3. TENDER CALL

3.1 Proponents must submit their Tenders by electronic bid submission only, through MERX Canadian Public Tenders. MERX can be accessed via the following website link – https://www.merx.com/. Tenders must address tenders to:

City of Iqaluit

Att: Kevin Kerr
Director of Engineering and Capital Projects
1549 Sivumigiaq Street
Iqaluit, Nunavut, X0A 3H0

3.2 Tenders are required to conform to the conditions below. For further instructions on how to submit an electronic bid through MERX, refer to the MERX Electronic Bid Supplier Guide,

via the following link – https://marketing.merx.com/Support/EBSGuide.pdf. Alternatively, you can contact MERX customer service at 1-800-964-6379.

3.3 Bidders must obtain a unique PIN number from MERX in order to upload electronic bid submission documents. It is important to keep this PIN number in a permanent location as it will be required each time you wish to submit a bid response to a call to tender.

3.4 Electronic Tenders are to be received before **October 28, 2026 – 3:00 PM EST**.

3.5 The final decision on whether to accept late Bids is at the City's discretion.

END OF SECTION

SECTION B – TENDER CONDITIONS

1. **SUBMISSION REQUIREMENTS**

1.1 The Tenderer shall complete all documents pertaining to this Contract in ink or in type.

1.2 If the Tenderer is a corporation, an authorized officer of the corporation shall sign and seal the Form of Tender.

1.3 If the Tenderer is a partnership, a minimum of two partners shall sign the Form of Tender and signatures shall be witnessed.

1.4 If the Tenderer is a sole proprietorship, the sole proprietor shall sign the Form of Tender and the signature shall be witnessed.

1.5 The Tenderer shall submit its Tender by the date and time specified in Part I of the Tender.

1.6 The Tenderer shall submit to the City in their complete bid submission:

i. Completed Form of Tender Form, which includes:

a. Appendix A – Consent of Surety.

b. Appendix B – Cost Submission Form.

ii. Bid bond.

Failure to submit the required items identified in (i) and (ii) may present a Major or Minor Irregularity on the bid. Refer to 1.7 and 1.8 on how Major and Minor Irregularities are to be addressed. The City shall be the sole judge of whether or not a Tender contains irregularities.

1.7 Bidders will be automatically disqualified for any Major Irregularities on their bid submission. Major Irregularities are defined as deviations from the competitive procurement process request that affects the price, quality, quantity or delivery, and is material to the award.

1.8 Tender irregularities that are Minor Irregularities will be handled in the first instance by conferring with the Tenderer to seek clarification. Minor Irregularities are defined as deviations from the competitive process request, which affects form, rather than substance. The effect on the price, quality, quantity or delivery is not material to the award. The bidder will be given the opportunity to adjust the irregularity and continue in the process. However, if an unsatisfactory irregularity remains after consulting with the Tenderer, the Tenderer may be disqualified.

1.9 The Tenderer shall submit electronic files through MERX for both their Security Deposit and Consent of Surety, alongside the electronic tender submission.

1.10 The successful Tenderer shall submit to the City the following documents within five (5) business days of the day the City notifies the successful Tenderer that the documentation should be sent to the City:

i. Valid City of Iqaluit Business License.

ii. Form of Tender forms, which include

a. Appendix C – Subcontractors List.

b. Appendix D – Equipment List.

c. Appendix E – Product Suppliers List.

d. Appendix F – Labour & Equipment Rates.

2. INQUIRIES AND AMENDMENTS

2.1 All inquiries concerning this RFT are to be directed by email only to:

Steven Greeley, P.Eng
Dillon Consulting Limited
sgreeley@dillon.ca

Saurabh Dhungana, E.I.T
Dillon Consulting Limited
sdhungana@dillon.ca

Murray Amirault, P.Eng
City of Iqaluit
m.amirault@iqaluit.ca

Oghenerugba Ugboduma, E.I.T
City of Iqaluit
o.ugboduma@iqaluit.ca

The deadline for submitting inquiries is **October 21, 2026 – 5:00 PM EST** local Iqaluit time.

2.2 Written addendums issued as part of this RFT, in response to inquiries, will be posted publicly on the City's website and on MERX. Verbal explanations or instructions will not be binding.

2.3 Tenderers assume all risk of delivery of amendments. Without limiting the foregoing, the City shall not be held liable for any claim, demand or other action should a transmission be interrupted, not received in its entirety, received after the Closing Time, received by another electronic means other than specified through MERX, or for any other reason over which the City does not have control.

3. SECURITY DEPOSIT

3.1 Every submission shall be accompanied by a security deposit payable to the City of Iqaluit, in an amount not less than 10% of the total Tender amount. The security deposit shall be in the form of one of the two following security deposit options and shall be submitted with the tenderer's electronic tender submission:

3.1.1 OPTION #1: A Digital Bid Bond:

i. Tenderers shall submit a copy of the Digital Bid Bond and follow the submission instructions as stated above in Section 1.9.

ii. If Tenderer's are using this option, the Tenderer and the Tenderer's Surety should refer to the digital bonding information on Surety Association of Canada's website. Information at this site includes:

a. A list of third parties that provide online surety digital bond services, such as Mobile Bonds or Xenex. The City does not endorse or promote any third-party digital bond service provider.

b. An Industry Checklist which digital bonds provided should meet.

iii. The Digital Bid Bond shall be digitally verifiable. The results of the digital verification process shall provide a clear and immediate indication that the document received is the true document executed and that the content has not been changed or altered.

iv. All instruction details for performing the digital verification of the bond should be included with the uploaded bond and be clear and concise.

3.1.2 OPTION #2: Scanned Paper Bid Bond / Certified Cheque, Bank Draft, Money Order (PDF Format):

i. Tenderers shall scan and attach a copy of the paper Bid Bond, Certified Cheque, Bank Draft or Money Order and follow the submission instructions as stated above in 1.9. Tenderer's will be required to provide to the City the original Bid Bond, Certified Cheques, Bank Draft, and/or Money Order that were scanned and attached with the tender submission within 72 hours of tender close. Failure to provide the above original document(s) or to enter into a contract may result in the tenderer being barred from future tender opportunities for the City of Iqaluit for an indeterminate period of time

ii. If an alternative Bid Bond is used, it is recommended that tenderer's request either an ink seal from their Surety or that they trace over the embossed seal prior to scanning to allow for the seal to be visible to the City.

3.2 Bid bonds shall be in the name of the City of Iqaluit as oblige and signed and sealed by the Tenderer and by a surety licensed to conduct business as a surety in Nunavut.

3.3 The City shall not pay interest on security deposits.

3.4 Bid bonds shall be Bid Bond Form CCDC Document No. 220, latest edition, effective until sixty (60) business days after the Closing Date.

3.5 Security deposits will be returned after delivery to the City of the required performance bond and labour and material payment bond by the successful Tenderer.

3.6 If the Contract is not awarded, all security deposits will be returned with reasonable promptness after such decision is made by the City.

3.7 After all executed contracts and bonds are received, and the contract award is made, the successful tenderer and the contract value will be posted on the MERX website. After contract award, the bid deposit of the successful tenderer and all tenderers shall be null and void.

4. CONSENT OF SURETY

4.1 Tenderers must submit with the Bid and Bid Bond, a "Consent of Surety," stating that the surety is willing to supply the performance bond and labour and material payment bond as specified.

4.2 A "Consent of Surety" shall be in one of the two following options and shall be submitted with the Tenderer's submission and as instructed above in 1.9.

i. The City's "Consent of Surety" Form provided in Appendix A.

ii. Other "Consent of Surety" Form used by a Surety company and authorized by law to do business in the Territory of Nunavut, and acceptable to the City.

5. PERFORMANCE ASSURANCE

5.1 The accepted Bid shall provide security (by way of bonds or a security deposit) as stated in the Contract Documents.

5.2 The cost of all security shall be included in the Tender prices.

6. ORDER OF PRECEDENCE

6.1 The following order of precedence will apply:

Order of Precedence
Issued Addenda
Service Agreement
Procurement And Contract Requirements
Supplemental Conditions
General Conditions
General Requirements
Terms Of Reference/ Specification
Drawings

7. TERMS AND CONDITIONS

7.1 Submission of a Bid constitutes acknowledgement that the Tenderer has read and agrees to be bound by all the terms and conditions of this RFT.

7.2 The City will not make any payments for the preparation of a response to this RFT. All costs incurred by a Tenderer will be borne by the Tenderer.

7.3 This is not an offer. The City does not, by virtue of this Tender call, commit to an award of a Bid, nor does it limit itself to accepting the lowest price or any Bid submitted, but reserves the right to award this Bid in any manner deemed to be in the City's best interest.

7.4 Tenderers may amend their Bid at any time prior to the closing date time. Tenderers may not amend their Bid after the closing date time.

7.5 The City has the right to cancel this RFT at any time and to reissue it for any reason whatsoever, without incurring any liability and no Tenderer will have any claim against the City as a result of the cancellation or reissuing of the RFT.

7.6 The City will not consider any Bid that is delivered to any address or in any manner other than that provided in Part I Tender Call of this RFT.

7.7 If a contract is to be awarded as a result of this RFT, it will be awarded to the Tenderer whose Bid for each service, in the City's opinion, provides the best potential value to the City and is capable in all respects to perform fully the contract requirements and has the integrity and reliability to assure performance of the contract obligations.

7.8 If the City decides to award a contract based on a submission received in response to this RFT, the Successful Tenderer(s) will be notified of the intent to award in writing, and the subsequent execution of a written agreement shall constitute the making of a Contract. Tenderers will not acquire any legal or equitable rights or privileges whatsoever until a Contract is signed by both parties.

7.9 Any resulting contract will be in the form of the City's standard "City of Iqaluit Services Agreement" and it will contain the relevant provisions of this Request for Tenders, the accepted bid as well as such other terms as may be mutually agreed upon, whether arising from the accepted bid or as a result of any negotiations prior or subsequent thereto. The City reserves the right to negotiate modifications with any Tenderer who has submitted a Bid.

7.10 A copy of the Services Agreement is included in RFT.

7.11 Any amendment made by the City to the Request for Tender will be issued in writing and posted onto the bidding platform in accordance with Section 2.

7.12 The Bid and accompanying documentation submitted by the Tenderers are the property of the City and will not be returned. Bid bonds will be returned to all unsuccessful Tenderers.

7.13 Tenderers must acknowledge receipt of any addenda issued by the City in their Bid on the Section C – Form of Tender document.

7.14 Tenderers shall disclose in their Bid any actual or potential conflicts of interest and/or existing business relationships it may have with the City, its elected or appointed officials or employees. The City may rely on such disclosure.

7.15 Tenderers and their agents will not contact any member of the City Council, City Staff or City Consultants with respect to this RFT, other than the City Representative named in Part I Tender Call, at any time prior to the award of a contract or the cancellation of this RFT.

7.16 If an arithmetical error is identified in the submitted Bid between any individual price and the price extension (e.g. Unit Price x Quantity of Units), the individual price shall govern. The price extension and the total Bid amount will be corrected accordingly.

7.17 For contracts that include multi-phased work which spans more than the current fiscal year, authorization to proceed with work phases that are to be completed in future years is conditional upon approval of capital spending by the City of Iqaluit Council for each future year. Contracts will only be executed for work that has approved funding under the current fiscal budget.

8. VALIDITY OF OFFER

8.1 Bids shall remain open for acceptance for a period of not less than sixty (60) business days from the closing date of this RFT.

9. TENDER INELIGIBILITY

9.1 Bids that are unsigned, improperly executed, submitted to a location or in a manner other than specified in this RFT, incomplete, conditional, illegible, obscure or contain arithmetical errors, additions not called for, reservations, qualifications, erasures, alterations, or irregularities of any kind, or which are otherwise not completed or submitted in strict compliance with the Instructions to Tenderers, may be rejected by the City whether they constitute as a Major or Minor Irregularity.

9.2 Notwithstanding anything to the contrary herein, the City may in its sole discretion elect to retain any such Bid for consideration and may waive any or all of the foregoing, on such terms or conditions as the City may consider appropriate, even if any of the foregoing would otherwise render the Bid null and void and the Bid may be considered in the same manner as Bids that fully conform to the requirements of the Tender Documents without qualification.

10. REVIEW AND ACCEPTANCE OF BID

10.1 Upon receipt of the Bids, the City in its discretion may elect to conduct a post tender meeting with one or more Tenderers to discuss in detail their respective bid submission and such other items as the City may consider appropriate or necessary without invalidating the procurement process.

10.2 Before award of the Contract, the Tenderer may be required to provide specific information with respect to its legal and or financial status.

10.3 The lowest or any tender will not necessarily be accepted.

10.4 Notwithstanding any custom of the trade to the contrary, the City reserves the right to reject the lowest Bid, even if the lowest Bid is a compliant Bid, accept any Bid or part thereof, negotiate any aspect of any Bid, advertise for new Bids, negotiate a contract as the City deems to be most advantageous to the City's interest without incurring any liability, and to award a contract to whomever the City in its sole and absolute discretion deems appropriate and solely in the best interest of the City and no Tenderer will have any claim against the City as a consequence. Unless required otherwise, the City shall not, at any time, be required to disclose any information to the Tenderers regarding the City's consideration and evaluation of Bids.

10.5 Following acceptance by the City, a written Notice of Award will be issued to the successful Tenderer. If the Tenderer fails for any reason to execute and return the Articles of Agreement within seven (7) working days of receipt for signature of the Articles of Agreement from the City, or fails to provide the performance bond and labour and material bond or other security deposit stipulated in GC 11 or to satisfy such other terms and conditions specified hereunder within any period specified, or such extension of time as may be granted by the City, then the City reserves the right to terminate the Tenderer's right to complete the Contract and to award the Contract to whomever the City considers appropriate. The bid bond shall forthwith become payable.

10.6 The City shall not be obligated in any manner to the successful Tenderer whatsoever until the Contract has been awarded and the Contract has been duly executed by the parties.

10.7 If the City receives no Bids satisfactory to the City in its sole discretion, the City reserves the right in its sole discretion to negotiate a contract for the whole or any part of the Work with any one or more persons whatsoever, including any one or more of the Tenderers, or to postpone or cancel this Bid and then issue a new tender, or to cancel or postpone some or all of the Work.

10.8 The City shall not, under any circumstances, be responsible for any costs, expenses, loss, damage or liabilities, whether direct, indirect, consequential or economic in nature, incurred by a Tenderer as a result of, in connection with or incidental to:

i. The tendering of the work;

ii. Costs incurred for the preparation of this Bid;

iii. The acceptance or rejection of any Bid; or

iv. The exercise by the City of its rights under this RFT.

10.9 By participation in the tendering process, the Tenderer on its own behalf and on behalf of all firms, corporations and individuals comprising the Tenderer, agrees that none of the City or its directors, officers, employees, agents and other representatives shall by liable to any Tenderer, or any firm, corporation or individual comprising the Tenderer, including in contract, tort, statutory duty, duty of fairness, duty of care, law, equity or otherwise, for any claims, direct or indirect, whether for costs, expenses, losses or damages, or loss of anticipated profits, or for any matter whatsoever, incurred in preparing and submitting a Bid, or negotiations of a Contract, or in any way arising in connection with the Bid Documents. The Tenderer further agrees on its own behalf and on behalf of all firms, corporations and individuals comprising the Tenderer, that the award of the Contract is in the sole discretion of the City and in no event shall the Tenderer or any firms, corporations or individuals comprising the Tenderer seek injunctive or other relief to prevent or delay the award of the Contract or the performance of any Work or services in relation thereto.

11. UNBALANCED TENDERS

11.1 The Tenderer shall not submit an unbalanced Tender.

11.2 The City shall have the right to:

i. Deem a Tender to be unbalanced; and;

ii. Reject a Tender which may be, in its opinion, unbalanced.

12. COLLUSION

12.1 The Tenderer shall not engage in collusion of any sort and, in particular, shall:

i. Ensure that no person or other legal entity, other than the Tenderer, has any undisclosed interest in the Tenderer's Tender; and

ii. Prepare its Tender without any knowledge of, comparison of figures with or arrangement with any other person or firm preparing a Tender for the same work.

13. RIGHT TO ACCEPT OR REJECT TENDERS

13.1 Notwithstanding any other provision in this Contract, the City shall have the right to:

i. Accept any Tender;

ii. Reject any Tender; and

iii. Reject all Tenders.

13.2 Without limiting the generality of 13.1, the City shall have the right to:

i. Accept an irregular Tender;

ii. Accept a Tender which is not the lowest Tender; and

iii. Reject a Tender even if it is the only Tender received by the City.

13.3 Acceptance of the Tender shall occur at the time the City awards the Tender and not necessarily at the time the award is communicated to the successful Tenderer.

14. CONTRACT DOCUMENTS

14.1 The Tenderer shall obtain and review all Contract Documents as listed in the Form of Tender and all Addenda issued by the City pertaining to this Contract.

15. COMMENCEMENT AND COMPLETION OF WORK

15.1 The Tenderer, in submitting the Bid, agrees that the Tenderer can complete the Work by the date for completion stated in the Tender Form.

16. OMISSIONS, DISCREPANCIES AND INTERPRETATIONS

16.1 Tenderers finding discrepancies or omissions in the drawings or terms of reference or having doubt as to the meaning or intent thereof, shall at once notify the Purchasing Coordinator who will, if necessary, send written instructions or explanations to all Tenderers.

16.2 Oral interpretations made to any Tenderer shall not affect a modification of any provision of the Tender Documents. Only addenda written and issued by the City can be considered.

16.3 The City reserves the right in its sole discretion at any time, and for whatever reason to, by Addendum, modify, amend or otherwise change the Tender Documents. Any such Addendum shall be issued in writing and shall be expressly identified as an Addendum to these Tender Documents. All such changes shall become part of the Tender Documents and their effects shall be reflected in the Tender prices. The City also reserves the right in its sole discretion to cancel this Tender at any time.

17. IRREVOCABILITY OF OFFER

17.1 The Tenderer shall not revoke its offer until after the expiration of sixty (60) business days after the opening of Tenders by the City.

17.2 If the Tenderer revokes its offer prior to the expiration of sixty (60) business days after the Tender opening, the Tenderer shall forfeit its Tender security deposit, but this shall not prohibit the City from pursuing and other legal remedy which it may have.

18. ALTERNATIVES & EQUALS

18.1 Where requested in this RFT, Tenderers may propose alternatives or equals to the stated scope of work. In case alternate or equals are requested in this RFT, the following will apply:

i. Where the Tender Documents stipulate a particular product, alternatives or equals will be considered by the City up to ten (10) calendar days prior to the Closing Time.

ii. When a request to substitute an allegedly equal product is made to the City, the City may approve the substitution either as an equal or as an alternative and will issue an Addendum to all Tenderers. If a product is approved as equal, all Tenderers may use that product in place of the specified product. If the product is approved as an alternative, Tenderers shall base their prices upon the specified product and shall indicate in the Bid the change in price which will apply if use of the alternative product is allowed.

iii. In their submission of alternatives to products specified, Tenderers shall include and allow for any changes required in the Work to accommodate such alternative products. A later claim by the Contractor for an addition to the Contract Price because of changes in the Work necessitated by use of alternative products shall not be considered.

iv. Where selected products are stipulated in the Tender Documents the Bid shall be based on the use of only these selected products.

v. Bids with alternative products will not be considered, unless the alternative has been approved by the City and communicated to the Bidders through an Addendum as noted in 18.1(ii). Bids with alternatives that have not been approved by the City will be deemed non-compliant.

vi. Submissions shall provide sufficient information to enable the City to determine the acceptability of such products.

vii. Provide complete information on required revisions to other work and products to accommodate each alternative product, and the amount of addition or reduction from Tender prices, including required revisions, for each alternative product.

viii. Unless a bid for an alternative product is submitted in this manner and later accepted, provide the product specified.

19. PUBLIC OPENING

19.1 A public opening of bids will be completed for this competition.

19.2 The public opening of bids will occur immediately following the closing time stipulated in section 27.4.

19.3 A public opening will be conducted virtually via conference call. Meeting details will be provided in an addendum.

20. TENDER SIGNING

20.1 The Bid must be executed under seal by the Tenderer.

20.2 If the Tenderer is an individual or a partnership, the Bid shall be executed by the individual or a partner in the presence of a witness and the signatory must show the capacity in which he or she signs (e.g.: “Partner” or “Proprietor”).

20.3 If the Tenderer is a corporation, the Bid shall be executed under the seal of the company, affixed in the presence of the authorized officers or two directors.

20.4 If the Tenderer is a joint venture, each party to the joint venture shall execute the Bid under seal in the manner appropriate to such party.

21. APPENDICES TO FORM OF TENDER

21.1 Tenderers shall complete all Appendices attached to the Form of Tender and submit these with the Tender.

22. PROVISIONAL ITEMS

22.1 Provisional items shall mean items for which only very approximate quantities have been included in the tender documents. No work for which "Provisional" items are allowed shall be commenced without written instructions from the City.

22.2 Once a Tenderer has been chosen by the City for the Project, it shall be open to the City to accept, reject or negotiate the Tenderer's bid for any provisional item contained in the Bid. Should the City choose to reject the successful Tenderer's bid for such provisional work, it shall be open to the City to call for new Bids for this work and the successful Tenderer for the Project may submit a Bid if he so chooses.

23. SUCCESSFUL TENDERER – BONDS

23.1 The successful Tenderer and its surety shall provide:

i. A performance bond signed and sealed by the Tenderer's surety; and

ii. A labour and material payment bond signed and sealed by the Tenderer's surety;

Each in the amount of at least fifty percent (50%) of the total Tender price. The cost of Bonds shall be included in the Tender price.

23.2 The surety of the successful Tenderer and the bonds referred to in 23.1 must be originals and shall be to the satisfaction of the City.

24. SUCCESSFUL TENDERER – WORKERS' SAFETY AND COMPENSATION COMMISSION CERTIFICATE OF CLEARANCE

24.1 The successful Tenderer shall provide the City with a valid Workers' Safety and Compensation Commission Certificate of Clearance to the satisfaction of the City.

25. SUCCESSFUL TENDERER – EXECUTION OF ARTICLES OF AGREEMENT

25.1 The successful Tenderer shall execute in accordance with Section 1, in triplicate, the Articles of Agreement provided in the Contract Documents.

25.2 The successful Tenderer shall forward the executed Articles of Agreement to the City.

26. SUCCESSFUL TENDERER – INSURANCE

26.1 The successful Tenderer shall provide the City with an original Certificate of Insurance for each type of insurance coverage required by GC12.3 and any additional coverage specified in the Supplementary Conditions.

26.2 The Contractor shall carry insurance in the amount of at least Two Million Dollars ($2,000,000)

26.3 The Contractor shall carry insurance, which names the following as additional insureds:

	Address
City of Iqaluit	100-1085 Mivvik Street Iqaluit, Nunavut, X0A 3H0
Dillon Consultant Limited	334-11th Avenue SE Suite 200 Calgary, Alberta, T2G 0Y2

27. SUCCESSFUL TENDERER – TIME FOR COMPLETION

27.1 The successful Tenderer shall Substantially Perform the work by November 26, 2027 and this shall be the first date for the calculation of Liquidated Damages per Section 28.

27.2 The successful Tenderer shall Complete the Work by December 10, 2027 and this shall be the second date used for the calculation of Liquidated Damages as per Section 28.

27.3 The successful Tenderer acknowledges that time shall be deemed to be of the essence of the Contract. For the Tenderer's purpose of establishing a scheduled for the Work, it is anticipated that the Contract Award will be complete 30 calendar days after the opening of Tenders by the City, and then the Commence Work Order will be issued 3 business days after the Contract Award is complete. Milestone dates associated with the Contract will be adjusted, when possible, due to any delays caused by the City during the Contract Award and/or issuance of the Commence Work Order.

27.4 The Contract general timelines have been identified below.

ACTION	DATE
Opening/Bid Call Date for RFT	October 5, 2026
Deadline for Submitting Inquiries	October 21, 2026 – 5:00 PM EST
Closing Date for RFT	October 28, 2026 – 3:00 PM EST
Public Opening Date	October 28, 2026 – 3:30 PM EST **Microsoft Teams meeting** **Join:** PUBLIC OPENING : 2026-RFT-015 NIPISA AND QEW CULVERT REPLACEMENTS Meeting ID: 224 235 812 195 978 Passcode: bn2Ek9pk
Approvals	November 18, 2026
Contract Award Date	November 25, 2026
Commence Work Date	June 4, 2027
Project Kick-Off Date	June 7, 2027
Substantial Performance Date	November 26, 2027
Warranty Start Date	December 10, 2027
Warranty End Date	December 10, 2028

28. SUCCESSFUL TENDERER – LIQUIDATED DAMAGES

28.1 Liquidated damages shall be in the amount of:

TWO THOUSAND DOLLARS ($2000) per calendar day beyond the Substantial and Completion Dates, as determined in Section 27.

29. **SUCCESSFUL TENDERER – SUBMISSION OF DOCUMENTATION**

29.1 The successful Tenderer shall submit the documentation required in 1.1.10 within five (5) business days of the day the City notifies the successful Tenderer that the documentation should be sent to the City.

29.2 If the successful Tenderer fails to comply with 29.1 the City may, in its sole discretion, withdraw its acceptance of the Tender and the Tenderer shall have no recourse whatsoever against the City.

30. **SUCCESSFUL TENDERER – COMMENCEMENT OF THE WORK**

30.1 The successful Tenderer shall not commence the Work until it has received a Commence Work Order issued by the City.

END OF SECTION

SECTION C – FORM OF TENDER

Date: _____

Submitted By: Name: _____

Address: _____

_____

Telephone: _____

To: **City of Iqaluit**
City Hall
Iqaluit, Nunavut

Project: **Project Title: Nipisa and QEW Culvert Replacements**
RFT Number: 2026-RFT-015

The undersigned Tenderer, having carefully examined the Tender Documents and the Site, and having full knowledge of the Work and of the materials and products to be furnished and used, hereby agrees to provide all necessary materials, products, supervision, labour and equipment and perform and complete all Work and fulfill everything for the stipulated lump sum price of:

_____

(Total in Words)

_____ Dollars $ _____

in Canadian funds, which price includes all specified cash and contingency allowances and the applicable taxes in force at this date excluding GST.

We have included herewith the security deposit and Consent of Surety as required by the Instructions to Tenderers.

The undersigned also agrees:

1. That the provisions of the Instruction to Tenderers apply, including without limitation provisions that provide that City is in no way obligated to accept this Bid, the City may at its sole discretion to accept any Tender or part thereof or waive any defect, irregularity, mistake or insufficiency and accept any Tender or alternative bid, in whole or in part, which is deemed by the City to be most favourable to its interest, and that limit the City's liability.
2. That the estimate of quantities shown in Tender Documents serves only to provide a basis for comparing Bids and that no representations have been made by either the City or their

Agent that the actual quantities correspond therewith, and further, that the City has the right to increase or decrease the quantities in any or all items and to eliminate items entirely from the Work.

3. That this Bid is made without knowledge of the Bid prices to be submitted for the Work by any other company, firm or person.

4. That this Bid is made without connection or arrangement with any company, firm or person submitting a bid for the Work.

5. That this Bid is made without any undisclosed connection or arrangement with any other company, firm, or person having an interest in this Bid or in the proposed contract.

6. That this Bid is irrevocable for sixty (60) business days after the Closing Time and that the City may at any time within such period accept this Bid whether any other contract has previously been awarded or not and whether acceptance of another Bid has been given or not.

7. If this Bid is accepted by the City, to execute the Articles of Agreement and to present to the City the required security (by way of bonds or a security deposit) as stated in the General Conditions within seven (7) calendar days after the date of Notice of Award.

8. If this Bid is accepted within the time stated herein, and we fail to execute the Articles of Agreement and provide the required Bonds or security deposit, or we request to withdraw, the security deposit provided with the Bid shall be forfeited as damages to the City by reason of our failure, limited in amount to the lesser of the face value of the deposit or the difference between this Bid and the price the Contract is signed.

9. In the event our Bid is NOT accepted within the time stated herein the required security deposit shall be returned to the undersigned in accordance with the provisions in the Instructions to Bidders, unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

10. That payment for the Work done will be made on the basis of the quantities measured by the City or its Agent and at the Bid prices shown in the Tender Form which shall be compensation in full for the Work done under the terms of the Contract.

11. That payment of the contingency allowance or portion thereof will only be made in the event that the City or its Agent authorizes work, in which case the amount of payment will be determined as specified in the General Conditions. Any unused portion thereof will be retained by the City.

12. To commence and proceed actively with the Work on Site within seven (7) business days of the date of the execution of the contract, and to substantially perform the Work as identified under subclause 27.4 subject to the provisions of Section 6 of the General Conditions for extension of the Contract Time.

13. That should the undersigned fail to complete the Work in the time specified above, he shall compensate the City of Iqaluit in accordance with GC 6 of the General Conditions.

14. That the undersigned has carefully examined the Work described herein, has become familiar with local conditions and the character and extent of the Work, has carefully examined every part of the proposed contract and thoroughly understands its terms and conditions, has determined the source of supply and transport of the materials required, has investigated labour conditions and has arranged for the continuous performance of the Work described in the Tender Documents.

15. **Appendices**

15.1 Appendix A – Consent of Surety

15.2 Appendix B – Cost Submission Form

15.3 Appendix C – List of Subcontractors

15.4 Appendix D – List of Equipment

15.5 Appendix E – List of Product Suppliers

15.6 Appendix F – Labour and Equipment Rates

16. **Addenda**

16.1 The following Addenda have been received. The modifications to the Tender Documents noted therein have been considered and the effects are included in the Tender prices.

Addendum #:		Date:	
Addendum #:		Date:	
Addendum #:		Date:	
Addendum #:		Date:	
Addendum #:		Date:	
Addendum #:		Date:	
Addendum #:		Date:	

This Tender is executed under seal at _____ this _____day of _____ 2026.

Name of Firm: _____

Address: _____

FOR INDIVIDUAL OR PARTNERSHIP:

SIGNED, SEALED AND DELIVERED by:

_____ _____ (Seal)
(Tenderer – Please Print) (Signature of Tenderer)

In the presence of:

_____
(Witness – Signature)

Name: _____

Address: _____

_____

Occupation: _____

FOR LIMITED COMPANY:

The Corporate Seal of:

_____ (Seal)
(Tenderer – Please Print)

Was hereunto affixed in the presence of:

_____
Authorized Signing Officer and Title

_____
Authorized Signing Officer and Title

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.

END OF SECTION

APPENDIX A – CONSENT OF SURETY

Herewith is the Consent of Surety of the Tender submitted.

By: _____

To: The City of Iqaluit

Dated: _____ 2026 and which is an integral part of the Tender

CONSENT OF SURETY COMPANY

Should it be required, the undersigned Surety Company hereby consents and agrees with the City to become bound as Surety in all performance bonds and labour and material payment bonds required by the Tender Documents, all for the fulfillment of the Contract for the Work covered by the annexed Tender, which may be awarded to:

_____
(Name of Tenderer)

_____
(Address)

At prices set forth in the attached Tender. The said Surety is legally entitled to do business in Nunavut.

The Corporate Seal of:

_____
(Surety – Please Print)

Was hereunto affixed in the presence of:

_____
(Authorized Signing Officer) Title

_____
(Authorized Signing Officer) Title

END OF SECTION

APPENDIX B – COST SUBMISSION FORM

Date: _____

Project Name: **Nipisa and QEW Culvert Replacements**

I/We, _____
(Company Name)

Of _____
(Business Address)

have fully inspected the Site and examined all the conditions affecting the Work. I/we have also carefully examined all documents prepared for this Contract including Addenda thereto; and hereby offer to furnish all labour, materials, plant, equipment and services for the proper execution and completion of the items listed below, in accordance with the Contract Documents, including all Addenda thereto which arJe acknowledged hereinafter for the above project for the sums separately indicated as follows:

Item	Description	Qty	Unit	Unit Price	Total(CAD$)
Nipisa Street					
1.	Mobilization & demobilization incl. permits & site set up	L.S.	1	$	$
2.	Traffic Control, Project Signage and Safety Setup	L.S.	1	$	$
3.	Utility Pole/ Guy Wire Support During Construction	L.S.	1	$	$
4.	Re-instatement of Existing Driveways, Paths, Access Roads	L.S.	1	$	$
5.	Allowances				
	a. Third party testing (Sieve Analysis, Compaction Testing, Concrete Testing and Asphalt Testing)	L.S.	1	$16,000	$
6.	Common Excavation	m^3	515	$	$
7.	Rock Excavation	m^3	10	$	$

8.	Removals and disposal off-site.				
	a. Asphalt	m^2	126	$	$
	b. Culvert - 1200mm Dia Round CSP	m	45	$	$
	c. Locate cut, cap and remove water and sewer main 16 meters each.	M	32	$	$
	d. Existing Gabion Baskets	m	10	$	$
	e. Existing Steel Fence	m	20	$	$
9.	Culvert installation with excavation and disposal of unsuitable material and backfilling with compaction of suitable material as identified in the drawings.				
	a. 4800x1250 Pre-Cast Concrete Box Culvert	L.S.	1	$	$
	b. 200mm Minus Cobble	m^3	45	$	$
	c. 100mm Minus around the drainpipe	m^3	18	$	$
	d. Nonwoven Geotextile	m^2	90	$	$
	e. 25mm Washed Stone	m^3	35	$	$
	f. 150mm Perforated Pipe	m	45	$	$
10.	Gabion Baskets with excavation and disposal of unsuitable material and backfilling with compaction of suitable material as identified in the drawings.				
	a. 2m x 1m x 1m				
	i. Supply and Deliver	ea.	14	$	$
	ii. Install	ea.	14	$	$
	b. 1.5m x1m x1m				
	i. 1.5m x 1m x 1m – Supply and Deliver	ea.	14	$	$

	ii. 1.5m x1m x1m – Install	ea.	14	$	$
	c. Non woven Geotextile	m^2	63	$	$
11.	Divert Stream Channel To Work In Dry	L.S.	1	$	$
12.	Roadway and Shoulder				
	a. Granular 'A'	m^3	44	$	$
	b. Granular 'B'	m^3	52	$	$
	c. Supply and Install Guide Rails, including End treatments	m	42	$	$
13.	Piping				
	a. Maintain Existing Water Main In Service During Construction	L.S	1	$	$
	b. Maintain Existing Sanitary Sewer In Service During Construction	L.S	1	$	$
	c. Supply and install 2 10m length 450mm HDPE carrier pipe	m	20	$	$
	d. Supply and Install 200mm HDPE Water Main	m	16	$	$
	e. Supply and Install 200mm HDPE Sanitary Sewer	m	16	$	$
	f. Supply and Install Coupling for Water and Sanitary Connection	Ea.	4	$	$
14.	Supply and Install Concrete Grade Beam c/w 50mm Void Form and Connections to Concrete Box Culvert and Adfreeze Steel	m	30	$	$
15.	Supply and installation of Steel Piles	LS	1	$	$
Subtotal Nipisa Culvert					
<u>Queen Elizabeth II Way</u>					
1.	Mobilization & demobilization incl. permits & site set up	L.S.	1	$	$
2.	Traffic Control, Project Signage and Safety Setup	L.S.	1	$	$

3.	Utility Pole/ Guy Wire Support During Construction	L.S.	1	$	$
4.	Re-instatement of Existing Driveways, Paths, Access Roads	L.S.	1	$	$
5.	Allowances				
	Third-party testing (Sieve Analysis, Compaction Testing, Concrete Testing	L.S.	1	$16000	$
6.	Common Excavation and disposal off-site at the city-specified location.	m^3	1373	$	$
7.	Rock Excavation and disposal off-site at the city-specified location.	m^3	10	$	$
8.	Removals and disposal off-site.				
	a. Asphalt	m^2	120	$	$
	b. Culverts				
	i. 1600mmx1100mm Pipe-Arch CSP	m	102	$	$
	ii. 600mm Dia Round CSP	m	67	$	$
	c. Locate cut, cap, and remove water main and sewer main 18 meters	m	36	$	$
	d. Existing Gabion Baskets	m	36	$	$
	e. Existing Bollard	Ea.	1	$	$
9.	Culverts with excavation and disposal of unsuitable material and backfilling with compaction of suitable material as identified in the drawings.				
	a. 4500x1500 Pre-Cast Concrete Box Culvert	L.S	1	$	$
	b. 200mm Cobble	m^3	80	$	$
	c. 100mm Minus around the drain pipe	m^3	44	$	$
	d. Nonwoven Geotextile	m^2	204	$	$
	e. 25mm Washed Stone	m^3	77	$	$

	f. 150mm Perforated Pipe	m	88	$	$
10.	Gabion Baskets with excavation and disposal of unsuitable material and backfilling with compaction of suitable material as identified in the drawings.				
	a. 2m x 1m x 1m				
	i. Supply and Deliver	ea.	9	$	$
	ii. Install	ea.	9	$	$
	b. 1.5m x 1m x 1m				
	i. Supply and Deliver	ea.	9	$	$
	ii. Install	ea.	9	$	$
	c. 1m x 1m x 1m				
	i. Supply and Deliver	ea.	16	$	$
	ii. Install	ea.	16	$	$
	d. 1m x 1m x0.5 m				
	i. Supply and Deliver	ea.	7	$	$
	ii. Install	ea.	7	$	$
	e. Nonwoven Geotextile	m^2	78	$	$
11.	Divert Stream Channel To Work In Dry	L.S.	1	$	$
12.	Roadway				
	a. Granular 'A'	m^3	45	$	$
	b. Granular 'B'	m^3	68	$	$
	c. Guide Rails	m	67	$	$

13.	Piping				
	a. Maintain Existing Water Main In Service During Construction	L.S	1	$	$
	b. Maintain Existing Sanitary Sewer In Service During Construction	L.S	1	$	$
	c. 150mm HDPE End Cap	Ea.	2	$	$
14.	Supply and Install Concrete Grade Beam c/w 50mm Void Form and Connections to Concrete Box Culvert and Adfreeze Steel	m	68	$	$
15.	Steel Piles	LS	1	$	$
Sub-Total Queen Elezabeth II Way					$
GST:					**$**
TOTAL:					**$**
					$

END OF SECTION

APPENDIX C – LIST OF SUBCONTRACTORS

Re: Bid for **Nipisa and QEW Culvert Replacements**

1. This List of Subcontractors Form is acknowledged and agreed to form an integral part of the Bid for:

   Nipisa and QEW Culvert Replacements

2. The Subcontractors listed below will remain unchanged and will be used to perform the work of the trade section indicated, unless the Owner gives written permission to change one or more of the Subcontractors. Where subcontractors are not intended to be used for the work of the trade section indicated, the term “By Own Forces” is inserted.

3. Each Subcontractor listed below has been consulted and is fully acquainted with the extent and nature of the Work, the contract conditions and requirements, the proposed construction schedule, and has agreed to execute the Work in accordance with the terms of the Contract and for the Bid Price amount shown.

TRADE SECTION (INSERT SCOPE SECTION/DISCIPLINE)	**SUBCONTRACTOR COMPANY NAME**

END OF SECTION

APPENDIX D – LIST OF EQUIPMENT

Re: Bid for **Nipisa and QEW Culvert Replacements**

1. This List of Equipment Form is acknowledged and agreed to form an integral part of the Bid for:

   Nipisa and QEW Culvert Replacements

EQUIPMENT	SIZE	MAKE	MODEL

END OF SECTION

APPENDIX E – PRODUCT SUPPLIERS

Re: Bid for **Nipisa and QEW Culvert Replacements**

1. This List of Product Suppliers Form is acknowledged and agreed to form an integral part of the Bid for:

   Nipisa and QEW Culvert Replacements

PRODUCT	PRODUCT SUPPLIER	MANUFACTURER
Culverts		
Culvert Markers		
Geogrid		
Granular Material		
Couplings		
Other Specify		

END OF SECTION

APPENDIX F – LABOUR AND EQUIPMENT RATES

Re: Bid for **Nipisa and QEW Culvert Replacements**

1. This List of Product Suppliers Form is acknowledged and agreed to form an integral part of the Bid for:

   Nipisa and QEW Culvert Replacements

2. The rates listed below will remain unchanged and will be used to measure payment for additional work, not include in the Contract Documents.

POSITION	RATE(CAD$)
Superintendent	
Supervisor/Foreperson	
Skilled Laborer	
General Laborer	
Operator	
Surveyor	
Other	

EQUIPMENT	RATE(CAD$)

END OF SECTION

SECTION D – ARTICLES OF AGREEMENT

THIS AGREEMENT MADE IN DUPLICATE THIS _____ DAY OF _____ 2026

BETWEEN:

THE CITY OF IQALUIT

("the City")

-and-

_____

("the Contractor")

ARTICLES OF AGREEMENT

IN CONSIDERATION of the mutual promises and obligations contained in the Contract Documents, the City and the Contractor agree as follows:

A.1 CONTRACT DOCUMENTS

1.1 The documents forming the Contract between the City and the Contractor, referred to herein as the Contract Documents shall consist of:

a) these Articles of Agreement;

b) the document attached hereto entitled "General Conditions";

c) the document attached hereto entitled "Supplementary General Conditions";

d) the documents attached hereto entitled "Plans and Specifications";

e) the documents attached hereto entitled "Tender Documents"; and

f) any amendment or variation of the Contract Documents that is made in accordance with the General Conditions.

1.2 The City will designate a representative for the purposes of the Contract.

1.3 In the Contract:

a) "Fixed Price Arrangement" means that part of the Contract that prescribes a lump sum as payment for performance of the Work to which it relates; and

b) "Unit Price Arrangement" means that part of the Contract that prescribes the product of a price multiplied by a number of units of measurement of a class as payment for performance of the Work to which it relates.

1.4 Any of the provisions of the Contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the Work to which a Fixed Price Arrangement is applicable.

1.5 Any of the provisions of the Contract that are expressly stipulated to be applicable only to a Fixed Price Arrangement are not applicable to any part of the Work to which a Unit Price Arrangement is applicable.

A.2 DATE OF COMPLETION OF WORK AND DESCRIPTION OF WORK

2.1 The Contractor shall between the date of these Articles of Agreements and **December 10, 2027** in a careful and workmanlike manner, diligently perform and complete the following Work:

Remove Existing Culverts at Nipisa Street and Queen Elizabeth II Way and Replace with the concrete culverts as detailed in the Contract Documents

A.3 CONTRACT PRICE

3.1 Subject to any increase, decrease, deduction or set-off that may be made under the Contract, the City shall pay the Contractor at the times and in the manner set out or referred to in the General Conditions.

3.1.1 the sum of $ _____ in consideration for the performance of the Work or the part thereof that is subject to a Fixed Price Arrangement, excluding goods and services tax (GST); and

3.2 The Contract Price shall exclude Goods and Services Tax.

A.4 ADDRESSES

4.1 For all purposes of the Contract, the Contractor's address shall be deemed to be:

_____

_____

4.2 For all purposes of the Contract, the City's address shall be deemed to be:

City of Iqaluit
100-1085 Mivvik Street
Iqaluit, Nunavut, X0A 3H0

SIGNED, SEALED AND DELIVERED in the presences of:

CONTRACTOR:

Per: _____ _____
Signature Witness

_____ _____
Name Date

_____
Position

Per: _____ _____
Signature Witness

_____ _____
Name Date

_____
Position

MUNICIPAL CORPORATION OF THE CITY OF IQALUIT

Per: _____ _____
Mayor Date

Per: _____ _____
Chief Administrative Officer Date

END OF SECTION

CITY OF IQALUIT SERVICES AGREEMENT

BETWEEN: THE MUNICIPAL CORPORATION OF THE CITY OF IQALUIT

(hereinafter referred to as the "CITY OF IQALUIT")

OF THE FIRST PART

AND: **<CONTRACTOR NAME>**

(hereinafter referred to as the "Contractor")

OF THE SECOND PART

WHEREAS the CITY OF IQALUIT has requested the Contractor to provide construction services for the <**insert project name/ contract title**>;

AND WHEREAS the Contractor has agreed to provide such services to the CITY OF IQALUIT in its proposal dated **<insert proposal date>**;

AND WHEREAS the CITY OF IQALUIT and the Contractor wish to set out the terms and conditions relating to the provision of such services.

1. SERVICES AND PAYMENT

   1.1 The Contractor agrees to provide to the CITY OF IQALUIT those services set out in the job description and scope of work provided on **<insert bid date> (the "Services")**.

   1.2 The CITY OF IQALUIT agrees to pay for the services described above, a total amount not greater than **<Bid Value>,** for the provision of professional services based on the Bid dated **<Bid Submission Date>**.

2. TERM

   2.1 This Contract shall commence on the <Contract Commence Date> and terminates on the <Contract Termination Date> unless otherwise terminated in accordance with the provisions of this Contract.

3. NOTICE AND ADDRESS

   3.1 Any notice required to be given herein or any other communication required by this contract shall be in writing and shall be personally delivered, sent by facsimile, or posted by prepaid registered mail and shall be addressed as follows:

   i) If, to the CITY OF IQALUIT:

   Steve England
   Chief Administrative Officer
   City of Iqaluit
   100-1085 Mivvik Street
   Iqaluit, Nunavut, X0A 3H0

   Reference:

ii) If to the contractor at:

<Contractor Representative – Name>

<Contractor Organization Name>

<Contractor Address>

3.2 Every such notice and communication, if delivered by hand, shall be deemed to have been received on the date of delivery or if sent by prepaid registered mail shall be deemed to have been received on the seventh day after posting, or if by facsimile, 48 hours after the time of transmission, excluding from the calculation weekends and statutory holidays.

4. COMPLETE AGREEMENT

4.1 This contract and its attachments constitute the complete contract between the parties. Except as provided herein, it supersedes and shall take effect in substitution for all previous agreements. It is subject to change only by an instrument executed in writing by the City.

4.2 If this contract arises from a request for proposals or tender call, the provisions of the request for proposals or tender call and the contractor's bid or proposal submission are incorporated into this contract and may be used to clarify, explain or supplement this contract, but shall not be used to contradict any express terms of this contract.

4.3 In the event of a conflict between this contract, the contractor's bid or proposal submission, and the City's original tender bid instructions, the more recently prepared document shall govern to the extent of such inconsistency.

5. GENERAL TERMS

5.1 Any information obtained from or concerning any department of the CITY OF IQALUIT or clients of any department of the CITY OF IQALUIT, by the contractor, its agents or employees in the performance of any contract shall be confidential. The contractor shall take such steps as are necessary to ensure that any such information is not disclosed to any other person and shall maintain confidential and secure all material and information that is the property of the CITY OF IQALUIT and in the possession of or under the control of the contractor. This clause survives the termination of this contract.

5.2 Time shall in every respect be of the essence. The contractor shall deliver the services specified in the contract and according to the project schedule on costs. The CITY OF IQALUIT may grant reasonable extensions to the contractor for delays, if the contractor can show those delays were caused by circumstances beyond the control of the contractor.

5.3 The contractor is an independent contractor with the CITY OF IQALUIT and nothing in this contract shall be construed or deemed to create the relationship of employee and employer or of principal and agent between the CITY OF IQALUIT and the contractor. The contractor is solely responsible for payments of all statutory deductions or contributions including but not limited to pension plans, unemployment insurance, income tax, workers' compensation and the Nunavut Payroll Tax.

5.4 This contract shall be interpreted and governed in accordance with the laws of Nunavut and the laws of Canada as they apply in Nunavut.

5.5 No waiver by either party of any breach of any term, condition or covenant of this contract shall be effective unless the waiver is in writing and signed by both parties. A waiver,

with respect to a specific breach, shall not affect any rights of the parties relating to other or future breaches.

5.6 The failure of either party at any time to require the performance of any provision or requirement of this contract shall not affect the right of that party to require the subsequent performance of that provision or requirement.

5.7 Title to any report, drawing, photograph, plan, specification, model, prototype, pattern, sample, design, logo, technical information, invention, method or process and all other property, work or materials which are produced by the contractor in performing the contract or conceived, developed or first actually reduced to practice in performing the contract (herein called "the Property") shall vest in the CITY OF IQALUIT and the contractor hereby absolutely assigns to the CITY OF IQALUIT the copyright in the property for the whole of the term of the copyright. The contractor shall not be responsible for any loss or damage suffered by the City of Iqaluit or any third parties resulting from any unauthorized use or modification of the property, errors in transmission of the property, changes to the Property by others, the consequences of design defects due to the design of others, or defects in contract documents prepared by others, and the City of Iqaluit agrees to defend, indemnify, and hold the Contractor harmless from and against all claims, demands, losses, damages, liability and costs associated therewith. Subject to the foregoing, the Property may be relied by the City of Iqaluit for design and construction work undertaken by other parties with respect to the Services provided that such parties verify the accuracy and completeness of the Property to their satisfaction.

5.8 It is intended that all provisions of this agreement shall be fully binding and effective between the parties, but in the event that any particular provision or provisions or a part of one is found to be void, voidable or unenforceable for any reason whatever, then the remainder of the agreement shall be interpreted as if such provision, provisions, or part thereof, had not been included.

5.9 This contract may be extended by the written consent of the parties.

5.10 The CITY OF IQALUIT may delegate any of its authority and undertaking pursuant to this contract to any employee or contractor the CITY OF IQALUIT by notice in writing to the Contractor.

5.11 This contract shall ensure to the benefit of and be binding on the respective administrators, successors and assignment of each of the parties hereto.

6. CONTRACTOR RESPONSIBILITIES

6.1 The Contractor shall provide all equipment, supplies and materials necessary in connection with providing and carrying out the Services. The Contractor shall obtain and maintain, at its expense, all permits and licenses, and comply with all applicable laws which shall or might affect or apply to the Services.

6.2 The Contractor shall perform the Services with that degree of professional skill, care and diligence that an experienced and competent professional in the same field would use in performing similar services in relation to a project similar in scale and complexity to Services, and in a competent, efficient, lawful and ethical manner.

6.3 The Contractor shall indemnify and hold harmless, the CITY OF IQALUIT, its officers, employees, servants and agents from and against all claims, actions, causes of action, demands, losses, costs, damages, expenses, suits or other proceedings by

whomsoever made, brought or prosecuted in any manner based upon or related to the negligent acts, errors, or omissions of the Contractor under this contract or the performance of the Services.

6.4 The Contractor shall be liable to the CITY OF IQALUIT for any loss or damage to property or equipment that is supplied to or placed in the care, custody or control of the Contractor for use in connection with the contract if such loss or damage is attributable to the negligence or deliberate acts of the Contractor or its employees or agents.

6.5 The Contractor shall not subcontract its Services hereunder, to any Subcontractor or third person without the prior written consent of the CITY OF IQALUIT. If the Contractor subcontracts any part of the Services, it shall require by contract that the Subcontractor comply with the provisions of this Contract of general application and of application specifically to the Services subcontracted, including without limitation to provide insurance as specified in ARTICLE 9. Contractor shall be fully responsible for any part of the Services performed by Subcontractor and for the acts or omissions of Subcontractor and all persons either directly or indirectly employed by them, to the same extent as the Contractor is for its own acts or omissions

6.6 The Contractor shall produce verbal and written reports, analyses, schedules, and other documents relating to the Services upon the request of the CITY OF IQALUIT. To produce the said reports, analyses, schedules and other documents the Contractor shall be given reasonable access facilities, equipment, and personnel of the CITY OF IQALUIT as may be required.

6.7 The Contractor shall establish and maintain, to the satisfaction of the CITY OF IQALUIT, appropriate business standards, procedures and controls including business standards, procedures and controls necessary to avoid any real or apparent impropriety or adverse impact on the interests of the CITY OF IQALUIT.

6.8 If, in the opinion of the CITY OF IQALUIT acting reasonably, the Contractor is in default in respect of any obligation of the Contractor hereunder, the CITY OF IQALUIT may rectify such default and any direct costs associated with any such remediation, including a reasonable allowance for the use of the CITY OF IQALUIT's own employees or equipment. Shall be due and owing by the Contractor to the CITY OF IQALUIT.

6.9 The Contractor may not assign or delegate work to be done under this contract, or any part thereof, to any other party without the prior written consent of the CITY OF IQALUIT. In the case of a proposed assignment of monies owing to the Contractor under this contract, the consent in writing of the CITY OF IQALUIT must first be obtained.

6.10 The Contractor shall keep proper accounts and records of the Services for a period of 3 years after the expiry or termination of this agreement. At any time during the term of this contract or during the three years following the completion or termination of this agreement, the Contractor shall produce copies of such accounts and records upon the written request of the CITY OF IQALUIT.

6.11 The Contractor shall notify the CITY OF IQALUIT immediately of any claim, action, or other proceeding made, brought, prosecuted or threatened in writing to be brought or prosecuted that is based upon, occasioned by or in any way attributable to the performance or non-performance of the services under this contract.

6.12 If at any time the Contractor considers their reasonable estimates indicate costs will exceed the project budget they will immediately advise the City of Iqaluit. If in the opinion of the City of Iqaluit, acting reasonably, the excess is due to design, costs factors or matters under the control or reasonably foreseeable by the Contractor, the CITY OF IQALUIT may require the Contractor to do everything by way of revision of the design to bring the cost estimate within the project budget. Costs of completing such revisions shall be based upon a level of compensation reasonably appropriate to the circumstances, including the reason for the revisions.

6.13 Except as required in the performance of Services set out in this agreement, the Contractor must maintain as confidential all data and information made available to the Contractor, the CITY OF IQALUIT, or any other parties which is generated by or results from the Contractor performance of the Services described in this Contract. All such data and information is the property of the City of Iqaluit. This clause shall survive the termination of the Contract.

7. TERMINATION

7.1 The CITY OF IQALUIT may terminate this contract at any time upon giving written notice to this effect to the Contractor if, in the opinion of the CITY OF IQALUIT, the Contractor is unable to deliver the service as required, the Contractor's performance of work is persistently faulty, in the event that the Contractor becomes insolvent or commits an act of bankruptcy, in the event that any actual or potential labor dispute delays or threatens to delay timely performance of the contract or the (Contractor's Sub- Contractor) defaults or fails to observe the terms and conditions of the contract in any material respect.

7.2 This contract shall terminate as of the day for termination set out in the written notice and the Contractor shall forthwith invoice the CITY OF IQALUIT for work performed to the date of termination.

7.3 Any invoice submitted by the Contractor pursuant to clause 7.2 shall be reviewed by the CITY OF IQALUIT to assess the amount which is properly due and owing for work done by the Contractor prior to termination.

8. FINANCIAL

8.1 The CITY OF IQALUIT, having given written notice of a breach, may withhold or hold back in whole or in part any payment due the Contractor without penalty, expense or liability, if in the opinion of the Contracting Authority, the Contractor has failed to comply with or has in any way breached an obligation of the Contractor. Any such hold back shall continue until the breach has been rectified to the satisfaction of the CITY OF IQALUIT.

8.2 The CITY OF IQALUIT may set off any payment due the Contractor against any monies owed by the Contractor to the CITY OF IQALUIT.

8.3 The City of Iqaluit will pay the Goods and Services Tax (GST).

8.4 Provided all terms and conditions on the part of the Contractor have been complied with, each invoice will be paid thirty (30) calendar days after receipt of the invoice, or thirty (30) calendar days after delivery of the services, whichever is later.

8.5 The CITY OF IQALUIT may, in order to discharge lawful obligations or to satisfy lawful claims against the Contractor or a Sub-Contractor arising out of the execution of work,

pay any amount, which is due and payable to the Contractor under the contract, if any, directly to the obligee of and the claimants against the Contractor or Sub-Contractor.

9. INSURANCE AND LIABILITY

9.1 The Contractor's liability to the City of Iqaluit for claims arising out of this Agreement, or in any way relating to the Services, will be limited to direct damages and to the re-performance, without additional compensation, of any Services not meeting a normal professional standard of care and such liability will, in the aggregate, not exceed the amount of $1,000,000.00. The limitations of liability will apply, to the extent permitted by law, whether Contractor's liability arises under breach of contract or warranty; tort, including negligence; strict liability; statutory liability; or any other cause of action, and will extend to and include Contractor's directors, officers, employees, insurers, agents and sub-contractor.

9.2 In no event will either party be liable to the other party for indirect or consequential damages including without limitation loss of use or production, loss of profits or business interruption.

9.3 The Contractor shall, without limiting his obligations or liabilities hereto, obtain, maintain and pay for during the period of this agreement, the following insurance with limits not less than those shown:

a) Workers' Compensation insurance covering all employees engaged in the work in accordance with the statutory requirements of the Territory or Province having jurisdiction over such employees. If the Contractor is assessed any additional levy, extra assessment or super-assessment by a Workers' Compensation Board as a result of an accident causing injury or death to an employee of the Contractor or any sub-contractor, or due to unsafe working conditions, then such levy or assessment shall be paid by the Contractor at its sole cost and is not reimbursed by the CITY OF IQALUIT.

b) Employer's liability insurance with limits not less than $500,000 for each accidental injury to or death of the contractor's employees engaged in the work. If Workers' Compensation insurance exists, then in such event, the aforementioned Employer's Liability insurance shall not be required but the Comprehensive General Liability policy referred to in item (d) herein shall contain an endorsement providing for Contingent Employers' Liability insurance.

c) Motor Vehicle, standard liability insurance covering all vehicles owned or non-owned, operated and/or licensed by the Contractor and used by the Contractor in the performance of this agreement in an amount not less than one million dollars ($1,000,000.00) per occurrence for bodily injury, death and damage to property; and with respect to limits of not less than one million dollars ($1,000,000.00) for vehicle hazards and not less than one million dollars ($1,000,000.00) for Bodily Injury to or death of one or more passengers and loss of or damage to the passengers property in one accident.)

d) Comprehensive General Liability Insurance with limits of not less than $5,000,000.00 (inclusive) per occurrence for bodily injury, death and damage to property including loss of use thereof. Such insurance shall include but not be limited to the following terms and conditions:

- Products & Completed Operations Liability *

- Contractor's Protective Liability
- Blanket Contractual Liability
- Broad Form Property Damage
- Personal Injury Liability
- Cross Liability
- Medical Payments
- Non-owned Automobile Liability *
- Contingent Employers Liability *
- Employees as Additional Insureds *

**WHERE APPLICABLE*

e) Professional Liability Insurance with limits of not less than two hundred fifty thousand dollars ($250,000.00) per claim and five hundred thousand dollars ($500,000.00) in the annual aggregate, to cover claims arising out of the rendering of or failure to render any professional service under this contract or agreement.

All policies shall provide that thirty days written notice be given to the CITY OF IQALUIT prior to any cancellations of any such policies.

The comprehensive general liability Insurance policies shall name the CITY OF IQALUIT and any permitted sub-contractor's as additional insureds only with respect to the terms of this contract and shall extend to cover the employees of the insureds hereunder.

The contractor shall be responsible for any deductibles, exclusions and/or insufficiency of coverage relating to such policies.

The contractor shall deposit with the CITY OF IQALUIT prior to commencing with the work a certificate of insurance evidencing the insurance(s) required by this clause in a form satisfactory to the CITY OF IQALUIT and with insurance companies satisfactory to the CITY OF IQALUIT.

10. MISCELLANEOUS

10.1 **Amendments.** This agreement or any part thereof may not be modified, supplemented, or amended except as otherwise herein provided or by mutual agreement expressed in writing and duly executed by the parties hereto.

10.2 **Prior Agreements**. This agreement supersedes and replaces any and all prior representations, proposals, negotiations, letters of understanding, agreements, bids, quotations, purchase orders, contracts, or amendments thereto or any other communications, verbal or written between the parties hereto relating to the subject matter hereof.

10.3 **Entire Agreement**. This agreement sets forth the entire agreement between the parties hereto relating to the subject matter hereof.

10.4 **Remedies Cumulative**. The remedies of the CITY OF IQALUIT in this agreement are cumulative and are in addition to any remedies available to the CITY OF IQALUIT at law or in equity. No remedy will be deemed to exclude or to restrict the right of the CITY OF IQALUIT to any remedies against the Contractor and the CITY OF IQALUIT may from

time to time have recourse to one or more of the remedies specified in this agreement or at law or in equity notwithstanding the termination of this agreement.

10.5 **Limitation of Liability**. Notwithstanding any other provision of this agreement, the total liability of the CITY OF IQALUIT with respect to this agreement or any obligations in connection with the agreement, whether based on warranty, indemnity, contract, tort (including negligence), strict liability or otherwise, shall be limited to the compensation paid to the Contractor under this agreement.

10.6 **General Interpretation**.

In this Agreement, unless the context implies otherwise:

a) references to Sections and Appendices are to be construed as references to the sections of, and schedules to, this Agreement;

b) references to this Agreement or any other document shall be construed as references to this Agreement or that other document as amended, supplemented, novated or otherwise varied from time to time;

c) references to a provision of law is a reference to that provision as amended or re-enacted;

d) headings appearing in this Agreement are for convenience of reference only and in no way define, limit, or enlarge the scope or meaning of the provision.

e) words importing the plural shall include the singular and vice versa;

f) the word “include”, “includes” or "including", when following any general statement, term or matter, shall not be construed to limit such general statement, term or matter to the specific items or matters set forth immediately following such word or to similar items or matters, whether or not non-limiting language (such as "without limitation" or "but not limited to" or words of similar import) is used with reference thereto but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement, term or matter;

g) any terms, covenants, provisions or conditions of this Contract which expressly or by their nature survive the termination of this Contract shall continue in full force and effect subsequent to and notwithstanding such termination, and shall not be merged with the termination, until such terms, covenants, provisions and conditions are satisfied or by their nature expire;

h) “hereof”, “herein”, “hereto” and “hereunder” and similar expressions refer to this Agreement and not to any particular Article, Section or other subdivision; and

i) references to a time of day shall be construed as references to Eastern Standard Time.

10.7 **Counterpart Execution**. This Agreement may be executed in separate counterparts, each of which, when so executed, shall be deemed to be an original, and such counterparts shall constitute the one and the same instrument. The counterparts of this Agreement and all ancillary documents may be executed and delivered by facsimile or other electronic signature by any of the parties hereto to any other party and the receiving party may rely on the receipt of such document so executed and delivered by facsimile or other electronic means as if the original had been received.

IN WITNESS WHEREOF the parties hereto have set their hand as of the date and year entered below.

FOR THE CITY OF IQALUIT:

_____
Name/Title

_____
Signature

_____
Date

_____
Witness

FOR THE CONTRACTOR:

[LEGAL NAME]

_____
Name/Title

_____
Signature

_____
Date

_____
Witness

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1. GENERAL PROVISIONS

1.1 DEFINITION

The following terms, whenever used in the Contracto Documents, shall mean:

1.1.1 **"Adjustment":** a change in either the Contract Price or the Contract Time, or both, in accordance with the applicable provisions of the Contract Documents;

1.1.2 "**Applicable Laws**": any and all applicable laws, rules, regulations, by-laws, codes and orders of any and all government bodies, agencies, authorities and courts;

1.1.3 "**Arbitrator**": the person appointed under GC 9.3.1;

1.1.4 "**Articles of Agreement**": the executed Articles of Agreement;

1.1.5 "**Change Order**": a written instrument prepared by the City Representative and signed by the City and the Contractor stating their agreement upon:

.1 a change in the Work, and

.2 the method and/or the amount of Adjustment, if any;

1.1.6 "**City**": the party defined as such in the Articles of Agreement;

1.1.7 "**City Representative**": A Consultant, Owner's Agent, and/ or Engineer designated as such in the Articles of Agreement, or such other person designated as such by the City from time to time, who will be responsible for administering the construction contract;

1.1.8 "**Claim":** any or all of:

.1 a demand or assertion by the City or the Contractor seeking an interpretation of Contract terms, an Adjustment, or other relief with respect to the terms of this Contract;

.2 other disputes and matters in question between the City and the Contractor arising out of or relating to this Contract; and

.3 allegations by the City or the Contractor of errors or omissions on the part of the City Representative;

1.1.9 "**Completion Date**": the date of Substantial Performance of the Work, as certified by the City Representative;

1.1.10 "**Construction Schedule":** the Construction Schedule referred to in GC 3.6, including revisions thereto as provided in GC 3.6, GC 10.2.4 or otherwise required by the City Representative;

1.1.11 "**Consultant":** a person retained by the City to act as the City's Representative;

1.1.12 "**Contract**": the undertaking by the parties to perform their respective duties and discharge their **obligations** as set out in the Contract Documents which represents the entire agreement between the parties;

1.1.13 "**Contract Documents**": the documents referred to in the Articles of Agreement and **amendments** agreed on by the parties in writing;

1.1.14 "**Contract** Price": the sum stated in the Articles of Agreement and as may be amended during the progress of the Work;

1.1.15 "**Contract** Time": the time stated in the Articles of Agreement, and as may be amended during the progress of the Work, elapsing from the date of commencement of the Work until the date of Substantial Performance of the Work, as certified by the City Representative;

1.1.16 "**Contractor**": the party defined as such in the Articles of Agreement;

1.1.17 "**Day**": a calendar day;

1.1.18 "**Engineer**": a person retained by the City to act as the City's Representative;

1.1.19 "**Final** Completion": **when** the Work has been performed in accordance with the Contract Documents, as certified by the City Representative;

1.1.20 "**GC**": an acronym reference to a clause in these general conditions of this Contract;

1.1.21 "**Holdback** Payment **Certificate**": a certificate issued in accordance with GC 5.6;

1.1.22 "**Lien Holdback**": has the meaning given in GC 5.2.1.1;

1.1.23 "**Owner's Agent**": a person retained by the City to act as the City's Representative;

1.1.24 "**Project**": the total construction of which the Work to be performed under this Contract may be the whole or a part;

1.1.25 "**Referee**": the person appointed under GC 9.2.1;

1.1.26 "**Site**": the **land** or actual place designated in the Contract Documents for the performance of the Work;

1.1.27 "**Subcontractor**": a party having a direct contract with the Contractor for the performance of any part of the Work, or to supply products worked to a special design for the Work;

1.1.28 "Substantial Performance": when the Work has progressed to the point where, in the opinion of the City Representative as evidenced by the certificate of Substantial Performance, it is sufficiently complete, in accordance with the Contract Documents, so that the Work can be utilized for the intended purpose;

1.1.29 "**Supplier**": a party having a direct contract with the contractor to supply products not worked to a special design for the Work;

1.1.30 "**Work**": all or any part of the construction and services required by the Contract Documents, including all labour, materials, equipment and services provided or to be provided by the Contractor to fulfill his obligations under this Contract.

1.1.31 **"Warranty Holdback"**: has the meaning given in GC 5.2.1.3.

1.2 DOCUMENTS AND INTERPRETATION

1.2.1 It is the intent of the Contract Documents to include all labour, materials, equipment and services necessary to perform the Work in accordance with the Contract Documents. Any labour, materials, equipment and services that may be reasonably inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result, will be furnished and performed by the Contractor, whether or not specifically called for.

1.2.2 The Contract Documents are complementary, and what is required by one document shall be as binding as if required by all.

1.2.3 This Contract represents the entire agreement between the City and the Contractor and supersedes all prior negotiations, representations and agreements, either written or oral.

1.2.4 When words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents and are not otherwise defined, they shall be interpreted in accordance with that meaning.

1.2.5 The Contract Documents shall not be construed to create a contractual relationship of any kind between:

.1 the City Representative and the Contractor, a Subcontractor, a Supplier, a subcontractor or its or their agent or employee, or other person performing any of the Work;

.2 the City and a Subcontractor, a Supplier, or their agent, employee, or other person performing any of the Work, or;

.3 between any persons or entities other than the City and the Contractor.

The City Representative shall however, be entitled to demand performance and enforce the obligations of the parties under this Contract, to facilitate performance of the City Representative's duties.

1.2.6 Clarifications and interpretations of the Contract Documents shall be issued by the City Representative as provided in GC 4.1.

1.2.7 In the event of any inconsistency or conflict between provisions of the Contract Documents, the following shall apply:

.1 documents of later date shall govern over earlier documents of the same classification;

.2 figured dimensions shown on drawings shall govern over scaled dimensions;

.3 drawings of larger scale shall govern over those of smaller scale;

.4 specifications shall govern over drawings;

.5 the general conditions shall govern over the specifications;

.6 supplementary general conditions shall govern over the general conditions, and

.7 the Articles of Agreement shall govern over all documents.

1.2.8 The City shall provide the Contractor with as many sets of Contract Documents as are reasonably required for the performance of the Work.

1.2.9 The Contractor shall maintain a set of drawings on the Site and record accurately and legibly all deviations caused by Site conditions and written instructions or change orders ordered by the City Representative. The Contractor shall also keep one copy of all current Contract Documents and shop drawings on the Site, in good condition. These documents shall be available to the City Representative throughout the duration of the Work.

1.2.10 All Contract Documents, including copies, and all models furnished by or to the Contractor are and shall remain the property of the City and are not to be used on other work. The Contract Documents are not to be copied or revised in any manner without the City's written consent.

1.2.11 The division into sections, the table on contents, and the heading in the Contract Documents, other than in the drawings and specifications, form no part of this Contract but are inserted for convenience of reference only.

1.2.12 Any reference to a statutory provision shall include any subordinate legislation made and from time-to-time amended, extended or re-enacted.

1.2.13 Unless otherwise indicated, all dollar amounts referred to in this Contract are in lawful money of Canada.

1.2.14 If any provision of this Contract is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability shall attach only to such provision and everything else in this Contract shall continue in full force and effect, In the event that any provision of this Contract, as amended from time to time, shall be deemed invalid or void, in whole or in part, by any court of competent jurisdiction, the remaining terms and provisions of this Contract shall remain in full force and effect.

1.2.15 The schedules, appendices and attachments to this Contract are an internal part of this Contract and a reference to this Contract includes a reference to the schedules, appendices and attachments.

1.2.16 The language of the specifications and other documents comprising this Contract is in many cases written in the imperative for brevity. Clauses containing instruction, directions or obligations are directed to the Contractor and shall be construed and interpreted as if the words "the Contractor shall" immediately preceded the instructions, directions or obligations.

1.2.17 Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.

1.2.18 Unless otherwise provided in this Contract, all accounting and financial terms used in this Contract shall be interpreted and applied in accordance with Canadian generally accepted accounting principles, consistently applied from one period to the next.

1.2.19 References containing terms such as:

.1 "hereof," "herein," "hereto," "hereinafter," and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Contract taken as a whole; and

.2 "includes" and "including", whether or not used with the words "without limitation" or "but not limited to", shall not be deemed limited by the specific enumeration of items but shall in all cases be deemed to be without limitation and construed and interpreted to mean "includes without limitation" and "including without limitation";

1.2.20 Whenever the terms "will" or "shall" are used in this Contract in relation to the Contractor they shall be construed and interpreted as synonymous and to read "the Contractor shall".

1.3 NOTICES

1.3.1 Where a notice is required by the Contract Documents to be given in writing to the Contractor, it may be delivered personally to the Contractor or his site superintendent, or delivered or sent by mail or facsimile transmission to the Contractor's address set out in the Articles of Agreement or to his office at or near the Site.

1.3.2 Where a notice is required by the Contract Documents to be given in writing to the City Representative, it may be delivered personally, by email, or delivered or sent by mail or facsimile transmission to the City Representative's address set out in the Articles of Agreement, or to the office of the City Representative at or near the Site.

1.3.3 Notwithstanding the foregoing provisions of this GC 1.3, each party shall use the most expeditious method of giving the written notice or communication.

1.3.4 A written notice or communication sent by mail shall be deemed to have been received ten (10) business days from the date of posting. Whenever a notice or communication is sent by facsimile transmission, acknowledgement from the receiving party must be given to the other party that the notice or communication has in fact been received, for it to be effective; this acknowledgement may be made verbally, in person or by telephone. If no such acknowledgement is given, it shall be deemed to have been received and be effective ten (10) business days from the date the original document was sent.

1.4 RIGHTS AND RENDERS

1.4.1 No obligations or responsibilities of any kind by or on behalf of the City shall be implied into the Contract Documents if in the opinion of the City Representative, it is not reasonable under the circumstances to imply that such obligations or responsibilities form part of the Contract Documents.

1.4.2 Any failure by the City or the City Representative to enforce or to require the strict performance of any of the provisions of this Contract shall not, in any way constitute a waiver of those provisions and affect or impair those provisions or

any right the City has at any time to avail itself of any remedies the City may have for any breach of these provisions or to require the Work to be performed in accordance with the Contract Documents.

1.4.3 Except as expressly provided in the Contract Documents, the duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

1.5 ASSIGNMENT

This Contract, or any part of it, or any benefit or interest in it, shall not be assigned by either party without the prior written consent of the other party, which consent shall not be unreasonably withheld. Notwithstanding the foregoing, the City has the right, in the event of any default by the Contractor, to assign all its rights and remedies against the Contractor to the Government of Nunavut.

1.6 APPLICABLE LAW

This Contract shall be deemed to have been made in Nunavut and shall be governed by and interpreted in accordance with the laws of Nunavut and the laws of Canada applicable therein.

1.7 SUCCESSORS AND ASSIGNS

This Contract shall ensure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and assigns.

2. CITY'S OBLIGATIONS

2.1 PAYMENT

Subject to any other provision in the Contract Documents, the City shall make payments to the Contractor at the times and in the manner set out in GC 5.

2.2 SITE AVAILABILITY

2.2.1 The City shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access to the Site and any other lands designated for the use of the Contractor. The Contractor shall provide and pay for any additional lands and access the Contractor may require, in accordance with GC 3.10.1.

2.2.2 Except for permits and fees which are the responsibility of the Contractor under GC 3.13, the City shall obtain and pay for necessary approvals, easements and charges required for the development of the Site and for the use or occupancy of permanent structures or for permanent changes in existing facilities.

2.3 CONSULTANT, OWNER'S AGENT, AND/ OR ENGINEER AS CITY REPRESENTATIVE

2.3.1 Unless otherwise provided in the Contract Documents, the City shall communicate with the Contractor through the Consultant, and the Contractor shall communicate with the City through the Consultant.

2.3.2 If the contract with the Consultant is terminated, the City shall promptly appoint a replacement.

2.4 REFERENCE POINTS

The City shall establish physical reference points for construction on the Site which are, in the opinion of the City Representative, necessary to enable the Contractor to proceed with the Work. The Contractor shall safeguard such reference points in accordance with GC3.11.2.

2.5 MATERIALS SUPPLIED BY THE CITY

Any materials, instructions, information or services required to be supplied by the City under this Contract shall be furnished with reasonable promptness to avoid delay in the orderly progress of the Work. Unless explicitly stated in the Contract documents, all materials, instructions, information or services shall be supplied by the Contractor.

2.6 CONTROL OF THE WORK

Neither the City nor the City Representative shall supervise or have control or authority over, nor be responsible for, the Contractor's means, methods, techniques or procedures of construction. Neither the City nor the City Representative will be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents, nor for its failure to comply with Applicable Laws.

2.7 LIMITATION OF LIABILITY

In no event, including without limitation if the City breaches its obligations under this Contract, shall the City be liable to the Contractor, its Subcontractors, its Suppliers, or any other parties engaged directly or indirectly by or acting on their behalf, for indirect loss, consequential loss, loss of business opportunity or loss of anticipated profit.

3. CONTRACTOR'S OBLIGATIONS

3.1 GENERAL OBLIGATIONS

Notwithstanding any omissions from the Contractor's tender, the Contractor is required to perform all of the Work required by the Contract Documents, including any Work which can be reasonably inferred from them as being necessary to produce the intended result. The Contractor is to perform the Work within the Contract Time, in accordance with the Construction Schedule referred to in GC 3.6.

3.2 INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and shall have complete control of the Work. The Contractor shall effectively direct and supervise the Work to ensure conformance with the Contract Documents. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all parts of the Work, except as may be otherwise specified in the Contract Documents.

Nothing in this Contract shall be construed to mean that the Contractor is an employee, agent or other representative of the City.

3.3 REVIEW OF CONTRACT DOCUMENTS

3.3.1 By executing this Contract, the Contractor represents that the Contractor has reviewed the Contract Documents and has verified the dimensions, quantities and details described in them. Failure to discover or correct errors, omissions, conflicts or discrepancies which ought to have been discovered by such a review shall not relieve the Contractor from full responsibility for unsatisfactory Work, faulty construction or improper operations resulting therefrom, nor from rectifying such conditions at the Contractor's expense.

3.3.2 If the Contractor proceeds with the Work in the face of an error, inconsistency or omission that the Contractor discovered, or that a competent Contractor reasonably experienced in the Work would have discovered, without additional instructions from the City Representative, then the Contractor shall at the Contractor's cost remove or replace any incorrectly constructed Work.

3.4 SITE CONDITIONS

3.4.1 By executing this Contract, the Contractor represents that the Contractor is familiar with the conditions under which the Work is to be performed. The Contractor further represents that the Contractor understands the requirements of the Contract Documents and what effects the Site conditions will have on the Work. The Contractor's failure to visit the Site will not excuse the Contractor from the responsibility which otherwise would have been assumed, had the Contractor visited the Site.

3.4.2 Following the start of the Work, if the subsurface conditions are substantially different from what could reasonably have been expected, based on a reasonable and proper examination of the Site by the Contractor and the information provided in the tender documents, if any, the Contractor must promptly notify the City Representative in writing prior to performing the Work.

The Contractor may make a claim for changed site conditions in only accordance with GC 9.1.

3.5 TEMPORARY STRUCTURES

The Contractor shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities and the design and execution of construction methods required in their use. The Contractor shall engage and pay for professional engineering personnel, registered to practice in Nunavut, skilled in the appropriate discipline, to perform these functions where required by law or by the Contract Documents and in all cases where such temporary facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results. The Contractor shall submit engineered documents to the City Representative, for review, before commencing temporary work.

3.6 SCHEDULE

3.6.1 Within ten (10) business days of executing the Articles of Agreement and as a condition of the first progress payment, the Contractor shall submit to the City Representative for review, a proposed Construction Schedule showing the anticipated time of commencement and completion of each of the major activities of the Work to be performed. This Construction Schedule shall include the sequence and coordination of the various operations and the estimated time required for the Work and shall provide sufficient detail to permit the City Representative to monitor the progress of the Work. The Contractor shall revise the proposed Construction Schedule as requested by the City Representative, and the Contractor shall perform the Work in strict adherence to the Construction Schedule, including revisions thereto required by the City Representative, unless it is changed in accordance with the terms of this Contract. Any deviations from the Construction Schedule must be approved by the City or the City Representative.

3.6.2 If at any time it should appear to the City Representative that the actual progress of the Work does not conform to the Construction Schedule, the Contractor shall produce at the City Representative's request, a revised Construction Schedule showing the modifications necessary to ensure completion of the Work in accordance with the previously approved Construction Schedule and shall promptly adopt acceptable additional means and methods of construction, at no cost to the City, which will make up for the time lost and will ensure completion in accordance with the revised Construction Schedule.

3.6.3 If the Contractor fails or refuses to revise the Construction Schedule as required by this GC, this Contract may be terminated at the City's option, in accordance with GC 10.3.

3.6.4 The City Representative's review, comments, consent, acceptance or approval to the Construction Schedule shall not relieve the Contractor of any of the Contractor's obligations under this Contract.

3.7 SUPERINTENDENT

3.7.1 The Contractor shall assign a competent superintendent and necessary assistants, one or more of whom shall be in attendance at the Site at all times during the progress of the Work. The superintendent and necessary assistants, if any, shall be designated in writing to the City Representative and shall act as the Contractor's authorized representative at the Site. All written or oral communications to the superintendent shall be deemed to have been given to the Contractor. The superintendent shall only be replaced after the Contractor has received written approval from the City.

3.7.2 The City may order the removal from the Work of any superintendent, supervisor, foreman or other employee who is in the opinion of the City, unfit for the Work, unskilled in the work assigned to him or otherwise unsuitable. Any person so removed shall not be re-employed on the Work by the Contractor or by a Subcontractor.

3.8 SUBCONTRACTORS

3.8.1 The Contractor shall not employ any Subcontractor without the approval of the City. Once the names of the proposed Subcontractors have been submitted, the Contractor shall not change these Subcontractors without the advance written consent of the City. If any changes are made without consent, this Contract may be terminated at the City's option, in accordance with GC 10.3.

3.8.2 The City, through the City Representative, may, at any time during the performance of the Work, object to the use of a Subcontractor and direct the Contractor in writing to employ a different Subcontractor satisfactory to the City Representative.

3.8.3 The Contractor shall be fully responsible to the City for the acts and omissions of Subcontractors, their agents, employees, and all parties engaged by the Contractor or its Subcontractors for the provision of work or the supply of materials.

3.8.4 The Contractor agrees to incorporate the terms of the Contract Documents into all the Contractor's subcontract agreements.

3.8.5 The Contractor shall maintain good order and discipline among the Contractor's employees and the Subcontractors engaged in the Work. The Contractor shall not employ, or permit Subcontractors to employ, workers who are not skilled in the assigned task. The Contractor shall employ sufficient workers to perform the Work in compliance with the Construction Schedule.

3.9 OTHER CONTRACTORS

3.9.1 The City reserves the right to let separate contracts with other contractors or workers, or to undertake work using the City's own forces to do other work. If other contractors, workers or the City's own forces are sent onto the Site, with or without plant and material, the Contractor shall, to the satisfaction of the City, grant access to and cooperate with such persons and, in accordance with usual construction practice, coordinate the Work with the other work and connect to other work as specified or shown in the Contract Documents.

3.9.2 The Contractor shall at all times remain the Constructor, with regards to the Health and Safety Act requirements. The City and other contractors entering the Contractors site shall be responsible for adhering to the Contractor's Health and Safety policy and the City of Iqaluit's Contractor Safety, Health and Environmental Minimum Performance Standard (MPS) document as referenced in Part VI – General Requirements.

3.9.3 If the sending of other contractors, workers or the City's own forces onto the Site results in a delay in the performance of the Work, which could not have been reasonably foreseen or anticipated by the Contractor when executing the Articles of Agreement, the Contractor may make a claim therefore in accordance with GC 6.2 and 9.1.

3.9.4 If the Contractor discovers any deficiencies in any other work which might affect the Work, the Contractor shall immediately report such deficiencies to the City Representative and then confirm such report in writing.

3.10 USE OF THE SITE

3.10.1 The Contractor shall ensure confining the Contractor's equipment and plant, storage of materials and operations to limits indicated by the Contract Documents, by a specific direction of the City Representative or by Applicable Laws and shall not unreasonably occupy the Site. Where the Contractor requires additional land for the erection of temporary facilities and storage of materials, including access to them, the Contractor shall arrange for such and assume all costs and liabilities arising therefrom.

3.10.2 The Contractor shall not load or permit to be loaded on any part of the Work, a weight or load or force that will endanger its safety or exceed the design loads.

3.10.3 The Contractor shall not interfere in any way with the work or scheduling of any other contractor, worker or employee of the City. Subject to GC 3.9.2, in order to avoid or minimize such interference, the City may in its absolute discretion, establish schedules or methods and shall notify the Contractor accordingly.

3.11 SURVEY

3.11.1 The Contractor shall provide the City Representative with assistance, as required, to make any surveys and measurements, and to establish or check lines and grades.

3.11.2 The Contractor shall safeguard all points, stakes, grade marks and benchmarks made or established on the Work. The Contractor shall bear the expense of re-establishing them and for rectifying Work improperly installed due to the Contractor's failure to safeguard such points, stakes and marks. Additional surveys and staking required by the Contractor to perform the Work, shall be provided by the Contractor at its expense.

3.12 PROTECTION OF THE WORK, PROPERTY AND THE PUBLIC

3.12.1 The Contractor shall be responsible for protecting the Work, the City's property at the Site including the Contract Documents and any plant and material,

including plant and material supplied by the City to the Contractor, against loss or damage from any cause but subject to GC 3.15.3. In particular, the Contractor shall take necessary precautions, at the Contractor's expense, to ensure that:

.1 no person, adjacent property, right, easement or privilege is injured, damaged or infringed by reason of the Contractor's activities in performing the Work;

.2 pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the Work;

.3 fire hazards in or about the Work or the Site are minimized;

.4 adequate medical services are available to all persons employed on the Work at all times during the performance of the Work;

.5 adequate sanitation measures are taken in respect of the Work; and

3.12.2 The City Representative may order the Contractor to do such things and to perform such additional Work as the City Representative considers reasonable and necessary to ensure compliance with or to remedy a breach of GC 3.12.1 and the Contractor shall comply with the directions of the City Representative, at the Contractor's expense.

3.13 PERMITS

3.13.1 The Contractor shall procure and post at the Site all permits, certificates and licenses required for the construction of the Work and shall be responsible for all fees in respect thereof.

3.13.2 The Contractor will be responsible for procuring and coordinating all permits issued by the City's Public Works and Engineering Department. Such permits include, but not limited to:

.1 Water & Sewer Service Connection/ Disconnection Permit

.2 Utility Permit

.3 Road Closure Permit

Permit applications must be submitted to the City twenty (20) business days prior to the start of the works.

3.14 APPLICABLE LAWS

3.14.1 The Contractor shall perform the Work and give any required notices in full compliance with all Applicable Laws, ordinances, rules, regulations, codes and orders of the municipal and other authorities having jurisdiction which are in or come into force during the performance of the Work.

3.14.2 The Contractor shall have due regard for the protection of the environment in the performance of the Work and shall not place any materials, including without limitation, hazardous materials, or dispose of any such materials, or perform any Work in a manner contrary to applicable federal or territorial or municipal

environmental laws and regulations, either at the Place of the Work, or at any other place or property.

3.15 MATERIAL AND PLANT SUPPLIED BY CITY

3.15.1 The Contractor is liable for any loss or damage to material, plant or real property that is supplied or placed by the City in the care, custody and control of the Contractor for use in connection with the Work, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

3.15.2 The Contractor shall not use any material, plant or real property placed in the Contractor's care, custody and control by the City, except for the purpose of performing the Work.

3.15.3 The Contractor is not liable to the City for any loss or damage to material, plant or real property if that loss or damage results from and is directly attributable to reasonable wear and tear.

3.16 EQUIPMENT, PLANT AND MATERIAL SUPPLIED BY CONTRACTOR

3.16.1 Unless otherwise specified in the Contract Documents, the Contractor shall furnish and assume full responsibility for all materials, equipment, labour, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the performance, testing, finishing, start-up and completion of the Work. All materials, equipment, facilities, etc., furnished by the Contractor shall be maintained in a working, clean and sanitary manner.

3.16.2 Materials provided shall be new unless otherwise specified in the Contract Documents. Products that are not specified shall be of a quality best suited to their purpose and use, as approved by the City Representative.

3.16.3 All equipment, plant and material owned by the Contractor and to be incorporated in the Work, from the time of initial delivery to the Site, shall be deemed to be the property of the City; provided always that the vesting of such property shall not prejudice the right of the Contractor to the sole use of the said equipment, plant and material for the purpose of performing the Work nor shall it affect the Contractor's responsibility to operate and maintain the same in accordance with the Contract Documents. The City shall not at any time be liable for the loss of, damage to or risk of loss of any of the Contractor's equipment, plant or materials.

3.17 WORKERS' COMPENSATION ACT

3.17.1 The Contractor shall comply with and ensure compliance at time of tender by all Subcontractors, with the requirements of the Workers' Compensation Act, SNu 2007, C.15. The Contractor and its Subcontractors shall maintain accounts in good standing with the Workers' Safety and Compensation Commission. The Contractor shall provide verification from the Workers' Compensation Board that the Contractor's account is in good standing prior to the release of holdbacks, at the end of the warranty period and as requested by the City

Representative. The City may refuse to make a payment to the Contractor unless the Contractor furnishes evidence from the Workers' Compensation Board that the Contractor's account is in good standing.

3.17.2 If the City receives a notice from the Workers' Compensation Board that the Contractor's accounts, or any Subcontractors' accounts are not in good standing, or if a demand for payment is received, the City may suspend payments due to the Contractor until a letter of clearance is obtained or the City has paid the amount on behalf of the Contractor.

3.17.3 If the City is required to pay any amount to the Workers' Compensation Board on behalf of the Contractor, or any Subcontractor, the City may deduct the amount from any amount owing to the Contractor under this or any other contract, or may demand a reimbursement by the Contractor to the City for the amount paid by the City.

3.17.4 If at any time the performance of the Work is stopped because the Contractor unreasonably fails or refuses to comply with a regulation or order issued pursuant to the Workers Compensation Act, then such failure or refusal shall be considered a default under this Contract, and this Contract may be terminated at the City's option, in accordance with GC 10.3.

3.18 OCCUPATIONAL HEALTH AND SAFETY

3.18.1 The Contractor shall be solely responsible for construction safety at the Site as and to the extent required by the Safety Act, in effect at time of tender, and any other applicable construction safety legislation, regulations and codes, any City safety Policies, as amended from time to time, and by good construction practice.

3.18.2 In any case where, pursuant to the provisions of the Safety Act, R.S.N.W.T. 1988, c. S-1, as duplicated for Nunavut by s. 29 of the Nunavut Act, the Director of Inspections or a Safety Officer orders the Contractor or any Subcontractor performing the Work, to cease work because of failure to install or adopt safety devices directed by the regulations made under the said Act, or required by it, or because the Director of Inspections or a Safety Officer is of the opinion that conditions of immediate danger exist that would likely result in injury to any person, the City may exercise its right to terminate this Contract or suspend the Work immediately, in accordance with GC 10, until the default or failure is corrected.

3.19 CUTTING AND PATCHING

3.19.1 The Contractor shall do all cutting, fitting or patching of the Work that may be required to tie in properly with the work of other contractors shown in, or reasonably inferable from the Contract Documents.

3.19.2 The Contractor shall not endanger any existing Work by cutting, patching or otherwise, and shall not cut or alter the work of any other contractor save with the consent of the City Representative and then only to the extent permitted by the City Representative.

3.19.3 The Contractor hall not unreasonably withhold from the City or a separate contractor the Contractor's consent to cutting or otherwise altering the Work in accordance with any direction given by the City Representative.

3.20 DEFECTIVE WORK

3.20.1 Defective work, whether the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the Contractor or any Subcontractor, and whether incorporated in the Work or not, which has been rejected by the City Representative as failing to conform to the Contract Documents, shall be removed promptly from the Work and replaced or re- executed by the Contractor in accordance with the Contract Documents, at the Contractor's expense.

3.20.2 Where any part of the Work is damaged by such removals, replacements or re-execution, it shall be made good, promptly, at the Contractor's expense.

3.20.3 Where the Contractor fails to correct defective or rejected work within the time limits specified by the City Representative, the City may correct defective or rejected Work and deduct the cost of same from the Contract Price, or may terminate this Contract in accordance with GC 10.3.

3.20.4 In cases of emergency, the City may take whatever action it deems necessary to correct defective or rejected Work and deduct the cost of same from the Contract Price.

3.20.5 If, in the opinion of the City Representative, it is not expedient to correct defective work or work not done in accordance with the Contract Documents, the City may deduct from the Contract Price the difference in value between the Work as done and that required by this Contract, as determined and certified by the City Representative.

3.21 TESTING AND INSPECTION

3.21.1 Unless otherwise specified in the Contract Documents, the Contractor shall not rely on the City's testing program, for the Contractor's own quality control, but shall perform such testing as may be required to ensure that the Work complies in all respects with the Contract Documents.

3.21.2 The Contractor shall promptly provide the City Representative with two copies of all certificates, inspection and testing reports required by the Contract Documents or ordered by the City Representative.

3.21.3 The City Representative may conduct quality control testing regarding the acceptability of materials used in the Work and the Contractor shall furnish for the City Representative's approval such samples as the City Representative may reasonably require, at the Contractor's expense.

3.21.4 The City Representative may order retesting of questioned Work. If such retesting shows the Work to comply with the provisions of this Contract, the City shall pay the cost of retesting. If the retesting shows that through the fault of the Contractor the Work does not so comply, the Contractor shall pay all associated

costs. Testing which is paid for by the City shall not be subject to direction or control by the Contractor.

3.21.5 The City Representative shall at all times have access to the Work and the Contractor shall provide proper facilities for such access and for inspection. If any Work should be covered without the approval or consent of the City Representative, it must, if required by the City Representative, be uncovered for examination and subsequently recovered, both at the Contractor's expense.

3.21.6 Any inspection of the Work by the City Representative or the failure of the City Representative to make any inspection, or:

.1 the thoroughness or lack of thoroughness of any inspection made by the City Representative;

.2 the failure of the City Representative to observe defective workmanship or materials either by the Contractor or a Subcontractor;

.3 the failure to direct the attention of the Contractor or Subcontractor, or of any other person, to the inadequacy of the manner in which this Contract is being performed, or

.4 the inadequacy or insufficiency of any equipment or material used in the performance of or incorporated in the Work,

shall not relieve the Contractor from the responsibility for any failure to supply materials and complete the Work strictly in accordance with the Contract Documents.

3.22 SITE CLEANLINESS

3.22.1 The Contractor shall maintain the Site in a tidy condition and free from the accumulation of waste material and debris, to the satisfaction of the City Representative.

3.22.2 Before the issuance of a certificate of Substantial Performance, the Contractor shall remove all the Contractor's tools and material not required for the remaining Work, and all waste material and other debris, and shall ensure that the Work and the Site are clean and suitable for occupancy or use by the City, unless otherwise directed by the City Representative.

3.22.3 Before the issuance of a certificate of Final Completion, the Contractor shall remove from the Site all the Contractor's tools and material and any waste material and other debris, to the satisfaction of the City Representative.

3.22.4 If the Contractor fails or refuses to remove all such tools, materials, equipment and waste within a reasonable time after achieving Final Completion then, on written notice from the City Representative to the Contractor specifying a reasonable time to remedy such failure or refusal, the City may do or cause to be done the removal and all reasonable resulting costs incurred by the City may be deducted from any amounts owing by the City to the Contractor.

3.22.5 The Contractor's obligations described above do not extend to waste material and other debris caused by the City's agents or other contractors.

3.23 CLAIMS AGAINST AND OBLIGATIONS OF THE CONTRACTOR

3.23.1 The Contractor shall pay out and discharge all its lawful obligations and shall satisfy all lawful claims against it arising out of the performance of the Work at least as often as this Contract requires the City to pay the Contractor.

3.23.2 The Contractor shall, in accordance with the Contract Documents and whenever requested to do so by the City Representative, make a statutory declaration regarding the existence and condition of any obligations of and claims against the Contractor, any Subcontractors, or Suppliers. Upon request by the City, the Contractor shall provide letters from its Subcontractors and Suppliers regarding the status of any accounts with the Contractor and the details of any claims, if any.

3.23.3 The City may, in its absolute discretion, and at any time prior to the final release of holdbacks, in order to discharge lawful obligations of and satisfy lawful claims against the Contractor, any Subcontractors or Suppliers arising out of the performance of the Work, pay any amount that is due and payable to the Contractor pursuant to this Contract, directly to the obligees of and the claimants against, the Contractor, Subcontractor or Supplier. When the parties involved in the claim are in agreement on the validity and amount of the claim, the City may treat this as a lawful claim.

3.23.4 Where no agreement is reached between the parties as referred to above, the City may withhold payment, without any obligation to pay interest, until the validity and amount of the Claim is established by legal proceeding. The City may, in its absolute discretion, bring the matter before the Nunavut Court of Justice by way of Interpleader, and shall dispose of the funds withheld in accordance with the direction of the Court.

3.23.5 A payment made pursuant to this provision is, to the extent of the payment, a discharge of the City's liability to the Contractor under this Contract and may be deducted from an amount payable to the Contractor under this Contract.

3.24 PATENT RIGHTS

The Contractor shall indemnify the City from and against all claims, liabilities and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of the Contractor's equipment, materials or tools used for or in connection with, or for incorporation into the Work, and from and against all damages, costs, charges and expenses whatsoever relating thereto.

3.25 ROYALTIES

Except where otherwise stated, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for obtaining building materials required for the Work.

3.26 RECORDS TO BE KEPT BY CONTRACTOR

3.26.1 The Contractor shall maintain complete records of the Contractor's estimated and actual costs of the Work together with all tender calls, quotations, contracts,

correspondence, invoices and receipts. In accordance with the terms of this Contract, these documents shall be available for audit and inspection by the City or by persons acting on behalf of the City when requested. The Contractor shall furnish any such person with any information it may require from time to time in connection with these records.

3.26.2 Records maintained by the Contractor shall be kept intact for six years following the end of the warranty period or such other period of time as directed by the City Representative.

3.26.3 The Contractor shall ensure that all of its Subcontractors comply with the above requirements.

3.27 PUBLIC CEREMONIES AND SIGNS

3.27.1 The Contractor shall not permit any public ceremony in connection with the Work without the prior written consent of the City.

3.27.2 The Contractor shall not erect or permit the erection of any sign or advertising on the Site without the prior written consent of the City.

3.28 NON-COMPLIANCE BY CONTRACTOR

3.28.1 If the Contractor fails to comply, within a reasonable time, with any decision or direction given by the City Representative, the City may employ such methods as the City deems advisable to do that which the Contractor failed to do.

3.28.2 The Contractor shall pay the City the total of all costs, expenses and damages incurred or sustained by the City by reason of the Contractor's failure to comply with any decision or direction referred to above, including the cost of any method employed by the City. Where the amounts owing to the Contractor under this Contract are insufficient to cover such costs, the Contractor shall pay the balance to the City immediately.

4. ADMINISTRATION BY CITY REPRESENTATIVE

4.1 CITY REPRESENTATIVE'S DUTIES AND AUTHORITY

4.1.1 The City Representative will administer this Contract on behalf of the City as provided in the Contract Documents.

4.1.2 The City Representative will be the City's representative until the Work has been completed in accordance with the Contract Documents.

4.1.3 Except as expressly stated in the Contract Documents, or at the discretion of the City, the City Representative shall have no authority to relieve the Contractor of any of the Contractor's obligations under this Contract.

4.1.4 The City Representative will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work performed and shall deal with Claims as they arise, in accordance with GC 9.1.

4.1.5 If any error, inconsistency, or omission in the Contract Documents is discovered, the City Representative shall provide directions or clarifications to the Contractor and notify the City immediately.

4.1.6 During the progress of the Work, the City Representative shall have authority to reject Work that, in the City Representative's opinion, does not conform with the requirements of the Contract Documents, or to issue written additional instructions regarding the Work which may, in the opinion of the City Representative, be necessary to supplement or clarify the Contract Documents. Such additional instructions shall be consistent with the intent of the Contract Documents, shall not entitle the Contractor to an Adjustment and shall be binding upon and be carried out promptly by the Contractor.

4.1.7 Wherever, under this Contract, the City Representative is required to exercise discretion by:

.1 rendering a decision, opinion or consent;

.2 expressing satisfaction or approval;

.3 determining value; or

.4 otherwise taking action which may affect the rights and obligations of the City or the Contractor, the City Representative shall do so impartially, consistent with the terms of this Contract and having regard to all of the circumstances. Any such decision, opinion, consent, expression of satisfaction or approval, determination of value or action, may be opened up, reviewed or revised as provided in GC 9.

4.2 OBSERVING THE WORK

The City Representative will visit the Site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents. However, the City Representative will not be required to make exhaustive or continuous

on-site inspections to check the quality or quantity of the Work. On the basis of such on-site observations, the City Representative will keep the City informed of the progress of the Work and will endeavour to guard the City against defects and deficiencies in the Work.

4.3 CITY REPRESENTATIVE'S DECISION

Except as provided in GC 4.1.7, neither the City Representative's authority or responsibilities under GC 4 or under any other provision of the Contract Documents nor any decision made by the City Representative in good faith either to exercise or not exercise such authority or responsibility, shall create, impose or give rise to any duty or responsibility owed by the City Representative to the Contractor, any Subcontractor, Supplier, or to any surety for or employee or agent of any of them.

5. PAYMENT AND COMPLETION

5.1 PROGRESS PAYMENTS

5.1.1 At the end of each calendar month, or such other period as is agreed to between the City Representative and the Contractor, the Contractor shall deliver to the City Representative a written progress claim that describes the Work that has been completed and any material that was delivered to the Site but not yet incorporated into the Work since the last progress claim. The Contractor's progress claim shall be submitted on the last day of the month, for the month which progress is being claimed. If the last day coincides on a weekend or holiday, it will be issued on the following business day.

5.1.2 The City Representative shall, within ten (10) business days of receipt of the Contractor's progress claim, review the claim and prepare a certificate for payment which may take the form of an endorsement on the progress claim. If the City Representative amends the progress claim, he will promptly notify the Contractor in writing, giving reasons for the amendment.

5.1.3 Where the Contractor does not submit a progress claim or where the City Representative does not endorse the Contractor's progress claim, the City Representative may calculate the progress payment and prepare a certificate for payment by the City. Where unit prices apply, payment will be calculated on the basis of the unit prices specified in the Contract Documents and the units of Work completed as determined by the City Representative. Where a lump sum price applies, payment will be calculated on the basis of the City Representative's estimate of the percentage of the Work completed.

5.1.4 The progress certificate will show, to the end of the period covered by the progress claim, the estimated value of all labour and materials incorporated into the Work, GST monies paid, all materials stored at the Site and all Change Orders certified by the City Representative. The certificate shall also show the aggregate of previous payments and the amounts withheld. The gross amount shown on such certificate, less the aggregate of all payments to date and sums withheld, shall become due and be payable by the City to the Contractor within thirty (30) calendar days following receipt by the City of the progress certificate.

5.1.5 The estimates referred to above shall not bind the City or the City Representative in any manner in the preparation of the final estimate of the Work done, but shall be held to be approximate only and shall in no case be taken as an acceptance of the Work or as a release of the Contractor from the Contractor's responsibilities under this Contract.

5.1.6 If for any reason the City disputes the net amount shown for payment on a progress certificate the City shall, within the time specified in this GC, pay to the Contractor any amount not disputed and also deliver to the Contractor and the City Representative written reasons for any deductions.

5.1.7 The following shall be added to the Progress Claims:

<u>Breakdown of Work Performed to Date</u>

- Invoice number on breakdown matches the Invoice Number
- Period Ending Date on breakdown matches Period Ending Date on Invoice
- Percent complete on breakdown is appropriate given previous Invoice breakdown
- Values claimed on Invoice Breakdown are appropriate given observations in Consultant Site Report
- Cost elements where no draw was requested have been confirmed with Payment Certifier

Breakdown of Cash Allowances

- All reported cash allowances match the contract values plus any changes
- Previously approved release amounts match the Cost Tracking Log at Period Ending Date
- Value of work claimed for Cash Allowances is appropriate given Consultant Site Report
- Values add up correctly

Breakdown of Project Change Notices

- All approved changes are identified (even if not being drawn against)
- Sum of approved Changes matches sum on Cost Tracking Log for Period End Date
- Value of work on claimed on Changes is appropriate given Consultant Site Report
- Values add up correctly

Invoice

- Invoice Date is not before Period Ending Date
- Payment terms are as per the Contract
- PO# has been properly identified
- The Invoice Number is correct
- GST/PST/HST is properly identified
- Invoice Amount matches the sum of the Breakdown of work performed to date
- Period Ending Date is correct

Certificate for Payment

- Number on Certificate matches the Invoice Number
- Certificate Period Ending Date matches the Invoice Period Ending Date
- Date prepared is after Invoice Date
- Project name is correct
- Contract Amount is correct
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date

- Lien holdback percentage is correct
- Verify all calculations and Total Value of Work Performed to Date
- Payment Certifier has signed the CoP

Statutory Declaration (CCDC 9A – 2018)

- Statutory Declaration is provided with the Certificate for Payment
- "Application for payment number" and "date" for the last payment received match Consultant and Owner records – confirm discrepancies with Owner
- Date of the contract, owner name, contractor name exactly match the Contract
- Seal (CCDC 9A 2018) is original and attached
- Signature and date of declaration is complete
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date

WSIB / WCB Review (required after construction starts)

- The Expiry Date of XXXX is beyond the end of the next invoice period
- Certificate number is included
- Form is signed (if applicable)

5.2 CONTRACT HOLDBACKS

5.2.1 The City will retain Contract holdbacks in accordance with the following:

.1 ten percent from each progress payment made prior to the issuance of the first Holdback Payment Certificate by the City Representative (the "Lien Holdback"), and

.2 five percent Owners Offset from any payments made to the Contractor following the issuance of the first Holdback Payment Certificate, other than from holdback payments.

5.3 SUBSTANTIAL PERFORMANCE

5.3.1 When the Contractor considers the Work ready to be utilized for its intended purpose, the Contractor may apply in writing to the City Representative to issue a Certificate of Substantial Performance. The Contractor shall prepare and submit with its application a comprehensive list of deficiencies and/or incomplete items to be completed or corrected, a statutory declaration as per GC 3.23.2 and particulars of, or a waiver of, all outstanding claims against the City, arising out of the Work. The Contractor shall proceed promptly to complete and correct the items on the list. Failure to include an item on this list does not alter the Contractor's responsibility to complete the Work in accordance with the Contract Documents.

5.3.2 Following the receipt of an application from the Contractor for a certificate of Substantial Performance, the City Representative shall, with reasonable promptness, make an inspection and assessment of the Work. Within five (5) business days of the inspection, the City Representative shall notify the Contractor of his approval, or reasons for, disapproval of the application. If the

City Representative determines that the Work is substantially completed, he shall issue a certificate of Substantial Performance to the City and the Contractor. A list of items to be completed or rectified shall accompany the certificate. If the City Representative does not consider the Work to be substantially completed, he shall notify the Contractor in writing of the reasons why and list the items to be completed or rectified, of which the City Representative is aware.

5.3.3 The City may deduct from the Contract Price, or any amounts due to the Contractor, the costs associated with the City Representative being called upon to perform more than one inspection for the purpose of determining Substantial Performance, when in the opinion of the City Representative, the Work was clearly not yet substantially complete.

5.3.4 The certificate of Substantial Performance shall establish the date of Substantial Performance and shall fix the time within which the Contractor shall complete or correct all items on the list accompanying the certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Performance, unless otherwise provided, in the certificate of Substantial Performance.

5.3.5 Similarly, in accordance with the procedure set out above, the City Representative may in its absolute discretion, issue a Certificate of Substantial Performance in respect of any part of the Work which has been both completed to the satisfaction of the City Representative and which the City has elected to occupy or use prior to completion.

5.3.6 In addition to other holdbacks as provided by the Contract Documents, when considering Substantial Performance, the City may hold back from payments otherwise due to the Contractor the amount that is two times of the amount of a reasonable estimate, as determined by the City Representative, on account of deficient or defective Work already paid for. This holdback may be held, without interest, until such deficiency or defect is remedied. The items of defect or deficiency and the amounts of related holdback shall be listed separately on the payment certificate.

5.4 FINAL COMPLETION

5.4.1 Following Final Completion of the Work, including any testing, the Contractor shall provide the City Representative with the following:

.1 a statutory declaration as referred to in GC 3.23.2 that:

a. the Work has been completed in accordance with the Contract Documents; and
b. no claims exist or alternatively setting out the particulars of any claims relating to personal injury or death or property loss or damage arising out of the Work, and any alleged infringement by the Contractor of a patent or other property right in performing this Contract; and

.2 particulars of, or a waiver of, all outstanding claims against the City, arising out of the Work.

5.4.2 Following receipt of the documents referred to in GC 5.4.1, the City Representative shall, with reasonable promptness, conduct an inspection and assessment of the Work to verify that the Work has been completed in accordance with the Contract Documents. Within ten (10) business days of receipt of the above documents, the City Representative shall either issue a certificate of Final Completion to the City and the Contractor or a list of items to be completed or rectified, of which the City Representative is aware. The City may deduct from monies owed to the Contractor the costs associated with the City Representative being called upon to perform more than one inspection.

5.4.3 Receipt by the Contractor of the certificate of Final Completion shall entitle the Contractor to payment in accordance with GC 5.5.

5.5 FINAL PROGRESS PAYMENT

5.5.1 The final progress payment certificate will be prepared following the issuance of the certificate of Final Completion. The final progress payment certificate will show the total amount payable to the Contractor, less any amounts retained and include the final WSCC Clearance Certificate.

5.5.2 The final progress payment amount shall be paid by the City to the Contractor within thirty (30) calendar days following receipt by the City of the final progress payment certificate.

5.6 HOLDBACK RELEASE

5.6.1 Forty-five (45) calendar days following the date of the issuance of the certificate of Substantial Performance by the City Representative, the Contractor may apply to the City for release of fifty percent of the Lien Holdback. The Contractor shall with such application provide the City Representative with a statutory declaration as referred to in GC 3.23.2, with the content referred to in GC 5.4.1.1, and the particulars of a waiver of, all outstanding claims against the City, arising out of the Work. The City Representative shall, within ten (10) business days' receipt of the Contractor's application, issue a Holdback Payment Certificate or a list of items to be rectified prior to payment.

5.6.2 Following the release of fifty percent of the Lien Holdback in accordance with GC 5.6.1, the Contractor may apply in writing for release of the remainder of all Contract lien holdback funds retained by the City, provided an irrevocable letter of credit, in a form acceptable to the City and from a bank and branch acceptable to the City, for the same amount is presented for the City's consideration. The City may, in its absolute discretion, accept or reject the Contractor's irrevocable letter of credit in place of the remainder of all Contract holdback funds.

5.6.3 The irrevocable letter of credit referred to in this provision must be for the same amount as the remainder of all Contract lien holdback funds and must remain in place until expiry of the warranty period referred to in GC 11.4. Should the Contractor's irrevocable letter of credit be scheduled to expire prior to the end

of such warranty period, the City may, at any time within the ten (10) business days prior to the expiry date, call upon and draw down the irrevocable letter of credit, unless the Contractor presents a renewal thereof with an expiry date be beyond the warranty period.

5.6.4 One year following the date of the issuance of the Certificate of Substantial Performance by the City Representative, the Contractor may apply to the City for release of the remainder of all Contract holdbacks or the return of irrevocable letters of credit, if any. The City Representative shall, within ten (10) business days of receipt of the Contractor's application, issue a Holdback Payment Certificate or a list of items to be rectified prior to payment.

5.6.5 The City may withhold from monies owing to the Contractor, an amount equal to the City Representative's estimate of the value of all outstanding deficiencies.

5.6.6 Subject to any applicable lien legislation requirements, holdback payments shall become payable or irrevocable letters of credit shall be returned by the City to the Contractor, within thirty (30) calendar days following receipt by the City of the Holdback Payment Certificate.

5.7 DELAY IN MAKING PAYMENT

5.7.1 Delay by the City in making payments when they are due pursuant to this provision shall not be a breach of this Contract by the City.

5.7.2 Unless otherwise stated in this Contract, when the City delays in making a payment that is due pursuant to this clause, the Contractor shall be entitled to receive simple interest on the amount that is overdue, at the prime lending rate of the main banker of the City.

5.8 RIGHT OF SET-OFF

Without limiting any right of set-off or deduction given or implied by law or elsewhere in the Contract Documents, the City may set-off any amount payable to the City by this Contractor against any amount payable to the Contractor under this Contract.

6. TIME AND DELAYS

6.1 TIME OF THE ESSENCE

Time is of the essence of this Contract, including without limitation the dates and time limits stated in the Contract Documents. By executing this Contract, the Contractor confirms that this Contract Time is a reasonable period for performing the Work.

6.2 DELAYS

6.2.1 Where a delay occurs in the progress of the Work and:

.1 the delay is attributable to or within the control of the Contractor or its Subcontractors or was reasonably foreseeable by them at the time this Contract was entered into, the Completion Date will not be adjusted. The Contractor will be liable to the City for all costs and expenses incurred by the City, as well as for any losses resulting from the City's inability to utilize the Work for its intended purpose resulting from the delay, and the City may deduct such costs from payments owing to the Contractor under this Contract;

.2 the delay is due to an act or neglect by the City, the City Representative, or other contractor, or of an employee of any of them, then the Contractor may make a Claim therefor, in accordance with GC 9.1, or

.3 the cause for the delay does not fall within the circumstances described in 6.2.1 or 6.2.2 above, the Contractor may make a Claim for an Adjustment in the Contract Time (but not for an Adjustments of the Contract Price), in accordance with GC 9.1. This shall be the Contractor's sole and exclusive remedy for such delays.

6.2.2 In no event will adverse weather be considered to be a cause of delay beyond the Contractor's or its Subcontractors' control or not reasonably foreseeable by them at the time this Contract was entered into.

7. ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

7.1 LATE COMPLETION

7.1.1 For the purposes of this General Condition, “period of delay” means the number of days commencing on the Completion Date fixed by the Articles of Agreement and ending on the day immediately preceding the day on which the certificate of Substantial Performance is issued but does not include any day within a period of extension granted pursuant to GC 9.1 and 6.2, or any other day on which, in the opinion of the City Representative, completion of the Work was delayed for reasons beyond the control of the Contractor.

8. CHANGE ORDERS

8.1 CHANGES IN THE WORK

8.1.1 Without invalidating this Contract, the City may, through the City Representative, direct in writing the Contractor to make changes in the Work by adding to, deleting from or revising the Work.

8.1.2 When no Change Order has been issued by the City Representative, and the Contractor claims that any of the Work being performed or proposed constitutes a change in the Work entitling the Contractor to an Adjustment, the Contractor may make a Claim therefore in accordance with GC 9.1.

8.1.3 Changes in the Work directed by the City shall not be initiated, and shall not be carried out by the Contractor, without the prior written authorization of the City through the City Representative.

8.1.4 Upon receipt of an approved Change Order from the City Representative, the Contractor shall promptly proceed with the Work involved under the applicable provisions of the Contract Documents, except as specifically provided in the Change Order.

8.1.5 The City Representative may in writing direct the Contractor to proceed with the Change notwithstanding that a Change Order has not been prepared or agreed at the time of such direction, and upon receipt of such direction the Contractor shall promptly proceed with the Work as aforesaid. If the parties fail to agree upon the price for such Change, the price therefor shall be as set out in GC 8.2.6 or 8.2.9, as applicable.

8.1.6 If notice of any change in the Work is required by the provisions of any bond to be given to a surety, the Contractor will be responsible for giving such notice, and the amount of each applicable bond shall be adjusted accordingly. For the purposes of this provision, the Contractor will be considered to be the surety's agent.

8.2 VALUATION OF CHANGES

8.2.1 When a change results in a decrease in the Work, the Contract Price shall be decreased by an amount to be determined by the City Representative, with such decrease valued in the same manner as if it were an increase.

8.2.2 When a change causes an increase in the Work, the Contract Price shall be increased in accordance with this provision.

8.2.3 If this Contract specifies unit prices for changes to the Work, and the City Representative concurs in their use on a particular change or portion thereof, then the Contractor shall be paid for such change or portion, a sum determined by applying the unit prices to the actual quantum, as measured by the City Representative, determined after completion of the Change.

8.2.4 Where this Contract specifies force account rates for labour, equipment and materials, and the City Representative concurs in their use on a particular change or portion thereof, then the Contractor shall be paid for such change or

portion, a sum determined by applying the force account rates to the number of hours of labour and equipment expended and quantities of materials utilized. The Contractor shall present records of the work done to the City Representative for approval, at the times and in the manner specified by the City Representative.

8.2.5 If there are changes, or portions of changes, for which unit prices or force account rates are not applicable or specified, then the Contractor shall propose to the City Representative a fixed price for such changes or portions. Upon agreement by the City on the amount thereof, the proposed fixed price shall become the sum the Contractor shall be paid for such change or portion.

8.2.6 If the Contractor and the City are unable to agree on a fixed price, then the Contractor shall be reimbursed its costs for performing the changes as directed by the City Representative, consistent with the following:

.1 wages, salaries and travelling expenses of the Contractor's employees while actually engaged on the Work, excluding any and all expenses of head office personnel;

.2 workers' compensation assessments, unemployment insurance premiums, pension plan payments and paid holidays;

.3 rental cost of machinery and equipment that is used in the performance of the Work, or an allowance for depreciation if owned by the Contractor;

.4 operation and maintenance costs for machinery and equipment used in the performance of the Work, other than costs of repairs arising out of defects existing before it was brought on to the Site;

.5 cost of materials necessary for and incorporated into the Work or consumed in the performance of the Work;

.6 cost of premiums for all bonds and insurance;

.7 other expenses incurred by the Contractor as approved in advance by the City Representative for the proper performance of the Work;

.8 Subcontractor costs calculated in accordance with GC 8.2.6.1-.7 above; and

.9 an allowance for profit and all other expenditures or costs, including overhead, general administration costs, financing and interest charges, and every other cost, charge and expense, in an aggregate amount that is equal to twenty percent of the expenses referred to in GC 8.2.6.1-.7, and equal to ten percent of the expenses referred to in GC 8.2.6.8 above.

8.2.7 Whenever the cost of any Work is to be determined in accordance with GC 8.2.6, the Contractor will establish and maintain records in accordance with GC 3.26.

8.2.8 Pending final determination of cost, amounts not in dispute shall be included in progress payments.

8.2.9 If the method of valuation of any increase cannot be promptly agreed upon, the City Representative shall determine the method of valuation and issue a written authorization for the change setting out the method of valuation.

8.3 CONTINGENCY ALLOWANCE

8.3.1 The Contract Price includes the contingency allowance, if any, stated in the Contract Documents.

8.3.2 Expenditures under the contingency allowance shall be authorized in the same manner as for a Change Order in accordance with GC 8, and the value shall be determined in accordance with GC 8.2.

8.3.3 The unexpended portion of the contingency allowance shall be credited to, and paid to, the City as a condition of achieving Substantial Performance, unless otherwise agreed to by the City.

9. DISPUTE RESOLUTION

9.1 CITY REPRESENTATIVE'S DECISION

9.1.1 Where a Claim arises out of, or in connection with this Contract or the performance of the Work, whether during the performance of the Work or after its completion and whether before or after termination of this Contract, the Claim shall, in the first place, be referred in writing to the City Representative in accordance with this provision.

9.1.2 A written notice stating the general nature of the Claim shall be delivered by the party making the Claim to the other party and to the City Representative promptly, and in no event later than five (5) business days after the occurrence of the event giving rise to the Claim. Any Work for which a Claim has been made, shall be kept readily accessible and shall not be covered up without the express permission of the City Representative.

9.1.3 Notice of the extent of the Claim with supporting data shall be delivered within ten (10) business days after such occurrence. The Contractor shall keep contemporaneous records as may reasonably be necessary to support the Contractor's Claim, which may be inspected by the City Representative, as he deems necessary.

9.1.4 The City Representative shall review the information submitted, consult with the parties and make reasonable efforts to obtain agreement between the City and the Contractor regarding the Claim. The parties agree that, both during and after the performance of the Work, each of them shall use their best efforts to resolve any disputes arising between them by amicable negotiations, and shall provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate those negotiations. The City Representative may request the parties to refer the matter to more senior levels of management within their organizations, in an effort to resolve the Claim.

9.1.5 Where the City and the Contractor reach an agreement on the Claim, the City Representative will, where appropriate, prepare a Change Order for the City's approval, which shall be sufficient to effect a change in this Contract, in accordance with the terms of the Change Order and the Contract Documents.

9.1.6 If the City and the Contractor cannot reach an agreement regarding the Claim, the City Representative shall decide the matter and notify the parties in writing of his decision, within ten (10) business days of the last submission, and in no event later than twenty (20) business days following the date of the occurrence giving rise to the Claim. Valuation of Adjustments in the Contract Price shall be determined by the City Representative in accordance with GC 8.2.

9.1.7 Unless this Contract has already been terminated, the Contractor shall, in every case, roceed with the Work with all due diligence and the City and the Contractor shall give effect forthwith to every such decision of the City Representative unless and until the same shall be revised, as hereinafter provided.

9.1.8 Where either party disputes the decision of the City Representative or where the City Representative fails to notify the parties of his decision in accordance with GC 9.1.6 then either party may, within ten (10) business days, notify the other party of its intention to refer the matter to the Referee in accordance with GC 9.2 or Arbitrator in accordance with GC 9.3, as application. No referral may be made unless such notice is given. Notices shall be copied to the City Representative for information.

9.1.9 If the City Representative has given notice of his decision as to a matter in dispute to the parties and no notice of intention to refer the matter to the Referee has been given by either the City or the Contractor within twenty (20) business days, the City Representative's decision shall become final and binding upon the parties.

9.1.10 No act by the claimant shall be construed as a renunciation or waiver of any of its rights or recourses provided the claimant has given the required notices and carried out the instructions specified. The presentation of a Claim shall not be grounds for delay or interruption of the Work.

9.2 APPOINTMENT OF REFEREE

9.2.1 If the City and the Contractor agree to appoint a Referee, the City and the Contractor shall name, within twenty (20) business days of the parties signing this Contract, a Referee who may be called upon during the performance of, or after the completion of the Work, to settle any Claims or disputes arising under this Contract. Where the Referee appointed in accordance with this provision refuses to act, is incapable of acting or dies, the parties shall name a new Referee at the earliest opportunity. Should the parties be unable to agree on a Referee within the time specified, the City Representative whose decision shall be final, shall name a Referee.

9.2.2 Where either party has disputed a decision of the City Representative in accordance with GC 9.1.8, the Referee shall review the decision of the City Representative and may, if he deems it appropriate, require the parties to supply him with further information or documentation, giving each party an opportunity to respond. The Referee may inspect the Work after giving reasonable notice to each party of the time he intends to do so.

9.2.3 Not later than twenty (20) business days after receipt of the last documentary submission, where the matter has not been resolved in accordance with GC 9.2.2, the Referee shall issue his written decision with reasons to the parties.

9.2.4 The costs of retaining the Referee shall be shared equally between the City and the Contractor, unless the Referee directs otherwise. The City may deduct such costs assessed against the Contractor by the Referee, from any amount due and payable by the City to the Contractor under this Contract.

9.3 APPOINTMENT OF ARBITRATOR

9.3.1 If the parties agree to appoint a Referee, then within ten (10) business days after the Referee has rendered his decision, either party may, by written notice

to the other party and to the City Representative for information, refer the decision of the Referee to arbitration pursuant to this GC 9.3. If the parties have not agreed to appoint a Referee, then within the fourteen-day period referred to in GC 9.1.8, either party may refer to decision of the City Representative to arbitration pursuant to this 9.3. Upon any such referral, the parties shall appoint a single Arbitrator, for arbitration in accordance with the Arbitration Act, R.S.N.W.T. (Nu) 1988, c. A-5, as duplicated for Nunavut by s. 29 of the Nunavut Act, subject to the following provisions:

.1 the Arbitrator shall have the authority to call upon the Referee to give evidence during the arbitration proceedings, including all documentation prepared by the Referee or reviewed by him;

.2 the decision of the Arbitrator shall be final and binding upon the parties who covenant that their disputes shall be so decided by arbitration alone and not by recourse to any court by way of action at law;

.3 arbitration proceedings may be commenced prior to or after completion of the Work, provided that the obligations of the City, the City Representative and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Work;

.4 before the arbitration proceeds on the substantive issues, a budget for the proceedings shall be established by the Arbitrator and each party shall deposit, as security for costs, a sum equal to half of such budget with the Arbitrator, who shall thereupon deposit such funds in an interest bearing trust account with a chartered bank. Subject to the award and payment of costs as hereinafter provided, the balance of the security deposits and interests shall be properly returned to the respective parties; and

.5 the cost of arbitration may be awarded against the parties hereto or against any one of them as the Arbitrator may decide.

9.3.2 If a Claim involves the Work of a Subcontractor, either the City or the Contractor may join such Subcontractor as a party to the arbitration between the City and the Contractor. The Contractor shall include in all its subcontracts specific provision whereby its Subcontractors consent to being joined in an arbitration between the City and the Contractor involving the Work of such Subcontractors. Nothing in this provision nor in the provision of such subcontracts consenting to joinder shall create any claim, right or cause of action in favour of the Subcontractors as against the City or the City Representative, that does not otherwise exist.

9.3.3 If no notice is received within the time limits set out or referred to in GC 9.3.1, the decision of the Referee shall be final and binding on the parties.

9.3.4 The Contractor agrees that it shall join other arbitration proceedings with respect to the Project, as requested in writing by the City.

9.4 ADHERENCE TO PROVISIONS

9.4.1 The provisions, including without limitation, procedure and sequences, outlined in GC 9.1 to 9.3 for the resolution of disputes shall be strictly adhered to by both parties.

10. WITHDRAWAL, SUSPENSION AND TERMINATION

10.1 WITHDRAWAL OF THE WORK

10.1.1 After giving the Contractor five (5) business days written notice within which the Contractor may remedy any delay or default specified, the City may, through the City Representative, withdraw the Work from the Contractor where the Contractor is not diligently performing the Work to the satisfaction of the City Representative or has not completed the Work within the time specified in this Contract.

10.1.2 On withdrawal of the Work, the City may:

.1 take possession of all plant, equipment and materials on the Site and ordered by the Contractor for the Work but not yet delivered to the Site; and

.2 complete the Work withdrawn from the Contractor.

10.1.3 Withdrawal of the Work by the City does not terminate this Contract and does not relieve the Contractor of its obligation to complete the remainder of the Work.

10.1.4 The Contract Price will be reduced by the value of the Work withdrawn, as determined by the City Representative. The Contractor shall be liable to the City for all extra costs incurred by the City to complete the Work withdrawn from the Contractor, including all amounts set out in GC 10.3.4 notwithstanding that the Contractor may not be in default hereunder, and the City may deduct such costs from payments owing to the Contractor under this Contract.

10.2 SUSPENSION OF THE WORK

10.2.1 The City may through the City Representative suspend the progress of the Work at any time by giving the Contractor a written notice, which shall include the reason for the suspension.

10.2.2 Where such a suspension results in a delay in the progress of the Work, the rights of the parties shall be determined in accordance with GC 6.2.1 (.1), (.2) or (.3) as applicable, and shall be based on the reason for the suspension.

10.2.3 During the period of suspension, the Contractor shall protect, preserve and maintain the Work in a manner satisfactory to the City and shall not remove any part of the plant, equipment and materials from the Site without the prior written consent of the City.

10.2.4 Following the suspension, the Construction Schedule shall be revised by the Contractor, for approval by the City, and the Work shall be completed as provided in the revised schedule.

10.2.5 Where the Work or any part thereof is suspended on the written instructions of the City and if permission to resume Work is not given by the City within a period of within twenty (20) business days from the date of suspension, the Contractor may request permission from the City to proceed with the Work. If the City does not grant permission within ten (10) business days of receipt of the Contractor's

written request, the Contractor may elect to treat the suspension, where it affects only part of the Work, as an omission of such Work by giving a further notice to the City to that effect or, where it affects the whole of the Work, treat this Contract as having been cancelled by the City, in accordance with GC 10.4.

10.3 TERMINATION BY CITY

10.3.1 Without limitation, any or all of the following actions by or circumstances relating to the Contractor shall constitute default on the part of the Contractor:

.1 committing or threatening to commit any act of insolvency or bankruptcy, voluntary or otherwise;

.2 having a receiver appointed on account of insolvency or in respect of any property;

.3 making a general assignment for the benefit of creditors;

.4 failing to comply with or persistently disregarding statutes, regulations, bylaws or directives of competent authorities relating to the Work;

.5 failing to comply with any requests, instruction or direction of the City Representative;

.6 failing to pay accounts relating to the Work as they come due;

.7 failing to prosecute the Work with skill and diligence;

.8 assigning or subletting this Contract or any portion thereof without the required consent from the City;

.9 failing or refusing to correct defective or deficient Work; and

.10 being otherwise in default in carrying out any of its obligations under this Contract, whether such default is similar or dissimilar in nature to the causes listed previously.

10.3.2 The Contractor shall immediately advise the City in writing of any default listed in GC 10.3.1.

10.3.3 If the Contractor is in default under this Contract, the City shall be entitled to any or all of the following:

.1 take possession of all Work in progress, materials and construction equipment at the Site, at no additional charge for the retention or use of the construction equipment;

.2 eject and exclude from the Site all personnel of the Contractor and any Subcontractor;

.3 terminate the City's utilization of the Contractor to perform the Work;

.4 finish the Work by whatever means the City may deem appropriate under the circumstances; and

.5 withhold any further payments to the Contractor until the Contractor's liability to the City is ascertained.

10.3.4 The Contractor shall be liable to the City for:

.1 the extra expense of finishing the Work, including compensation to the City for additional engineering, managerial and administrative services;

.2 the cost of correcting deficiencies in that portion of the Work performed by the Contractor; and

.3 all other loss, damage and expense occasioned to the City by reason of the Contractor's default,

and the City may deduct such amounts from payments owing to the Contractor under this Contract.

10.3.5 Any action by the City under this GC 10.3 shall be without prejudice to the City's other rights or remedies under any security held by the City for performance of this Contract by the Contractor.

10.4 CONTRACT CANCELLATION

10.4.1 The City shall have the right which may be exercised from time to time, with or without cause, and on ten (10) business days written notice to the Contractor, to cancel any uncompleted or unperformed portion of the Work. In the event of such cancellation, the Contractor shall be entitled to the following:

.1 reimbursement at this Contract rate for all items completed and delivered;

.2 reimbursement for the costs to the Contractor for Work in progress and expenses incurred in the course of the Work, plus a reasonable return on such costs and expenses; and

.3 reimbursement for costs and expenses directly caused by the cancellation.

10.4.2 Title to all Work for which reimbursement is made shall vest in the City.

10.4.3 The City shall not be liable to the Contractor for indirect loss, consequential loss, loss of business opportunity or loss of anticipated profit on the cancelled portion or portions of the Work.

10.4.4 This section shall not apply to situations in which the City is entitled to terminate this Contract by reason of default by the Contractor.

10.5 TERMINATION BY CONTRACTOR

10.5.1 If the City should be adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the City's insolvency, or if a receiver is appointed because of the City's insolvency, the Contractor may, without prejudice to any other right or remedy the Contractor may have, by giving the City or receiver or trustee in bankruptcy notice in writing, terminate this Contract.

10.5.2 If the Work should be stopped or otherwise delayed for a period of within twenty (20) business days or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the Contractor or of anyone directly or indirectly employed or engaged by the Contractor, the Contractor may, without prejudice to any other right or remedy

the Contractor may have, by giving the City notice in writing, terminate this Contract.

10.5.3 If the Contractor terminates this Contract under the conditions set out above, the Contractor shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon products and construction machinery and equipment, and such other damages as the Contractor may have sustained as a result of the termination of this Contract.

11. BONDS AND WARRANTY

11.1 OBLIGATIONS TO PROVIDE CONTRACT SECURITY

11.1.1 The Contractor shall promptly provide to the City the surety bonds called for in the Contract Documents, not later than ten (10) business days following receipt by the Contractor of the letter of acceptance.

11.1.2 Such bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in Nunavut and shall be maintained in good standing until the fulfillment of this Contract.

11.1.3 Prior to or at the time of making a Claim under such bonds, the City shall send written notification to the Contractor, stating the nature of the default for which a Claim is being made.

11.2 PRESCRIPTION OF ACCEPTABLE CONTRACT SECURITY

11.2.1 The Contractor shall deliver to the City:

.1 a performance bond and a labour and material payment bond each in an amount that is equal to and not less than fifty percent of the Contract Price referred to in the Articles of Agreement; or

.2 a security deposit in an amount that is equal to ten percent of the Contract Price referred to in the Articles of Agreement.

11.2.2 The performance bond and the labour and material payment bond referred to in GC 11.2.1.1 shall be in a form as approved by the Federal Treasury Board (Federal Contracts).

11.2.3 A security deposit referred to in GC 11.2.1.2 shall be in a form of:

.1 an irrevocable letter of credit in a form acceptable to the City and from a bank and branch acceptable to the City; or

.2 a certified cheque or bank draft from a bank acceptable to the City and made payable to the City.

11.2.4 Should the Contractor's irrevocable letter of credit be scheduled to expire prior to the Completion Date set out in the Articles of Agreement, the City may, at any time within the ten (10) business days prior to the expiry date, call upon and draw down the irrevocable letter of credit, unless the Contractor presents a renewal thereof with an expiry date beyond the anticipated date for Final Completion, as determined by the City Representative.

11.3 RETURN OF SECURITY DEPOSIT

11.3.1 Following issuance of the certificate of Substantial Performance, the City may, in its absolute discretion, release all or part of the security deposit referred to herein.

11.3.2 Following issuance of the certificate of Final Completion, the Contractor shall, subject to the terms of this Contract, be entitled to the remainder of any security deposit.

11.3.3 Interest shall not be paid on security deposits.

11.4 WARRANTY

11.4.1 The Contractor warrants and guarantees that the Work is and shall be free from all defects or deficiencies in, or arising from, materials or workmanship in any part of the Work for the period of one year from the date of Substantial Performance of the Work, as certified by the City Representative, or such longer period as may be specified in the Contract Documents for certain products or Work.

11.4.2 The Contractor shall promptly correct, at its own expense, defects or deficiencies in the Work which appear prior to and during the warranty described in GC 11.4.1. The Contractor shall correct and pay for all damages resulting from corrections made under this provision.

11.4.3 Work performed to correct defects or deficiencies shall be warranted and guaranteed to be free from defects or deficiencies, on the same basis as the original Work, for a period of one year from the day said work was completed.

11.4.4 The City or the City Representative shall promptly give the Contractor written notice of observed defects and deficiencies.

11.4.5 If any defects or deficiencies in the Work appear at any time prior to the end of the warranty period, the City Representative may instruct the Contractor to search for the cause thereof. If such defect or deficiency is one for which the Contractor is liable, the cost of the Work carried out in searching shall be at the Contractor's expense, and it shall in such case remedy such defect or deficiency at its own cost; otherwise it shall be at the City's expense.

11.4.6 In an emergency or to prevent an emergency or if the Contractor neglects for any reason to correct defects or deficiencies within a reasonable time, the City may perform the Work or direct another party, on the City's behalf, to do the Work. All costs associated with the correction of such defects or deficiencies shall be paid for by the Contractor and the City may deduct such costs from amounts owing to the Contractor.

12. INDEMNIFICATION AND INSURANCE

12.1 INDEMNIFICATION BY CONTRACTOR

12.1.1 The Contractor shall defend, indemnify and save harmless the City and the City Representative, their agents and employees from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the Work, or by reason of any matter or thing done, permitted or omitted to be done, by the Contractor, its Subcontractors, its Suppliers or their agents or employees, whether occasioned by negligence or otherwise. Such indemnity shall survive completion or termination of this Contract.

12.1.2 Nothing contained in the Contract Documents or any approval, express or implied, of the City Representative or City shall relieve the Contractor of any liability for latent defects or any liability which may be imposed by law.

12.2 INDEMNIFICATION BY CITY

The City shall, subject to any law that affects the City's rights, powers, privileges or obligations, indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of his activities under this Contract that are directly attributable to:

12.2.1 lack of or a defect in the City's title to the Site whether real of alleged; or

12.2.2 an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of this Contract employing a model, plan or design or anything related to the Work that was supplied by the City to the Contractor.

12.3 POLICIES OF INSURANCE

Without restricting the generality of GC 12.1, the Contractor shall provide and maintain the insurance coverages listed in this provision. Unless otherwise stipulated, the duration of each insurance policy shall be from the date of commencement of the Work until the date of issuance of the certificate of Final Completion. Prior to commencement of the Work, the Contractor shall provide the City with confirmation of coverage in the format attached as Appendix A to these General Conditions, and, if required, a certified true copy of the policies certified by an authorized representative of the Insurer. The Contractor shall ensure that any Subcontractors comply with the insurance requirements outlined in this GC 12. The insurance coverages required are as follows:

12.3.1 <u>General Liability Insurance</u>

Contractor's comprehensive general or commercial general liability insurance shall have limits of not less than **five million dollars ($5,000,000)** per occurrence with a property damage deductible not exceeding **two thousand five hundred dollars ($2,500).** The insurance provided shall be no less broad than the insurance provided by IBC Form 2100 or its equivalent replacement and shall include a standard non-owned automobile policy including a blanket

contractual liability endorsement. To achieve the required limit, umbrella or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of Final Completion of the Work, as set out in the certificate of Final Completion, on an ongoing basis for a period of not less than six years from the date of such certificate.

The City shall be added as an additional insured with respect to liability arising out of the operations of the named insured. The policy shall be endorsed to provide the City with not less than thirty (30) calendar days' written notice in advance of any cancellation, change or amendment restricting coverage.

12.3.2 Automobile Liability Insurance

Automobile liability insurance in respect of licensed vehicles shall have limits of not less than **five million dollars ($5,000,000)** inclusive per occurrence for bodily injury, death, and damage to property and covering all licensed vehicles owned or leased by the Contractor, endorsed to provide the City with not less than fifteen (15) calendar days' written notice in advance of any cancellation, change or amendment restricting coverage.

12.3.3 Property and Boiler and Machinery Insurance

.1 "All risks" property insurance shall be in the joint names of the Contractor, the City and the City Representative, insuring not less than the sum of the amount of the Contract Price and the full value of all labour, tools, equipment and materials that are to be provided by the City for incorporation into the Work, with a deductible not exceeding **two thousand five hundred dollars ($2,500).** The insurance provided shall be no less broad than the insurance provided by IBC Form 4042 or its equivalent replacement. The policy will contain a waiver of rights of subrogation against all those insured by the policy. Such coverage shall be maintained continuously until the date the certificate of Final Completion is issued or an earlier date specified by the City;

.2 the policy will allow for partial or total use or occupancy of the Work. If because of such use or occupancy the Contractor is unable to provide coverage, the Contractor shall notify the City in writing prior to such use pay for property and, if necessary, boiler insurance insuring the full value of the Work as in 12.3.3.1 above, including coverage for such use or occupancy and shall provide the Contractor with proof of such insurance. The Contractor shall refund to the City the unearned premium applicable to the Contractor's policy upon termination of coverage;

.3 where, due to the nature of the Work, the full insurable value of the Work is substantially less than the Contract Price, the City may, at its sole discretion, reduce the amount of insurance required or waive the course of construction insurance requirement;

.4 where such risks exist, the Contractor shall provide boiler and machinery insurance insuring not less than the replacement value of boilers, pressure vessels and other objects insurable under a boiler & machinery policy and forming part of the Work;

.5 the policies shall provide that, in the event of a loss or damage, payment shall be made to the City and the Contractor as their respective interests may appear. The Contractor shall act on behalf of the City for the purpose of claiming the amount of loss or damage from the Insurers. When the extent of the loss or damage is determined, the Contractor shall proceed to restore the Work. Loss or damage shall not affect the rights and obligations of either party under this Contract except that the Contractor shall be entitled to such reasonable extension of Contract Time relative to the extent of the loss or damage in accordance with the terms of this Contract; and

.6 the Contractor shall be responsible for deductible amounts under the policies except where such amounts may be excluded from the Contractor's responsibility in accordance with the Contract documents.

12.3.4 Aircraft and Watercraft Liability Insurance

Where such risks exist, the Contractor shall obtain aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft if used directly or indirectly in the performance of the Work, including use of additional premises, and shall have limits of not less than **two million dollars ($2,000,000)** inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof, and limits of not less than two million dollars for aircraft passenger hazard. Such insurance shall be in a form acceptable to the City. The policies shall be endorsed to provide the City with not less than fifteen (15) calendar days' written notice in advance of any cancellation, change or amendment restricting coverage.

12.3.5 Contractor's Equipment Insurance

The Contractor shall give proof of insurance in a form acceptable to the City of "all risks" Contractor's equipment insurance coveting construction machinery and equipment used by the Contractor for the performance of the Work, including boiler insurance on temporary boilers and pressure vessels. The insurance shall be in a form acceptable to the City and shall not allow subrogation claims by the insurer against the City. The policies shall be endorsed to provide the City with not less than fifteen (15) calendar days' written notice in advance of cancellation, change or amendment restricting coverage.

12.3.6 Other Insurance

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

12.3.7 Insurance General

.1 All required insurance policies shall be with insurers licensed to underwrite insurance in Nunavut and signed by representatives licensed to do so for insurance in Nunavut.

.2 The Contractor shall require and ensure that its Subcontractors maintain liability insurance comparable to that required above.

.3 If the Contractor fails to provide or maintain insurance as required by this General Condition or elsewhere in the Contract Documents, then the City shall have the right to provide and maintain such insurance and give evidence to the Contractor and the City Representative. The Contractor shall pay the cost thereof to the City on demand or the City may deduct the costs from monies which are due or may become due to the Contractor.

.4 Where an insurer fails or refuses to pay any claims under an insurance policy covering the activities of the Contractor or a Subcontractor relating to or arising out of the Work, the Contractor shall not be released from any liability arising under this Contract.

13. LOCAL AND INUIT INVOLVEMENT

13.1 REQUIREMENTS FOR INUIT, LOCAL AND NUNAVUT CONTENT

13.1.1 The Contractor shall, in the performance of the Work, employ Inuit, Local and Nunavut workers and use Inuit, Local and Nunavut content to the greatest extent possible. Workers shall meet all levels of proficiency, qualification and expertise as dictated by Applicable Laws and/or as defined in the Contract Documents.

13.1.2 The Contractor shall provide to the City Representative a schedule indicating the anticipated total monthly value of all Inuit, Local and Nunavut content and labour to be expended in the execution of the Work. This schedule shall provide the benchmark for ensuring compliance by the Contractor with the requirements for the use of Inuit, Local and Nunavut content during the performance of the Work.

13.2 REQUIREMENT FOR COMMUNITY MEETINGS

13.2.1 If required under this RFT (if the NNI Policy applies), The Contractor shall arrange meetings on a monthly basis, or other basis as may be mutually agreed by the parties to this contract, to monitor the use of Inuit, Local and Nunavut labour and Inuit, Local and Nunavut content. The Contractor shall give the City five (5) business days' notice of all meetings called under GC 13.2. The Contractor shall take reasonable steps to ensure that these meetings include the following representatives:

.1 a community representative who has been designated to speak on behalf of the community (if available);

.2 a community manpower representative (if available);

.3 the Contractor; and

.4 the City Representative.

13.2.2 In addition to the community meetings contemplated in GC 13.2.1, the Contractor shall arrange a community meeting prior to the start of the Work which shall be arranged on the same terms as indicated in GC 13.2.1 and at that meeting shall:

.1 provide a schedule referred to in GC 13.1.2 above to the community representative;

.2 request from the community manpower representative or from the City if no community manpower representative has been delegated, a list of workers available in the community; and

.3 identify specific types of workers required during the project such as plumbers, painters or electricians and how many of those workers are required and when they are required and based on information received in accordance with GC 13.2.2.2 maintain a list of community manpower.

13.2.3 At the community meetings contemplated in GC 13.2.1, the Contractor shall:

.1 provide employment reports identifying workers used during the past month;

.2 provide a schedule referred to in GC 13.2.2.1, or such schedule as amended, if necessary; and

.3 provide a consolidated report at the time of Substantial Performance, which shall confirm the total amount of Inuit, Local and Nunavut content used. This report will identify Inuit, Local and Nunavut payroll separately. This consolidated report shall be a condition precedent to the release of payment.

13.2.4 The City shall attend all community meetings organized by the Contractor in accordance with this GC 13.2 and when requested by the Contractor shall identify and contact potential community workers who may be available to be employed on the Work, identify alternate workers if those workers initially identified are not available to work, and assist in confirming the residency of local workers.

13.3 MONITORING THE LEVEL OF INUIT, LOCAL AND NUNAVUT LABOUR

13.3.1 The Contractor is responsible to ensure that every worker identified as Local or Nunavut meets the qualifying requirements, which are, for Nunavut, being ordinarily resident in Nunavut for the past 12 months, and for Local being a Nunavut resident ordinarily resident in the subject community for the past 4 months. The Contractor may be required to provide proof of residency of workers at any time throughout the course of performing the Work.

13.3.2 Reasonable proof of Nunavut and Local residency shall be any of the following:

.1 being listed on the Nunavut Tunggavik Inc. (NTI) enrolment list and provision of a physical address where residing;

.2 if the last 12 months have been spent as ordinarily resident in Nunavut and a physical address of such residence has been provided, then

a. provides a valid Nunavut Health Care Card effective at least 9 months prior to start date of employment on the Work; and/or

b. provides another accepted proof of residency such as: a Nunavut General Hunting License, a Nunavut Driver's Licence, a lease or rental receipt, or a certified Schedule T222 Income Tax return from the previous year or proof that Income Tax was paid in the Nunavut during the previous tax year; or

.3 is included on a list of approved Local or Nunavut residents verified by the municipality of their residence.

13.3.3 The Contractor is responsible to ensure that every worker identified as Inuit is on the NTI Inuit enrolment list or would qualify to be on the list.

13.3.4 If requested by the City to do so, the Contractor shall obtain a signed consent form from workers which verifies their residency and permits the City to obtain any and all information required to support the worker's claim of residency

and/or Inuit status. A worker does not need to comply with the requirements of this clause if the worker is on the NTI Inuit enrolment list.

13.4 REQUIREMENT FOR USING HOTELS OR BED AND BREAKFAST

13.4.1 If performance of the Work is undertaken where a Commercial Room and Board Facility (as defined below) exists within a Community (as defined below), the Tenderer is required to use a Commercial Room and Board Facility to house and feed all workers directly employed by the Contractor, any Subcontractor or agent or any other business working on the Project. The Contractor, Subcontractor, agent or other business are not required to use Commercial Room and Board Facilities for workers who are Local Residents.

13.4.2 In this Contract:

.1 "Commercial Room and Board Facility" means a Hotel or a Bed and Breakfast (Tourist Home) that holds a Tourist Establishment Licence issued by the Government of Nunavut under the Travel and Tourism Act.

.2 "Community" means a community in which the Work (as defined in the Contract) is being performed and includes the entire area within a 20-kilometer radius of that community.

13.4.3 The Commercial Room and Board Facility must:

.1 meet the applicable requirements under the *Public Health Act*, and of the *Eating or Drinking* Place Regulations; and

.2 meet all applicable requirements of the *Public Health Act* the *Fire Prevention Act* and applicable regulations thereunder, and any other applicable Government of Nunavut or federal legislation.

14. TRANSPORTATION OF MATERIALS

14.1 MARINE TRANSPORT RESOURCES

14.1.1 Whenever marine (water) transport is to be utilized, the Contractor may use, and space may be booked directly with the following carrier:

.1 Nunavut Sealink and Supply (NSSI),

.2 By ships loading at the Montreal area Port of Ste-Catherine

.3 Nunavut Eastern Arctic Shipping (NEAS)

.4 By ships loading at the Port of Valleyfield, Salaberry-de-Valleydfield

14.1.2 The annual shipping rates offered by marine carriers are dependent upon anticipated cargo quantities including the materials for construction projects; therefore, Contractors may tender using the published sailing schedules and rates available from the above marine carriers.

14.1.3 In exceptional or extraordinary circumstances, where the specified marine carrier's sailing schedule is in substantial conflict with the Construction Schedule, the City will review the circumstances, taking into account the adverse impact on the project and the specified marine carrier's interests, and the City may provide authorization to allow the relevant cargo to be shipped with a marine carrier other than the specified marine carrier, depending upon the circumstances; and such authorization must be writing.

14.1.4 If a Contractor uses a marine carrier other than the City contracted marine carrier without the City's written authorization to do so, the Contractor shall be responsible for extra freight cost, administrative costs or any other costs, incurred by the City which result directly or indirectly from the Contractor's failure to use the City specified marine carrier as set out in this GC 14. The Contractor shall also be responsible to refund to the City any monies saved by the Contractor by using a marine carrier other than the specified marine carrier as set out in this GC 14.

END OF SECTION

Amend the General Conditions as follows:

Amend Section 4 – Administration by City Representative as follows:

Add Section 4.4 HOLD POINTS

4.4 HOLD POINTS

.1 The Contractor shall notify the Engineer and the City, in writing, a minimum of three (3) working days in advance of each hold point review.

.2 The Contractor shall not proceed with work beyond a listed hold point until the work has been reviewed and accepted by the Engineer and/or the City, as applicable.

.3 Failure to provide the required notice shall not be cause for a delay claim. The Contractor shall coordinate the Work and schedule hold point reviews in advance to avoid impacts to the construction schedule.

.4 Work completed beyond a listed hold point without the required review and acceptance may be rejected. The Contractor shall uncover, remove, replace, repair, or otherwise make good such Work as directed by the Engineer, at no additional cost to the Owner.

.5 The following hold points shall apply:

.1 **Culvert Channel Dewatering:** After dewatering of the culvert channel and prior to placement of piles, the Contractor shall notify the Engineer and the City to review the dewatered channel and confirm that the work area is suitable for pile installation.

.2 **Pile Installation:** After completion of pile installation and prior to construction or pouring of the grade beam, the Contractor shall notify the Engineer and the City to review the location, alignment, and elevation of each pile.

.3 **Concrete Placement:** Concrete shall not be placed until formwork, reinforcement, embedded items, and placement conditions have been reviewed and accepted.

.4 **Precast Culvert Placement:** Prior to installation of the precast concrete elements, the Contractor shall notify the Engineer and the City to review the precast units for cracks, damage, defects, or other faults that may have occurred during fabrication, handling, transportation, or storage.

.5 **Backfilling:** The Contractor shall notify the Engineer and the City to review the installed work prior to backfilling.

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1. SUMMARY OF WORK

1.1 DEFINITION

1.1.1 The City of Iqaluit is hereinafter and elsewhere in the Contract Documents referred to as the Owner. The contract documents may refer to “the Owner”, “the City of Iqaluit”, “the City” and “City”. All these have the same meaning as “the Owner”.

1.1.2 The contract documents may refer to “City Representative”, “Engineer”, “Consultant”, “Owners Agent” and “Contract Administrator”. All these have the same meaning as “City Representative”.

1.1.3 Where the word “provide” is used in any General Requirements sections or the Terms of Reference, it shall mean furnishing and incorporating a specified item, product, or material in the Works, including all necessary labour, materials, and equipment to perform the Work required, ready for use by the Owner.

1.2 GENERAL SUMMARY

1.2.1 Recognize that the Work under the Contract is to be performed in a facility, location, area that must be kept in continuous uninterrupted operation, or where municipal services must be maintained. Plan and schedule the Work consistent with specified operational constraints and with the objective of uninterrupted operation of the existing facility, structure, and/or service provided by the City.

1.2.2 Supervise, organize, coordinate and direct all construction operations described in the contract documents, regardless of the section in which the works are specified. The Contractor shall resolve conflicts arising between trades, sub-contractors, suppliers and/or other contractors working in the adjacent area.

1.2.3 Construct and test foundations, structures, pipelines, buildings, tanks, equipment and other facilities shown on the contract drawings and specified within the terms of reference.

1.2.4 Supply, install, calibrate and commission all mechanical, electrical, process, instrumentation and communication equipment shown on the contract drawings and specified within the terms of reference. Include operating assistance to the Owner as described.

1.2.5 In addition to constructing the works shown on the drawings and described within the terms of reference, design, construct, and maintain, unless otherwise specified on shown on the drawings or described in the terms of reference, all temporary works and facilities required for the construction of the works. Remove temporary works and facilities when construction is completed. Temporary works and facilities include, but are not limit to, the following:

.1 All security fencing whether permanent or temporary.

.2 Shoring and bracing systems for excavations whether part of all is left in place or not, shall be designed, approved and stamped by a Professional Engineer Licensed in Nunavut.

.3 Construction access roads and related items.

.4 Excavation and/or dewatering systems.

.5 Formwork for concrete.

.6 Falsework and bracing for formwork or for other parts of the works while under construction.

.7 Bracing and shoring for partially completed steelwork, precast concrete, existing structures and pipelines, or other assembly.

.8 Scaffolding.

.9 Temporary bypass pumping systems to divert flows away from the work area so that services are uninterrupted, while ensuring the work can be performed safely.

.10 Protection for existing structures and facilities as necessary for the construction to proceed.

.11 Temporary power and/or utilities necessary to existing City buildings and/or facilities, in order to ensure services are not interrupted as a result of the work.

.12 Curtains to control the migration of dust during work inside existing buildings, structures, and rooms.

.13 Temporary barriers and enclosures.

.14 Temporary utilities (water, power, light, instrumentation, heating, ventilation services and sanitary facilities, etc.).

.15 Piping and equipment support.

.16 Snow removal around the job site.

.17 Temporary vehicular access and parking development, maintenance, and restoration.

.18 Regrading of gravel roads affected by construction works.

1.2.6 Contractor to be responsible for all means and methods required to execute the work, as described in the Terms of Reference.

1.3 WORK BY OTHERS

1.3.1 Coordinate work of other Contractors. Report promptly to City Representative, in writing, any defects which may interfere with proper execution of the Work for this contract.

1.4 CODES AND PERFORMANCE REQUIREMENTS

1.4.1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of territorial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

1.4.2 Meet or exceed the requirements of:

.1 Contract documents.

.2 General requirements and terms of reference.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 Field Instructions and Change Orders.

.6 Other modifications to Contract.

.7 Field test reports.

.8 Copy of approved work schedule.

.9 Manufacturer's installation and application instructions.

1.5 WORK COMPLIANCE

1.5.1 Provide all work during its progress and at its completion to the lines, levels, and grades shown.

1.5.2 Build all work in a thoroughly substantial and workmanlike manner, in accordance with the Contract Drawings, General Requirements, and Terms of Reference, subject to such modifications and additions as may be deemed necessary during its execution. In no case will any work in excess of the requirements of the Drawings, General Requirements or Terms of Reference be paid for, unless approved in writing by the City Representative.

1.6 ENGINEER DESIGN

1.6.1 Where general requirements or terms of reference require work to be designed by an engineer, engage a professional engineer licensed in the Territory of Nunavut within demonstrated experience to design such work.

1.7 DOCUMENTS REQUIRED

1.7.1 Maintain at job site, one copy of each document as follows:

.1 Contract Documents

.2 Contract Drawings

.3 Addenda

.4 Reviewed Shop Drawings

.5 List of Outstanding Shop Drawings

.6 Change Orders

.7 Other Modifications to Contract

.8 Field Test Reports

.9 Copy of Approved Works Schedule

.10 Site Specific Health and Safety Plan and Other Safety Related Documents

.11 Current as-built document of construction work in progress

.12 Other documents as specified

.13 Permits

.14 All other Plans as required by the Contract documents (site shutdown plan, sediment and erosion control plan, emergency response plan)

1.8 SUBSTANTIAL COMPLETION

1.8.1 In addition to the requirements in the General Conditions and Supplementary General Conditions, Substantial Completion shall only be issued once the following requirements have been addressed to the satisfaction of the City Representative:

.1 Successful testing, start-up and commissioning of all equipment and/or systems specified in the Contract Documents.

END OF SECTION

2. CONTRACTORS USE OF PREMISES

2.1 DESCRIPTION

2.1.1 This Section specifies requirements for the Contractor's use of project site during the construction.

2.2 GENERAL

2.2.1 Normal working hours shall be Monday to Saturday, 7:00am to 7:00pm, excluding statutory holidays. No work shall be permitted outside of these hours within the Contractor first obtaining written approval from the City Representative and Owner, five (5) working days in advance of the planned work.

2.2.2 The Contractor shall arrange with the City for easements for construction, storage and access to all the Works within the Owner's property line.

2.2.3 Do not enter upon or occupy with workers, tools or materials any land other than public streets, roadways, rights-of-way or easements shown on the Contract Drawings except after written consent has been received from the property owner.

2.2.4 The Contractor shall obtain written approval from the City Representative for shutdown and tie-in work to existing facilities and structures. The City's staff will be responsible for operations of the existing facilities and structures during the construction period.

2.2.5 The Contractor shall obtain written approval from the City Representative for work that will be executed within a municipal right-of-way, and for partial or full closure of municipal roadways.

2.2.6 Do not impede normal operation of existing facilities and structures.

2.2.7 A temporary fence and access gate are to be erected to separate the work area from the plant operating area as specified herein and as directed by the City Representative.

2.3 STAGING AREA

2.3.1 The staging area will be identified on the contract drawings or provided by the City Representative at the pre-construction meeting. If the staging area is not identified on the Contract drawings, or provided by the City Representative, then the Contractor shall propose a staging area for the City's approval.

2.3.2 Locate construction trailers, laydown areas, and temporary buildings under the direction of the City Representative.

2.4 WORK AREA

2.4.1 Contractor shall clearly delineate the entire perimeter of his working area with a sturdy metal fence of at least 1.8m height, with sufficient access gates, complete with signage identifying company name, site contact telephone number, and emergency contact information prior to commencement of any work.

2.4.2 All points of entry into the Contractor's working area, including stair and walkways, shall be similarly controlled by sturdy barriers and signage. Do not impede emergency egress from any area.

2.4.3 Confine operations within easements for construction, storage and access.

2.4.4 Install, secure and maintain fencing along working and storage areas, access routes and both sides of easements.

2.4.5 Do not enter upon or occupy any land with labour, tools or materials other than the easements for construction except after written consent has been received from property owner.

2.4.6 Do not encumber site with materials or equipment.

2.4.7 Where the work takes place in different areas of the facilities, structures, or work areas at different times of the contract, a 'rolling' definition of working area can be utilized.

2.4.8 Install, secure and maintain jersey barriers or other heavy duty physical barriers to protect all trenches, excavations, and utilities.

2.5 STORAGE

2.5.1 Contractor shall provide suitable storage areas, as well as security if needed, for construction materials. Storage and security of construction materials will be the responsibility of the Contractor.

2.5.2 Contractor shall obtain permission from the City Representative before storing any materials in any new facility or work areas under construction.

2.5.3 Excess materials resulting from any or all excavations are the property of the Owner. Its disposal by the Contractor as part of the contract shall be as directed by the Owner unless the Owner waives this requirement. Under this circumstance, the contractor shall be responsible for the disposal of any or all of the excess materials.

2.6 ENTRY OF OWNER'S STAFF INTO CONTRACTOR'S WORKING LIMITS

2.6.1 The Owner may require access to the work site during the construction period for the purpose of maintaining normal operation of City infrastructure and services. Cooperate with the Owner in scheduling construction activities to facilitate the Owner's usage and to minimize conflict.

2.6.2 Maintain the entire works free of debris, snow and ice at all times, including access to all buildings, facilities and structures which continues to be operated and/or maintained by Owner's staff.

2.6.3 Prepare a written procedure regarding the entry of Owner's staff into the construction site and submit to the City Representative for review. The procedure must be communicated to all operating staff who may enter the construction site.

2.6.4 The existing facilities and/or structures operate 24 hours per day, 7 days per week. In the event of conflict between construction activities and general

operations, operations shall have priority. Take every precaution to avoid interfering within routine operation and maintenance.

END OF SECTION

3. COORDINATION

3.1 CONSTRUCTION COORDINATION WITH CITY OPERATIONS STAFF

3.1.1 The existing facilities, structures and systems operate 24 hours a day, 7 days per week. In the event of a conflict between construction operations and routine City operations, City operations have priority. Take every precaution to avoid interfering with routine operation and maintenance activities. Reschedule construction activities, if required, without change, to the contract price.

3.1.2 Coordinate activities on the site and in the existing buildings/ facilities/ structures with the City Representative.

3.1.3 Perform work continuously during critical shutdowns, connections and changeover, and as required to prevent interruption of City operations.

3.1.4 The Contractor must identify work activities that may impact the operation and maintenance activities of the City operations staff, in advance of the scheduled work, at least 5 business days prior to the work. The Contractor shall submit to the City Representative a detailed work plan listing work activities for the next 14 calendar days, detailing the works that will affect City operations staff.

3.1.5 Do not close lines, open or close valves, or take other action which would affect the operation of the existing systems, except as specifically required by the Contract Documents and only after the prior authorization of the City Representative has been obtained.

3.1.6 Coordinate the proposed work with the City Representative prior to process shutdowns. Under no circumstances stop the work at the end of a normal working day if such action may cause a cessation of any facility or structure operating process. In such cases, remain on site until the necessary work is complete.

3.1.7 Coordinate activities on the site and in the existing buildings/ facilities with the City Representative.

3.1.8 Perform work continuously during critical shutdown, connection and changeover, and as required to prevent interruption of the facility operation or City services.

3.1.9 Shutdown of existing facilities/ structures and tie-ins:

.1 When the Contractor requires a part of an existing facility, structure or process system shutdown for execution of construction activities, a formal shutdown request must be made in writing at least 14 calendar days in advance of the requested shutdown date. The shutdown request shall describe in detail the proposed method, and the procedures proposed to accomplish each portion of the Work that requires an interruption to the operation of the existing facility, structure or system. The Contractor shall not begin any such Work until it has received written acceptance of the methodology and approach from the City Representative. The Contractor shall include in its plan the specific number of work hours to complete each facility interruption, along with measures to mitigate risk to the City.

.2 The Contractor participating in the planning and execution of the shutdown shall coordinate with the City staff on the planning of the shutdown activity. The Contractor and City staff shall work together to establish a shutdown specific energy and equipment lockout strategy that is required for each shutdown of existing facilities, structures, and systems for all work that includes the Contractor's work to connect new systems to the existing facilities and structures. The operator is not obliged to provide the shutdown within the 14-day period if the effectiveness of the plant operations could be compromised. The operator will not unreasonably delay or refuse to make the plant processes or systems available for the Contractor's construction activities. A delay or refusal shall be based on the operator's opinion that the performance of the plant will be compromised.

.3 At each location where tie-in is required, the Contractor shall provide a complete system of temporary works including bulkheads, pumps, power, equipment, and labour as necessary to maintain facility/ structure/ system operations, and to allow for construction of the new structures/ systems.

.4 All temporary equipment, tools, materials, labour, and miscellaneous equipment must be scheduled and available at the Site in advance of any shutdowns. The Owner will not be responsible for delays or claims as a result of the Contractors lack of coordination.

.5 The City reserves the right to cancel any scheduled shutdown if system or weather conditions dictate, at no additional cost to the City.

.6 Prior to making major tie-ins to existing process units and structures, demonstrate that the equipment installed in all new structures is fully functional. Connections to existing works will not be permitted until all equipment in the new adjacent works operates to the satisfaction of the City Representative. No claim for delay will be entertained due to unsatisfactory operation of any equipment.

.7 Operations provided by City staff:

.i Access to City facilities and structures.

.ii Opening and closing of existing valves and gates in existing buildings, structures, or systems.

.iii Isolation of existing process piping.

.8 In the event any existing facility or structure is damaged, changes mode of operation or there is a risk of actual process upset due to the Contractor's work activity, the Contractor shall stop work immediately, contact the City Operations representative, report the incident to the City Representative, and make the Contractor's on-site resources available at the request and direction of the City Operations Representative at no extra cost to the project to mitigate any damage.

.9 Contractor shall supply and maintain all appropriate and necessary equipment for confined space entry operations in accordance with applicable regulations.

.10 The Contractor shall coordinate confined space entry operations where multiple parties are involved in accordance with the Nunavut Safety Act and Occupational Health and Safety Regulations.

3.2 COORDINATION OF TRADES AND SUBCONTRACTORS

3.2.1 The Contractor shall ensure cooperation with and between the trades and Subcontractors to ensure that the Work is carried out expeditiously and in a satisfactory manner. The Contractor shall be responsible for all extra costs arising from failure to properly coordinate the Work with the work of others

3.2.2 Coordinate civil, structural, architectural, mechanical, electrical, and instrumentation and work for the equipment and systems being constructed. Plan and coordinate the work in a timely manner so that the work proceeds expeditiously.

3.2.3 Extras will not be considered, based on differences of interpretation of the terms of references, as to which trade shall supply and install certain items or materials. Such coordination is entirely the responsibility of the Contractor.

3.3 COOPERATION WITH OTHER CONTRACTORS

3.3.1 Other contracts may be awarded to construct adjacent work to which this contract work connects.

3.3.2 At the interference with other contracts, jointly plan and coordinate with other contractors the work so that the project:

.1 Will not be delayed.

.2 Will not be endangered in any way.

.3 Will be correctly connected.

.4 Will not cause the City to be designated as the “Prime Contractor” as set out in the Safety Act.

3.3.3 Where any equipment is supplied by the Owner, coordinate unloading, transfer, installation, testing and placing into operation.

3.3.4 Where other work is in progress within or adjacent to the limits of this Contract, cooperate and coordinate with other Contractor(s), Utility Companies and the City of Iqaluit, and allow reasonable, free access to their work at all times.

3.3.5 Cooperate and make suitable working arrangements with other Contractor(s).

3.3.6 Notify the City Representative in advance and obtain approval in writing from the City Representative for all arrangements made with other Contractor(s).

3.4 UTILITY NOTIFICATION AND COORDINATION

3.4.1 Coordinate the Work with various utilities within Project limits. The Contractor shall notify applicable utilities prior to commencing the Work. The Contractor shall also notify the applicable utilities if any damage occurs, or if conflicts or emergencies arise during the execution of the Work.

3.4.2 Should any piping, sewers, cables or similar services be encountered during performance of the work that are not known from the City or other utility company's records, the Contractor shall notify the City Representative and the appropriate utility agency and shall not proceed with their removal or cutting until direction has been provided.

3.5 WORKING WITIN THE A CITY EASEMENT AND/OR RIGHT-OF-WAY

3.5.1 For construction work that will be taking place within a City easement and/or right-of-way, the Contractor must submit to the City Representative a completed City of Iqaluit Utility Permit application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

3.5.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures that will be used, the equipment that will be used.

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work.

.3 Traffic control plan (if applicable).

3.5.3 Utility permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

3.5.4 No work can proceed until approval has been provided in writing by the City Representative.

3.5.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

3.5.6 Pay relevant permit fees and charges.

3.6 PARTIAL OR FULL CLOSURE OF A MUNICIPAL ROADWAY

3.6.1 For construction work that will require a partial or full closure of a municipal roadway, the Contractor must submit to the City Representative a completed City of Iqaluit Road Closure Permit Application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

3.6.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures that will be used, the equipment that will be used.

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work.

.3 Traffic control plan. Refer to Section 5 Special Project Procedures regarding traffic control plan requirements.

3.6.3 Road closure permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

3.6.4 No work can proceed until approval has been provided in writing by the City Representative.

3.6.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

3.6.6 Pay relevant permit fees and charges.

3.7 WATER AND SEWER CONNECTIONS/ DISCONNECTIONS

3.7.1 For tie-in to City water and/or sewer infrastructure, the Contractor must submit to the City Representative a completed City of Iqaluit Water & Sewer Connection/ Disconnection Permit Application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

3.7.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures that will be used, the equipment that will be used

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work, along with dates/ times when City operations support is required to shutdown/ isolation of City systems.

.3 Traffic control plan (if applicable). Refer to Section 5 Special Project Procedures regarding traffic control plan requirements.

.4 By-pass plan (if applicable). Refer to Section 5 Special Project Procedures regarding by-pass plan requirements.

3.7.3 Utility permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

3.7.4 No work can proceed until approval has been provided in writing by the City Representative.

3.7.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

3.7.6 Pay relevant permit fees and charges.

3.8 WORKING IN EXISTING BUILDINGS

3.8.1 Obtain permission in writing from the City Representative prior to commencing work within an existing City building and/or facility, at least 7 business day prior to the start of work. The Contractor is to notify the City Representative what work will be taking place within the existing building, along with the measures that will be taken in order to ensure separation of work from City operations. Refer to Section 5 Special Project Procedures work permits.

3.8.2 The Contractor shall be responsible for enforcement of fire protection methods and procedures and adherence to local fire regulations, including any applicable requirements of the Safety Act and Occupational Health and Safety Regulations during the execution of the Work.

3.8.3 The Contractor shall ensure that existing fire protection and alarm systems are not obstructed, shut-off or made inactive at any time for the duration of the Contract. The Contractor shall not use any fire hydrant, standpipe or hose system for other than fire protection purposes.

END OF SECTION

4. REGULATORY REQUIREMENTS

4.1 SUBMITTALS

4.1.1 Quality Control Submittals: Submit certificates from inspecting authorities for electrical work and pressure piping, etc.

4.2 APPLICABLE CODES

4.2.1 Comply with the latest edition of the following statues and codes and all amendments thereto:

.1 The Nunavut Building Code Act and Regulations.

.2 National Building Code of Canada.

.3 Safety Act and Occupational Health and Safety Regulations.

.4 Nunavut Boilers and Pressure Vessel Act and Regulations.

.5 Canadian Electrical Code.

.6 Nunavut Electrical Protection Act.

.7 Nunavut Gas Protection Act.

.8 Codes and Standards of the National Fire Protection Association (NFPA).

.9 Nunavut Environmental Protection Act.

.10 Nunavut Waters and Nunavut Surface Rights Tribunal Act.

.11 City of Iqaluit Municipal Design Guidelines.

.12 City of Iqaluit By-Laws:

a. By-Law No. 200 Water & Sewer Services.

b. By-Law No. 137 Highway Obstructions.

c. By-Law No. 138 Highway Occupancy.

d. By-Law No. 319 Highway Traffic.

4.2.2 The Contractor shall conform to and enforce strict compliance with the Safety Act and Occupational Health and Safety Regulations. For purposes of the Safety Act and Occupational Health and Safety Regulations, the Contractor will be designated the “Prime Contractor” and assumes the responsibilities of the “Prime Contractor” as set out in the Act and its regulations.

4.3 PERMITS, APPROVALS, AND LICENCES

4.3.1 Apply for, obtain, and pay for all permits, approvals, and licenses required for the project, including but not limited to:

.1 Canadian Standards Association (CSA).

.2 Field certification of equipment.

.3 Electrical supply and inspection authorities including Government of Nunavut Electrical Safety authority. Contractor shall apply for permit, and review of installations.

.4 City of Iqaluit utility permits.

.5 City of Iqaluit road closure permits.

.6 City of Iqaluit water and sewer service connection/ disconnection permits.

.7 Government of Nunavut Building permits.

.8 Government of Nunavut Boiler and Pressure Vessel permits.

.9 Government of Nunavut Gas and Liquified Petroleum Gas permits.

.10 Other permits required for the work from governing federal, territorial and municipal authorities having jurisdiction.

4.3.2 Arrange for regular inspections and a final inspection with:

.1 The territorial electrical safety inspector.

.2 The territorial building inspector.

4.3.3 Arrange for all other regular inspections and final inspections.

4.3.4 The Contractor shall be solely responsible, without limitations, for any delays arising from the Contractor's failure to plan for the required inspections and to ascertain the availability of the Permit/Approval/Licensing Inspectors to complete the required inspections for the Works under this Contract. The related costs and expenses incurred by the Contractor shall be borne by the Contractor, with no change in the Contract Price and/or Contract Time.

END OF SECTION

5. SPECIAL PROJECT PROCEDURES

5.1 UTILITIES

5.1.1 The Contractor's attention is drawn to the presence of utilities on and around this site. The locations of utilities as shown on the Contract Drawings are approximate only and are not guaranteed. The Contractor shall be responsible for obtaining a stake-out of the utility from the company involved. The Contractor shall co-ordinate his work with the Utility Company and the Owner of concerned, should there be any bracing, removal or relocation of the pole lines or underground utility required. There will be no additional payment to the Contractor for any delays due to the relocation of utilities.

5.2 LIMITS OF CONSTRUCTION

5.2.1 The Contractor shall note that all work is to be contained within the limits of construction as noted in the Contract Documents. Trespassing outside these limits is not allowed. These requirements will be strictly enforced.

5.2.2 The Contractor shall coordinate the use of premises for staging, construction, storage and access area under the direction of the City Representative.

5.3 WORK PERMITS

5.3.1 When working in existing City facilities, buildings, and structures, the Contractor is to abide by the Owner's Location Work Permit. Contractor's site representatives will be expected to attend an initial meeting to complete this Permit together with the Owner at minimum every 7 business days in advance or with every change in location or nature of the work, to review safe work procedures as it relates to work within the existing facility. No work will be allowed to take place in existing facilities until the Location Work Permit procedure is utilized.

5.3.2 Provide a detailed work plan and schedule outlining all proposed tasks and timing for the related work. Meet with the City Representative and Owner as may be required to clarify and coordinate activities and timing. The City will review the request and return with comments if any.

5.4 TRAFFIC CONTROL

5.4.1 The Contractor shall develop a site-specific Traffic Control Plan (TCP) as per the site condition and submit to the City Representative for review and approval. TCP must be submitted 7 business days prior to start of construction work.

5.4.2 Contractor shall follow all standard traffic control procedures in accordance with the requirements of the Safety Act and Occupational Health and Safety Regulations.

5.4.3 Comply with requirements relevant to City of Iqaluit By-Laws with respect to road obstructions and occupancy.

5.4.4 When working on travelled ways:

.1 Place equipment in position which presents minimum interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

5.4.5 Do not close any lanes or roads without approval of City Representative via a Road Closure permit. Before re-routing traffic erect suitable signs and devices approved by City Representative.

5.4.6 Keep travelled ways graded, free of pot-holes and of sufficient width for required number of lanes of traffic.

5.4.7 Keep travelled ways free of snow:

.1 Pile snow in designated location(s).

.2 Do not pile snow on construction site or on adjacent property.

5.4.8 As indicated, provide graveled detours or temporary roads to facilitate passage of traffic around restricted construction area:

5.4.9 Do grading for detour in accordance with City Representative's written approval.

5.4.10 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of City Representative.

5.4.11 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

5.4.12 Supply and erect signs, delineators, barricades (concrete jersey barriers) and miscellaneous warning devices, as well as flagpersons, as required by the City of Iqaluit.

5.4.13 Place signs and other devices in locations approved by City Representative.

5.4.14 Meet with City Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of City Representative.

5.4.15 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

5.4.16 Provide competent and properly equipped flagpersons as Directed by City Representative.

.1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, and traffic signal system is not in use.

.3 When workmen or equipment are employed on travelled way over brow of hills, high snowbanks, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.7 At each end of restricted sections as directed by City Representative.

.8 Delays to public traffic due to contractor's operators: maximum 15 minutes.

.9 At the discretion of the City, if the City is of the opinion that flag persons are required to maintain site safety.

5.4.17 Where roadway, carrying two-way traffic, is restricted to one lane, for 24 hours each day, provide portable traffic signal system. Adjust, as necessary, and regularly maintain system during period of restriction. Signal system to meet requirements of Part IV of Manual of Uniform Traffic Control Devices for Streets and Highways.

5.4.18 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by City Representative to protect and control public traffic.

5.4.19 Maintain existing conditions for traffic crossing right-of-way.

.1 Maintain existing conditions for traffic crossing right-of-way except when required for construction.

.2 Delays to public traffic: maximum 15 minutes.

5.5 WORK IN HAZARDOUS AREAS

5.5.1 Before commencing the day's work and while working in areas that may contain an explosive, toxic or oxygen deficient atmosphere, test for explosive, toxic gases, and oxygen deficiencies. If a hazardous condition is found, make the work area safe before commencing or continuing work.

.1 Provide and maintain a suitable detection meter. Use this meter continuously. Calibrate the meter to sound an alarm at a preset warning level.

.2 Recalibrate the meter at times recommended by the manufacturer.

5.5.2 Smoking is not permitted in the hazardous areas and other areas designated by the City. The Contractor shall post "No Smoking" signs as required.

5.5.3 Use non-sparking tools in areas where an explosive atmosphere may exist.

5.5.4 Perform work in hazardous locations in accordance with the requirements of the Safety Act and Occupational Health and Safety Regulations.

5.5.5 It is the Contractor's responsibility (as Prime Contractor) to establish the classification of the work areas for the purpose of this contract.

5.5.6 Work Procedures for Hazardous Locations:

.1 Contractor is a Prime Contractor on this project and is responsible for site safety and adhering to all applicable laws and regulations applicable to the work procedures and/or locations.

.2 Construction activities that occur in hazardous locations require continuous combustible gas monitoring by the Contractor when the potential for a hazardous atmosphere exists.

5.5.7 Metering for Toxic, Combustible Gas, H_2S and Oxygen Deficiency:

.1 Utilize a suitable portable gas detection meter to continuously monitor for toxic gases, combustible gases, hydrogen sulfide and oxygen deficiency in the surrounding atmosphere. Set meter to sound alarm at a preset warning level. The Contractor shall demonstrate to the City Representative that the meter has recently been calibrated by a certified technician and is adequately functional for the intended purpose.

5.5.8 Meter Operator:

.1 When the potential for a hazardous atmosphere exists have a competent worker operate and read the portable meter continuously while construction activities occur in the designated hazardous locations. This meter operator is not permitted to assist in the construction activity in any way. Locate meter operator in the immediate vicinity of construction activity. If work in two or more different hazardous locations is required at the same time, provide the additional meter operator and meter.

5.5.9 Logbook:

.1 Maintain a logbook with:

a. Date.

b. Name of meter operator.

c. Explosive gas and oxygen deficiency readings every ½ hour.

.2 Construction activity type:

a. Location of construction activity.

b. Submit logbook to the City Representative when construction is complete.

5.5.10 Firefighting Equipment:

.1 Provide and maintain suitable firefighting equipment when working in designated hazardous locations. Train personnel in the use of firefighting equipment.

5.6 WORK IN CONFINED SPACES

5.6.1 For the purposes of this Contract, the following areas in existing operating process areas are identified as confined space locations:

.1 Access vaults (AV's).

.2 Manholes (MH's).

.3 Tanks, vessels, and sumps.

5.6.2 All work and entry into the identified Confined Spaces is to be done in accordance with the Nunavut Safety Act, R.S.N.W.T. 1988,c.S-1 – 2016, and the Nunavut Occupational Health and Safety Regulations, R-003-2016 – 2016.

5.6.3 The Contractor is responsible for all duties to ensure the work performed in the confined spaces is carried out in accordance with the Nunavut Safety Act, R.S.N.W.T. 1988,c.S-1 – 2016, and the Nunavut Occupational Health and Safety Regulations, R-003-2016 – 2016. The Contractor is responsible for all actions to ensure the duties imposed on employers by the Nunavut Safety Act, R.S.N.W.T. 1988,c.S-1 – 2016, and the Nunavut Occupational Health and Safety Regulations, R-003-2016 – 2016 are performed to protect the health and safety of all workers working in the confined spaces.

5.6.4 For all confined space entries, involving workers from any employer, the Contractor is responsible for all coordination for work activities, confined space assessment, development of entry plans, permitting, supply of equipment for atmospheric testing and monitoring, ventilation, access and egress, entry, monitoring, control, rescue planning, and the initiation and implementation of rescue procedures in accordance with the Regulations.

5.6.5 The Contractor shall maintain all appropriate documentation required under the Regulation and provide daily copies to the City Representative.

5.6.6 The Contractor shall supply all required safety, monitoring, control and personal protective equipment required for confined space entry operation, including, but not limited to entry and rescue equipment, atmosphere monitors (see Section 5) and breathing apparatus/ respiratory protection.

5.6.7 The Contractor shall ensure that all workers entering or interacting with the identified confined spaces are appropriately trained and that proof of training is provided upon request.

5.7 STORAGE AND PROTECTION OF MATERIALS AND EQUIPMENT

5.7.1 Protect materials and equipment after unloading, from weather, dust, dirt and moisture, both before and after erection and placing. Observe manufacturer's written instructions for temporary storage.

5.7.2 Maintain equipment in good condition, as per manufacturer's instructions.

5.7.3 Provide manufacturer's written instructions for the storing of equipment during the construction period, well in advance of equipment delivery.

5.7.4 Store specialty items to ensure protection from damage to materials or finish.

5.7.5 Store materials subject to water absorption off the ground. Protect materials from other damage due to environmental conditions using waterproof covers.

5.7.6 As work proceeds and upon completion, promptly clean up and remove from site surplus materials resulting from foregoing work.

5.8 DISPOSAL OF MATERIAL OFF-SITE

5.8.1 Material designated to be removed from the site must be promptly removed.

5.8.2 Make necessary arrangements for environmentally safe transportation and ultimate disposal in compliance with all applicable Regulations and Guidelines at no cost to the City, unless noted otherwise.

5.8.3 Carry out additional chemical analysis of site materials suspected to be contaminated and determine applicable Regulations and Guidelines as may be required to determine the environmental quality of materials encountered and to determine suitable means for transportation and ultimate disposal. Notify the City Representative of concerns and provide copy of test results. Payment for haulage and disposal fees for contaminated excavated material will be considered Extra Work to this Contract as required.

5.8.4 Removal of all waste material to the City's Waste Management Facility's West 40 Landfill. The Contractor will be responsible for all costs associated with loading, transportation and haulage, and tipping fees from the project site to the landfill.

5.9 ENVIRONMENTAL CONSIDERATIONS DURING CONSTRUCTION

5.9.1 Equipment Fueling:

.1 Designate an area within the working limits, a minimum of 30 meters away from open water courses, to be used exclusively for fueling construction equipment.

.2 Submit for review a plan for the interception and rapid clean-up of fuel spills should they occur.

.3 Maintain the apparatus for cleaning up fuel spills on site.

5.9.2 Cleaning Equipment:

.1 Keep construction equipment clean so that no debris is deposited on the City roadways.

.2 Contain construction debris in a designated area within the working limits.

.3 Dispose of debris off-site.

5.9.3 Noise Control:

.1 Use only vehicles and equipment equipped with effective muffling devices. Provide noise barriers on stationary engines and compressors. Provide noise barriers on stationary engines and compressors.

.2 Comply with City of Iqaluit Noise By-Law.

.3 Consider noise attenuation measures in the approach and submissions for noise generating activities.

5.9.4 Dust Control:

.1 Use water, or other methods to control dust as directed by the City Representative. Do not use chemical means of dust control without prior written approval from the City Representative. The use of petroleum products will not be allowed at any time.

.2 Submit dust control plan detailing proposed methods to control dust on site for review and acceptance by the City Representative.

5.10 PROTECTION OF EXISTING STRUCTURES AND PROPERTY

5.10.1 The Contractor will be held fully responsible by the City for any damage to utilities, properties, buildings, homes, or structures adjacent to or in the general area of the work, through settlement of ground, vibration or shock resulting from any cause relating to the work carried out under this Contract. Make good and repair such damage at own expense.

5.10.2 Refer to Section 14 – Preservation and Protection.

5.11 EROSION AND SEDIMENT CONTROL

5.11.1 Prepare and implement a separate detailed erosion and sediment control plan for the duration of the work.

5.11.2 Correct all erosion control deficiencies noted by the City Representative. Maintain appropriate measures in place until the construction is fully completed.

5.11.3 Cooperate with the City Representative and the Owner for periodic inspections (during and after construction).

5.12 DAMANGE BY VEHICLES AND OTHER EQUIPMENT

5.12.1 If at any time, in the opinion of the City Representative, damage is being or is likely to be done to any road, highway, improvements or property therein, other than such portions as are part of the work, by the Contractor's vehicles or other equipment whether licensed or unlicensed, the Contractor shall, on the direction of the City Representative and at the Contractor's own expense, make changes in or substitutions for such vehicles or other equipment or shall alter loadings or shall in some manner remove the cause.

5.13 PROPERTY OWNER'S LETTER OF RELEASE

5.13.1 The Contractor will be required, when instructed by the City Representative, to provide a letter from the Owner and/or Owners of property adjacent to the work or on which the work was constructed, clearly stating that the reinstatement work carried out by the Contractor has been completed satisfactorily.

5.13.2 This letter of release will only be required where damage has been caused to private property or where work takes place on private property or easement.

5.14 UTILITY OWNER'S LETTER OF RELEASE

5.14.1 The Contractor will be required, when instructed by the City Representative, to provide a letter from the owners of utilities stating that all services damaged during construction of the work have been satisfactorily repaired.

5.15 INCLEMENT WEATHER

5.15.1 Make adequate protection and take all necessary precautions at times of inclement weather.

5.15.2 Inclement weather or extra work caused by such weather will not be accepted as reason for additional payment or an extension to the time of completion. The Contractor shall carry for inclement weather in the Project Schedule.

5.16 SNOW PLOWING

5.16.1 The Contractor shall be responsible for snow and ice removal in the designated construction area and related access roads for each group of primary clarifiers as well as Contractor's staging and storage area at its own cost.

5.16.2 Snow plowing shall be under the direction of the City Representative and shall not block any municipal roadways, easements, access roads or driveways for the general public or City operating staff to access.

5.16.3 Snow is to be disposed of at the designated snow disposal area, as directed by the City Representative.

END OF SECTION

6. CONSTRUCTION SEQUENCING

6.1 GENERAL

6.1.1 The Work is to be completed in the time stated in the Form of Tender. In this regard, the Contractor is responsible for scheduling the sequencing of work.

6.1.2 This Section includes mandatory construction sequencing constraints and a suggested general sequence of construction that will satisfy the mandatory constraints required in the execution of the Work.

6.1.3 The Contractor shall plan to perform the work activities in such a sequence that does not necessitate the removal from service any essential part or component of the existing works without first having a temporary facility to enable continuous normal operation of the existing water pollution control plant and process or has fully commissioned new facilities that are capable of operating in place of the part or component of the existing works that the Contractor must demolish and/or modify.

6.1.4 The Contractor's sequencing of work shall consider the submission of technical submittals and shop drawings for review and approval, prior to the commencement of work in the field.

6.1.5 The Contractor's schedule shall incorporate a logical sequence of construction activities, such that the work be completed in a manner that is safe, efficient, and interruption free as per the time stated in the Form of Tender.

6.2 COORDINATION

6.2.1 It is noted that the proposed works must be constructed so as not to interfere with or cause any un-scheduled interruption of operation of existing City process systems and services.

6.2.2 Coordinate the requirements of this Section with the other requirements of the Contract Documents.

6.2.3 Refer to Section 3 for other coordination requirements.

6.3 SERVICES PROVIDED BY THE CONTRACTOR

6.3.1 The Contractor shall coordinate the construction activities with the City Representative in advance as per Section 3.

6.3.2 The Contractor shall provide the required temporary construction, drainage, grading, sedimentation, and erosion control measures for the construction area.

6.3.3 The Contractor shall provide the necessary temporary power, pumping facilities, ventilation equipment, pipes, valves, fittings, diversions, temporary bulkheads, or any other equipment and systems, as required during construction.

6.4 SERVICES PROVIDED BY THE CITY

6.4.1 The City will undertake all necessary isolations and shut-downs of operating equipment and systems.

6.4.2 The City will provide access to existing City buildings, facilities, and structures.

6.5 SEQUENCE OF CONSTRUCTION

6.5.1 Prior to mobilization, the Contractor will be required to adhere to the following sequencing requirements:

.1 Submit technical submittals to the City Representative for review and approval. Technical submittals will consist of the following:

a. Contractor Site-Specific Health and Safety Plan and Health and Environmental Minimum Performance Standard (MPS) and associated MPS checklist.

b. Contractor trade certificates and training records.

c. Construction schedule.

d. Traffic Control Plan (if applicable).

e. Erosion and Sediment Control Plan (if applicable).

f. Quality Assurance and Quality Control Plan.

.2 Obtain confirmation from the City Representative that the technical submittals presented above have been approved.

6.5.2 The City Representative may choose to delay mobilization activities, at no additional cost or impact to the Project Schedule, should the specified technical submittals not be submitted and approved prior to the start of mobilization activities.

6.5.3 Prior to initiating construction activities in the field, the Contractor will be required to adhere to the following sequencing requirements:

.1 Submit relevant shop drawings to the City Representative for review and approval prior to commencing the installations in the field.

.2 Obtain confirmation from the City Representative that the shop drawing(s) have been approved.

.3 Commence relevant installations related to approved shop drawings in the field.

6.5.4 The City Representative may choose to reject the installations in the field, at no additional cost or impact to the Project Schedule, if the relevant shop drawings are not approved prior to installation in the field.

6.5.5 The City Representative will be provided with five (5) business days to review relevant technical submittals and shop drawings. The City assumes only one (1) round of reviews for technical submittals and shop drawings. The Contractor will not be granted an extension of time or a change to the contract price, should the Contractor not address all review comments from the first submission, and require a subsequent review of a second or further resubmission(s).

6.5.6 Prior to backfilling an excavated trench where new civil installations or repairs have taken place, allow for the inspection of the works by the City Representative. Should the Contractor backfill the site, while failing to present the works and provide indication to the City Representative that the works are

ready for an inspection, the Contractor will be required to re-excavate the site in order to allow for an inspection of the works to take place at no change to the contract price and no extension to the contract schedule.

6.5.7 The Contractor's schedule shall carry for the implementation of the Inspection and Test Plan and required hold points identified in the Contract documents and any delays associated with not satisfying the requirements of the Inspection and Test Plan and/or the required hold points.

END OF SECTION

7. PAYMENT PROCEDURES

7.1 TERMS OF PAYMENT

7.1.1 Make applications for payment on account as provided in Agreement as Work progresses.

7.1.2 Applications for payment will be made monthly.

7.1.3 The date for Contractor's submission of monthly application for payment shall be on the last business day of the month.

7.1.4 The Contractor shall be reimbursed on a monthly basis in accordance with the instructions provided in the Bid Form.

7.1.5 For administrative purposes, the monthly application for payment shall be in the form of a progress payment and must indicate:

.1 Contract/ Project Title.

.2 City of Iqaluit Service Contract number.

.3 Progress payment number.

.4 Date progress payment issued.

.5 Period progress payment covers.

.6 The following shall be added to the Progress Claims:

<u>Breakdown of Work Performed to Date</u>

- Invoice number on breakdown matches the Invoice Number
- Period Ending Date on breakdown matches Period Ending Date on Invoice
- Percent complete on breakdown is appropriate given previous Invoice breakdown
- Values claimed on Invoice Breakdown are appropriate given observations in Consultant Site Report
- Cost elements where no draw was requested have been confirmed with Payment Certifier

<u>Breakdown of Cash Allowances</u>

- All reported cash allowances match the contract values plus any changes
- Previously approved release amounts match the Cost Tracking Log at Period Ending Date
- Value of work claimed for Cash Allowances is appropriate given Consultant Site Report
- Values add up correctly

<u>Breakdown of Project Change Notices</u>

- All approved changes are identified (even if not being drawn against)

- Sum of approved Changes matches sum on Cost Tracking Log for Period End Date
- Value of work on claimed on Changes is appropriate given Consultant Site Report
- Values add up correctly

Invoice

- Invoice Date is not before Period Ending Date
- Payment terms are as per the Contract
- PO# has been properly identified
- The Invoice Number is correct
- GST/PST/HST is properly identified
- Invoice Amount matches the sum of the Breakdown of work performed to date
- Period Ending Date is correct

Certificate for Payment

- Number on Certificate matches the Invoice Number
- Certificate Period Ending Date matches the Invoice Period Ending Date
- Date prepared is after Invoice Date
- Project name is correct
- Contract Amount is correct
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date
- Lien holdback percentage is correct
- Verify all calculations and Total Value of Work Performed to Date
- Payment Certifier has signed the CoP

Statutory Declaration (CCDC 9A – 2018)

- Statutory Declaration is provided with the Certificate for Payment
- “Application for payment number” and “date” for the last payment received match Consultant and Owner records – confirm discrepancies with Owner
- Date of the contract, owner name, contractor name exactly match the Contract
- Seal (CCDC 9A 2018) is original and attached
- Signature and date of declaration is complete
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date

WSIB / WCB Review (required after construction starts)

- The Expiry Date of XXXX is beyond the end of the next invoice period
- Certificate number is included
- Form is signed (if applicable)

7.1.6 The Contractor is to provide all relevant back-up material to validate the work that is being claimed in the monthly progress payment. This includes, but is not

limited to, daily timesheets for labour and equipment, material costs, back-up invoices, etc. For work completed on a time and materials basis where daily timesheets are produced, the Contractor must present timesheets to the City Representative at the end of each workday for review and approval.

7.1.7 The City shall reimburse Contractors for mark-ups from sub-contractors and/ or suppliers for parts, materials, and labour up to a maximum of 15%. Back-up invoices from sub-contractors and/ or suppliers/ vendors must be submitted as part of monthly application for payment. Monthly progress claims will be returned if back-up invoices are not provided.

7.1.8 No payment will be made for the cost of work incurred to remedy errors or omissions for which the Contractor is responsible.

7.1.9 Additional work that has been completed outside the scope of services identified in the contract, without written approval from the City Representative via the change order process, will not be paid. Contemplated changes must be presented to the City Representative for review. Should the contemplated change be endorsed, it will be presented to the City for approval via a change order. Once approved, the Contractor may proceed with the work in the field. Failure to comply with this requirement may result in no payment.

7.1.10 All progress payment claims are to be submitted to the City Representative; they are not to be submitted to the City's Finance Department.

7.1.11 The City will pay all invoices on a Net 30 basis, meaning payments will be made by the City within Thirty (30) calendar days of receipt and acceptance of the invoice, or the receipt and acceptance of the goods or services, whichever is later.

7.2 SCHEDULE OF VALUES

7.2.1 Make schedule of values out in such form and supported by such evidence as City Representative may reasonably direct and when accepted by City Representative, be used as basis for applications for payment.

7.2.2 Include statement based on schedule of values with each application for payment. Schedule of values to follow Terms of Reference sections outline.

7.2.3 Support claims for products delivered to Place of Work by not yet incorporated into Work by such evidence as City Representative may reasonably require establishing value and delivery of products.

7.3 APPLICATION FOR PAYMENT

7.3.1 Each month prepare a draft application for payment in the form of a progress payment claim for review and acceptance by the City Representative before submitting the monthly application for signature and payment.

7.3.2 Application for payment must show a schedule of values, for each item of approved breakdown of Contract Price established in the Contract, the following:

.1 Percentage and value of Work completed to date.

.2 Percentage and value of Work previously approved for payment.

.3 Percentage and value claimed this payment period.

.4 Percentage and value of Work remaining to be completed.

.5 Include separate line items for each approved Change Order executed, along with the information requested in 7.3.2.1, 7.3.2.2, 7.3.2.3, and 7.3.2.4.

7.3.3 Application for payment must include timesheets, back-up invoices from sub-contractors and/ or suppliers/ vendors, whichever applies. Where mark-ups apply per the Contract, ensure they are clearly shown.

7.3.4 Include an updated cash flow expenditure forecast with the application for payment.

7.3.5 Submit application for payment to the City Representative on the last business day of each month.

7.3.6 To assist the Contractor with preparation of application for payment, the City Representative is available to meet with the Contractor on an agreed date each month, on or prior to last day of month, to review progress of Work.

7.3.7 The Contractor and City Representative shall agree on quantity of Work performed and due for payment. Once quantity has been agreed upon, Contractor shall submit the final application for payment along with a corresponding invoice for the amount being claimed.

7.3.8 The following shall be included for the first application for payment:

.1 Approved monthly progress claim.

.2 Coinciding invoice.

.3 A copy of Workers Safety Compensation Board Certificate of Clearance.

.4 Updated construction schedule.

.5 Updated cash flow projection.

.6 The following shall be added to the Progress Claim:

<u>Breakdown of Work Performed to Date</u>

- Invoice number on breakdown matches the Invoice Number
- Period Ending Date on breakdown matches Period Ending Date on Invoice
- Percent complete on breakdown is appropriate given previous Invoice breakdown
- Values claimed on Invoice Breakdown are appropriate given observations in Consultant Site Report
- Cost elements where no draw was requested have been confirmed with Payment Certifier

<u>Breakdown of Cash Allowances</u>

- All reported cash allowances match the contract values plus any changes
- Previously approved release amounts match the Cost Tracking Log at Period Ending Date
- Value of work claimed for Cash Allowances is appropriate given Consultant Site Report
- Values add up correctly

Breakdown of Project Change Notices

- All approved changes are identified (even if not being drawn against)
- Sum of approved Changes matches sum on Cost Tracking Log for Period End Date
- Value of work on claimed on Changes is appropriate given Consultant Site Report
- Values add up correctly

Invoice

- Invoice Date is not before Period Ending Date
- Payment terms are as per the Contract
- PO# has been properly identified
- The Invoice Number is correct
- GST/PST/HST is properly identified
- Invoice Amount matches the sum of the Breakdown of work performed to date
- Period Ending Date is correct

Certificate for Payment

- Number on Certificate matches the Invoice Number
- Certificate Period Ending Date matches the Invoice Period Ending Date
- Date prepared is after Invoice Date
- Project name is correct
- Contract Amount is correct
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date
- Lien holdback percentage is correct
- Verify all calculations and Total Value of Work Performed to Date
- Payment Certifier has signed the CoP

WSIB / WCB Review (required after construction starts)

- The Expiry Date of XXXX is beyond the end of the next invoice period
- Certificate number is included
- Form is signed (if applicable)

7.3.9 The following shall be included for the second application for payment and onwards:

.1 Approved monthly progress claim.

.2 Coinciding invoice.

.3 A copy of Workers Safety Compensation Board Certificate of Clearance. For the Final Application/Substantial Completion the Contractor must have received a final Clearance Certificate of Clearance from WSCC.

.4 Statutory Declaration certifying that payment has actually been made in full to all subcontractors, suppliers, workmen, and others for labour, materials, and services required by Contract up to and including latest progress payment.

.5 Updated construction schedule.

.6 Updated cash flow projection.

.7 The following shall be added to the Progress Claims:

Breakdown of Work Performed to Date

- Invoice number on breakdown matches the Invoice Number
- Period Ending Date on breakdown matches Period Ending Date on Invoice
- Percent complete on breakdown is appropriate given previous Invoice breakdown
- Values claimed on Invoice Breakdown are appropriate given observations in Consultant Site Report
- Cost elements where no draw was requested have been confirmed with Payment Certifier

Breakdown of Cash Allowances

- All reported cash allowances match the contract values plus any changes
- Previously approved release amounts match the Cost Tracking Log at Period Ending Date
- Value of work claimed for Cash Allowances is appropriate given Consultant Site Report
- Values add up correctly

Breakdown of Project Change Notices

- All approved changes are identified (even if not being drawn against)
- Sum of approved Changes matches sum on Cost Tracking Log for Period End Date
- Value of work on claimed on Changes is appropriate given Consultant Site Report
- Values add up correctly

Invoice

- Invoice Date is not before Period Ending Date
- Payment terms are as per the Contract
- PO# has been properly identified
- The Invoice Number is correct

- GST/PST/HST is properly identified
- Invoice Amount matches the sum of the Breakdown of work performed to date
- Period Ending Date is correct

Certificate for Payment

- Number on Certificate matches the Invoice Number
- Certificate Period Ending Date matches the Invoice Period Ending Date
- Date prepared is after Invoice Date
- Project name is correct
- Contract Amount is correct
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date
- Lien holdback percentage is correct
- Verify all calculations and Total Value of Work Performed to Date
- Payment Certifier has signed the CoP

Statutory Declaration (CCDC 9A – 2018)

- Statutory Declaration is provided with the Certificate for Payment
- "Application for payment number" and "date" for the last payment received match Consultant and Owner records – confirm discrepancies with Owner
- Date of the contract, owner name, contractor name exactly match the Contract
- Seal (CCDC 9A 2018) is original and attached
- Signature and date of declaration is complete
- Approved Project Changes match Consultant Change Order Log as of the Period Ending Date

WSIB / WCB Review (required after construction starts)

- The Expiry Date of XXXX is beyond the end of the next invoice period. Note: for the Final Application, a final Clearance Certificate is required.
- Certificate number is included
- Form is signed (if applicable)

7.3.10 The City shall not release monies for Payment Certificates until the Contractor has provided all of the supporting documentation, as specified herein.

7.3.11 Deviations from the above specified requirements or incomplete submissions shall require resubmission of the application for payment.

7.4 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

7.4.1 Payment will not be made for the following:

.1 Loading, hauling, and disposing of rejected material.

.2 Quantities of material wasted or disposed of in a manner not called for under Contract Documents.

.3 Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.

.4 Material not unloaded from transporting vehicle.

.5 Defective Work not accepted by Owner.

.6 Material remaining on hand after completion of Work.

END OF SECTION

8. PROJECT MEETINGS

8.1 GENERAL

8.1.1 The City Representative will schedule the project meetings throughout progress of the Work.

8.1.2 The City Representative will prepare meeting agenda with regular participant input and distribute the written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within five (5) business days after each meeting to participants and parties affected by meeting decisions.

8.1.3 Representatives of Contractor, Subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.

8.2 PRECONSTRUCTION MEETING

8.2.1 After award of Contract, the City Representative will request a meeting of parties in contract to discuss and resolve administrative, health and safety procedures and responsibilities.

8.2.2 Preconstruction meeting will be held via teleconference. Teleconference instructions will be provided by the City Representative.

8.2.3 Preconstruction meeting agenda may include the following, as a minimum:

.1 Introductions.

.2 Project Initiation:

a. Service Contract Review.

b. Securities/ Bonds.

c. Insurance.

d. WSCC Certificate of Clearance.

.3 Safety:

a. Site Safety Requirements.

b. WSCC “New Operations & High Hazard Work” Notice.

c. Joint Health and Safety Committee or Occupational Health and Safety Representative.

d. Site Audits, Inspections and Incident Reporting.

e. Training, Qualifications and Trade Certificates.

.4 Project Execution Requirements:

a. Summary of Work.

b. Working Hours, Working Days

c. Construction Sequencing/ Coordination.

d. Contractor's Use of Premises.

e. Authorities Having Jurisdiction (GN/ Federal permits and inspections).

f. Special Project Procedures (Work Permits, Traffic Control, etc.).

g. Project Meetings.

h. Submittals and Shop Drawings.

i. Payment Procedures.

j. Change Orders.

k. Quality Control.

l. Closeout Requirements.

.5 Project Schedule:

a. Schedule Submission.

b. Key Milestone Dates.

c. Substantial Completion Submission Requirements.

d. Warranty (if applicable).

.6 Communication Structure: .

a. Stakeholder Representation

b. Communication Flow.

c. Communication of Changes in Scope, Schedule or Cost.

d. Site Communication Memos – RFI's, SI's, CCN's.

.7 Document Control.

.8 Other Business and Questions.

8.2.4 Attendees will include:

.1 Owner's representatives.

.2 City Representative.

.3 Contractor's project manager.

.4 Contractor's resident site superintendent.

.5 Contractor's quality control representative.

.6 Others as appropriate.

8.3 PROGRESS MEETINGS

8.3.1 City Representative will schedule regular progress meetings at site, conducted bi-weekly prior to mobilization and weekly during construction to review the Work progress, progress schedule, shop drawings and technical submittal schedule,

application for payment, contract modifications, and other matters needing discussion and resolution.

8.3.2 Progress meetings will be held via teleconference. Teleconference instructions will be provided by the City Representative.

8.3.3 Project progress review meeting agenda may include the following, as a minimum:

.1 Introductions:

a. Confirm Acceptance of Previous Meeting Minutes.

.2 Safety:

a. Safety Share.

b. Site Safety Audits, Inspections and Incident Reporting.

.3 Submittals and Shop Drawings:

a. Status of Technical Submittal Submissions/ Reviews.

b. Status of Shop Drawing Submissions/ Reviews.

.4 Site Communications:

a. Request for Information (RFI) – Status Update/ Outstanding Items.

b. Site Instructions (SI) – Status Update/ Outstanding Items.

c. Contemplated Change Notices (CCN) – Status Update/ Outstanding Items.

.5 Financial:

a. Progress Claims – Status Update/ Outstanding Items.

b. Change Orders – Status Update/ Outstanding Items.

c. Service Contract Financial Review.

.6 Work Progress:

a. Work Completed (Since Last Meeting).

b. Work Planned (Three-Week Look-ahead/ Schedule) Review.

c. Issues/ Concerns/ Risks and Mitigation Measures.

d. City/ Engineer Coordination Requirements.

.7 Quality Control:

a. Contractor Activities.

b. Status of Permitting and Inspections.

.8 Other Business and Questions.

8.3.4 Attendees will include:

.1 Owner's representative.

.2 City representative.

.3 Contractor's project manager.

.4 Contractor's site superintendent.

.5 Others as appropriate.

8.4 OTHER MEETINGS

8.4.1 In accordance with Contract Documents and as may be required by the Owner and/or City Representative.

8.4.2 Brief meetings attended by the Contractor's key personnel, the City Representative and as required, the Owner's representative, may be coordinated in order to help assist with other project related discussions such as isolation requirements, critical path tasks, schedule, quality, commissioning, claims, deficiencies, etc. in order to help with the progress of the work. The Contractor is to accommodate other meetings at no additional cost to the contract.

8.4.3 Meetings will be held via teleconference. Teleconference instructions will be provided by the City Representative.

END OF SECTION

9. CONSTRUCTION PROGRESS SCHEDULE

9.1 CONTRACTOR'S RESPONSIBILITIES

9.1.1 Prepare and submit to the City Representative a Construction Progress Schedule including a comprehensive work breakdown schedule complete with sequencing or implementation of each work tasks and work packages within five (5) business days of award of Contract. The schedule must reflect working days/ hours as per the contract. The schedule must show the following as a minimum:

.1 Mobilization and other preliminary activities such as installation of site fencing, trailer, signage, traffic control measures, etc.

.2 Submission of shop drawings, technical submittals, product data, material lists and samples.

.3 Delivery of any critical equipment and/or materials that will be key to the Works.

.4 Submission of key requests to the City such as isolation requests and City permit applications.

.5 Isolation and/or shutdown of City processes or systems by City Operations personnel, implementation of temporary by-pass systems, etc.

.6 Commencement and completion of work of each section of the terms of reference for each of the contract components as required by, and described in, the plans and terms and reference.

.7 Critical hold points which require the inspection and/or witness of the works by the City Representative, as described in the contract documents.

.8 Testing activities, commissioning, start-up and operating of the new equipment and/or systems.

.9 Substantial performance and final completion dates within time period required by the Contract Documents.

.10 Demobilization

9.1.2 Schedule shall represent a practical plan to complete the work within the Contract period and shall convey the plan to execute the work. Schedules as developed shall show the sequence and interdependencies of activities required for complete performance of the work.

9.1.3 Use extra forces and equipment, or revise method of operation when progress of work is not sufficient to meet Project Schedule.

9.1.4 Reviews of work progress based on Construction Schedule, will be conducted by the City Representative and schedule updated by Contractor in conjunction with and subject to approval of the City Representative.

9.1.5 Construction schedule shall be updated monthly with the payment schedule for the duration of the Contract.

9.1.6 Failure to include any element of work required for performance of the Contract or failure to properly sequence the work shall not excuse the Contractor from completing all work within the Contract Time.

9.1.7 All schedule submittals, excluding monthly progress reports, are subject to approval by the City Representative. The City Representative retains the right to withhold appropriate monies (up to the full value of the current progress payment) from progress payments until the Contractor submits an acceptable construction progress schedule. Update schedule updates acceptable to the City Representative.

9.1.8 Certify in writing and have signed by major subcontractors that the construction progress schedule have been discussed in detail with all major subcontractors and major suppliers as it relates to their respective work and submit a copy of the certificate to the City Representative.

9.1.9 All schedules shall be developed utilizing industry standard “best practices” including, but not limited to:

.1 No open-ended activities.

.2 No use of constraints other than those defined in the Contract Documents without the prior approval of the City Representative.

.3 No negative leads or lags.

.4 No excessive leads or lags without prior justification and approval from the City Representative.

.5 For individual schedule construction activities, do not exceed 14 calendar days in duration without prior approval of the City Representative. Subdivide activities exceeding 14 calendar days in duration to an appropriate level.

.6 Sufficiently describe schedule activities to include what is to be accomplished in each work area. Express activity durations in whole days. Clearly define work that is to be performed by subcontractors.

.7 Create the schedule in conformance with the work-hours, constraints, and Activity Code Structure, set forth in these Contract Documents.

.8 Activity Code Structure

a. Each activity shall be identified with codes including as a minimum:

i. The party responsible for performing the work.

ii. Where work is to be subcontracted, the subcontractor to be responsible for performing the work.

9.2 CONSTRUCTION SEQUENCING

9.2.1 Contractor is instructed to perform this work without disrupting current operating facilities, structures, and/or City services when applicable.

9.2.2 Contractor to prepare schedule and duration of all anticipated by-passes or shutdown of any existing facility. Schedule to be reviewed by the Owner for

approval. Furthermore, the Contractor shall provide notice as described in Section 3 - Coordination to the Owner for each and every scheduled by-pass, tie-in to and shutdown of existing facilities, structures, processes, or systems. Required notice plus the Owner's approval are required for all non-scheduled by-passes, tie-in to and shutdowns.

9.2.3 Any and all un-scheduled shutdown is the responsibility of the Contractor. Thus, all or any additional labour, testing, material and equipment required by the Owner to correct or assist in coordination and correction of deficiencies as a result of an un-scheduled shut down is at the Contractor's costs.

9.3 MONTHLY CONSTRUCTION SCHEDULE UPDATE

9.3.1 Submit once per month, a monthly construction progress schedule update showing the progress of the work to date. The updated progress schedule must be submitted with the monthly progress payment application.

9.3.2 Include with the update an electronic back-up of the native schedule file.

9.3.3 Payment will not be made without an approved construction progress schedule, and monthly construction progress schedule update.

9.3.4 The monthly construction progress schedule update shall have a data date as of the last day of the corresponding month (i.e. for schedules submitted at the beginning of February the data date shall be January 31).

9.3.5 Incorporate actual progress, start dates, completion dates, and progress up to the data date in the schedule update. All changes and revision made in the monthly construction progress schedule update shall be addressed in the narrative accompanying the submittal.

9.3.6 Change Orders will be addressed in accordance with the General Conditions and incorporated into the Contract construction progress schedule as individual schedule activities.

9.3.7 Payment will not be made without current approved monthly construction progress schedule update.

9.3.8 Any changes made to the schedule shall also include changes to the cost loading/ expenditure forecast. All the remaining activities to be completed shall equate to the remaining cost of the Work. Any addition or deletions to activities to the schedule will require subsequent revisions to ensure that the schedule continues to correlate to the current Schedule of Values.

9.3.9 If, according to the current updated Contract construction progress schedule, the work is fourteen or more days behind the Contract completion date, or the schedule contains fourteen or more days of negative float, considering all granted time extensions, submit, prior to the next progress payment, a revised recovery schedule, showing a work plan to complete the work within the original schedule period. Include with the submittal a detailed narrative describing the means and methods proposed to achieve the work in the time period. The City Representative may withhold approximate progress payments until a revised

schedule, acceptable to the City Representative, is submitted by the Contractor at no additional expense to the Owner.

9.4 RE-BASELINE CONTRACT CONSTRUCTION PROGRESS SCHEDULE

9.4.1 If, in the opinion of and at the request of the City Representative, the work has significantly fallen behind and/or the nature or plan of the work has changed from that which was originally portrayed in the Contract construction progress schedule, a Re-Baselined construction progress schedule shall be submitted that portrays the plan to complete the remaining Contract Work.

9.4.2 The Re-Baselined construction progress Contract Schedule shall be cost-loaded and be the basis for all subsequent monthly construction progress schedule updates.

9.5 THREE-WEEK LOOK-AHEAD

9.5.1 Submit a Gantt chart format depicting the intended work activities for the upcoming three-week period plus one-week retrospective look on a weekly basis.

9.5.2 All activities in the Three-Week Look-Ahead Schedule must correlate to an activity in the current monthly construction progress schedule update either as a one-to-one match, or as a subset of activities whose cumulative duration correlate to an activity in the monthly construction progress schedule update.

9.5.3 Note and explain in writing all deviations, including but not limited to sequences of work, timing, and durations or activities, from the Contract construction progress schedule or monthly construction progress schedule updates. These deviations must be addressed in the following monthly construction progress schedule update.

9.5.4 Portray all activities clearly and legibly on the schedule and include logical activity numbers.

9.5.5 Submit the schedule at the bi-weekly construction progress meeting.

9.6 MONTHLY EXPENDITURE/ CASH FLOW FORECAST

9.6.1 Submit, on a monthly basis, an update to the monthly expenditure/ cash flow forecast. The cash flow forecast is to be submitted as part of the Contractors monthly progress payment application.

9.6.2 The Monthly Expenditure/ Cash Flow Forecast shall be presented in a manner that best illustrates how the Contractor intends to invoice, on a monthly basis, based on the Contractor understanding of the Work, methodologies to be used, and the Contract construction progress schedule.

9.7 REVIEW, UPDATE AND REVISIONS

9.7.1 Allow for the City Representative's review and comments according to the following schedule from the date of receipt:

.1 Draft Contract construction progress Schedule: 7 calendar days

.2 Contract construction progress Schedule: 7 calendar days

.3 Monthly construction progress schedule Updates: 7 calendar days

.4 Three-Week Look-Ahead Schedule: 7 calendar days

9.7.2 Make all corrections to the schedule requested by the City Representative and resubmit the schedule for approval if requested. If the Contractor does not agree with the City Representative's comments, provide written notice of disagreement within five (5) business days from the receipt of City Representative comments for the Preliminary 60-day, Contract Construction Progress Schedule, Monthly Construction Progress Schedule Updates, and Three-Week Look-ahead Schedules. City Representative's comments for which the Contractor disagrees shall be resolved in a meeting held for that purpose, if necessary.

9.8 REQUESTS FOR TIME EXTENSIONS

9.8.1 Be responsible for submitting a written request for all extensions of Contract Time in accordance with the General Conditions. Requests not submitted in writing, without the required documentation and not submitted in a time consistent with the General Conditions, will not be considered.

9.8.2 Include in the request documentation and written justification for the extension of time, supporting evidence and specific references to the schedule.

9.8.3 Also include with request an analysis of a calendar time-scaled Construction Progress Schedule and reports depicting the time impact basis of the request with the affected areas prominently highlighted. Use only the most current accepted schedule at the time the impact occurred when determining time extension request.

9.8.4 If the City Representative finds that the Contractor is entitled to an extension of time of any completion date under the provisions of the Contract, the City Representative's determination of the total number of days extension will be based upon the current analysis of the Contract Construction Progress Schedule and upon data relevant to the extension. Extensions of time for performance under all of the provisions of the Contract will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total float along the paths involved of the accepted and current Contract Construction Progress Schedule.

END OF SECTION

10. SUBMITTAL PROCEDURES

10.1 SUMMARY

10.1.1 This section defines the submittals to the Owner, or their designate, necessary before, during and after construction, which include as a minimum:

.1 Site-Specific Health and Safety Plan and the City of Iqaluit's Contractor Safety, Health and Environmental Minimum Performance Standard (MPS) and submittal of the associated MPS checklist.

.2 Construction Progress Schedule.

.3 Shop Drawings for permanent and temporary works.

.4 Product data and samples.

.5 QA/QC tests and reports.

.6 Concrete mix design.

.7 Erosion and Sediment Control Plan.

.8 Selective Demolition Plan and Schedule.

.9 Guaranties and Warranties.

.10 Traffic Control Plan.

.11 Temporary works plans (i.e. By-Pass Plan, Servicing Plan, Water Management Plan, Shoring/ Bracing Plan, Critical Lift Plan, etc.).

10.1.2 For submittals facsimile transmissions will not be acceptable.

10.1.3 Do not proceed with work until the City Representative reviews relevant submissions.

10.1.4 Refer to individual sections for other submission requirements.

10.2 ADMINISTRATIVE

10.2.1 Submit to the City Representative a list of all submittals and shop drawings for review within seven (7) calendar days of the Award of the Contract. Submit within reasonable promptness and in orderly sequence so as not to cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. Submit an updated list with the submission or response of each submittal or shop drawing.

10.2.2 Work affected by submittals shall not proceed until review is complete.

10.2.3 Present shop drawings, technical submittals, product data and reports in SI Metric units.

10.2.4 Present shop drawings, technical submittals, product data and reports in the English language.

10.2.5 Where items or information is not produced SI Metric units, converted values are acceptable.

10.2.6 Review submittals prior to submission to City Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

10.2.7 Notify the City Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

10.2.8 Verify that field measurements and affected adjacent work are coordinated.

10.2.9 Contractor's responsibility for errors and omissions in submission is not relieved by City Representative's review of submittals.

10.2.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the City Representative's review.

10.2.11 Keep one reviewed copy of each submission on site for reference during the construction.

10.2.12 Refer to other individual sections for specific requirements on shop drawings submission.

10.3 PROCEDURES

10.3.1 Direct all submittals to the City Representative.

10.3.2 Unless indicated otherwise, submit one (1) electronic copy of all submittals.

10.3.3 Electronic Submittals:

.1 Each electronic submittal shall be searchable in Adobe Acrobat Portable Document Format (PDF).

.2 Electronic submittal that contains more than 10 pages in PDF format shall contain internal book marking from an index page to major sections of the document.

.3 PDF files shall be set to open "Bookmarks and Page" view.

.4 Include a copy of the Transmittal of Contractor's Submittal form with each electronic submittal.

.5 Submit new electronic files for each resubmittal.

.6 Detailed procedures for handling electronic submittals will be discussed at the preconstruction meeting.

.7 Submittals without electronic copies will be rejected by the City Representative.

10.3.4 List of Submittals:

.1 Within seven (7) working days of Contract Award, submit a complete list of anticipated submittals and shop drawings, as per the requirements of the contract.

.2 For each section of the general requirements and terms of reference, the Contractor shall provide a table listing all the submittals anticipated for that section of the Contract. The table shall include the following information:

a. General Requirements or Terms of Reference Section.

b. Total number of submittals for this Section.

c. Shop drawings associated with each submittal.

d. Revision and status for each submittal.

10.3.5 Transmittal of Submittal:

.1 Accompany each submittal with a transmittal letter, containing:

a. Project title and number.

b. Date of submittal.

c. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.

d. Numbering and Tracking System:

i. Sequentially number each submittal.

ii. Resubmission of submittal shall have original number with sequential alphabetic suffix.

e. Name, tag No. and quantity of equipment/ system included in each submittal.

f. General Requirement and Terms of Reference Section and paragraph to which submittal applies.

g. Deviation or variation from Contract Documents.

h. Contractor's stamp, signature and statement to certify that the submittal has been reviewed, checked, and approved for compliance with Contract Documents.

i. Include the Contractor's written response to each of the City Representative's review comments with resubmission of submittals stamped "Revise and Resubmit".

j. Other pertinent data.

10.3.6 Processing Time:

.1 Time for review shall commence on City Representative's receipt of submittal.

.2 The City Representative will act upon the Contractor's submittal and transmit response to Contractor not later than five (5) working days after receipt, unless otherwise specified.

.3 Resubmittals will have same review time unless otherwise specified.

.4 No claims will be allowed that arise due to delays in re-submissions and review of shop drawings.

10.3.7 Resubmittals:

.1 Clearly identify each correction or change made and include revision date.

.2 Provide clear response to each itemized comment by the City Representative on the submittal, whether or not action has been taken, and description of action.

.3 No adjustment of Contract Times or Price will be allowed due to delays in progress of Work caused by rejection and subsequent resubmittals.

.4 The Contractor to note that the first two submission of each submittal (original submittal and subsequent resubmittal) will be reviewed at no charge to the Contractor. Any cost for processing/ reviewing submittals which have been reviewed three times or more will be deducted from the contract amount owed to the Contractor.

10.3.8 Incomplete Submittals:

.1 The City Representative will return entire submittal for the Contractor's revision if preliminary review deems it incomplete.

.2 When any of the following are missing, submittal will be deemed incomplete:

a. Transmittal of Contractor's submittal, completed and signed.

b. Insufficient number of copies.

c. All requested information is not provided.

d. Submittals missing Professional Engineer's seal and signature, where it is required.

END OF SECTION

11. HEALTH AND SAFETY REQUIREMENTS

11.1 REFERENCES

11.1.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

11.1.2 Nunavut Safety Act, R.S.N.W.T. 1988, c-S-1 most recently amended and in force June 19, 2016.

11.1.3 Nunavut Occupational Health and Safety Regulations, R-003-2016, most recently amended and in force June 19, 2016.

11.2 GENERAL REQUIREMENTS

11.2.1 The Contractor shall hold the responsibility of Prime Contractor, as described in the Nunavut Safety Act, and shall be solely responsible for construction safety, ensuring compliance with the Safety Act and Regulations.

11.2.2 Perform site specific safety hazardous assessment related to project.

11.2.3 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site.

11.2.4 The Contractor shall file a New Operations & High Hazard Work notice for the Works with the Workers' Safety and Compensation Commission (WSCC) prior to commencement of Work. Submit relevant documents to City Representative, providing indication that notice has been submitted. The Contractor will not be allowed to commence construction activities until notice has been filed and acknowledged by WSCC. Failure to submit a notice and provide record of such communication to the City Representative prior to the start of Works will not be considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. The New Operations & High Hazard Work notice must be posted at the construction site as per requirements of the Safety Act.

11.2.5 Meet or exceed the latest revision of all Local, Federal, Territorial laws, regulations, standards, and industry best practices relating to health and safety.

11.2.6 Be solely responsible for safety of the Work under this Contract and for complying with and ensuring that every person on the Site complies with the requirements contained within the Contract Documents and regulatory requirements.

11.2.7 Perform the Work, or ensure that it is performed, in a manner to avoid risk of injury, security or damage to persons or property, adjacent property, or environment.

11.2.8 Provide safe access, egress, and equipment in accordance with Occupational Health and Safety Regulations for entry into all areas by the employees, subcontractors, City, and Consultant. Where hazardous areas or confined space

entry exists, implement procedures defined by the latest revision of the applicable Occupational Health and Safety Regulations or the Electrical Code.

11.2.9 Prior to the commencement of the Work, review and become fully familiarized with all Local, Territorial, and Federal regulatory requirements and the following documentation:

.1 Nunavut's Safety Act and applicable regulations.

.2 Nunavut's Workers' Compensation Act and applicable regulations.

.3 Nunavut's Environmental Protection Act and application regulations.

.4 Canadian Electrical Code.

.5 Contract Documents.

11.2.10 The Contractor shall be solely responsible for construction safety for this Contract and for complying with and ensuring that every person on the Site complies with the measures and requirements contained in:

.1 Nunavut's Safety Act and applicable regulations.

.2 Nunavut's Workers' Compensation Act and applicable regulations.

.3 Nunavut's Environmental Protection Act and application regulations.

.4 Canadian Electrical Code.

.5 Contract Documents.

11.2.11 In event of a conflict between any provisions of the above authorities, the most stringent provision shall govern.

11.2.12 Provide and maintain first aid, hygiene, washrooms, potable water, and fire protection equipment at the Site in accordance with the applicable regulatory requirements. The Contractor shall designate trained employees to be in charge of first aid on the Site.

11.2.13 Establish, maintain, and mark clear routes, paths and points for routine and emergency exit to, from and within the Site for personnel and vehicles.

11.2.14 The Contractor shall erect signs relating to safety on the Site, and signs or notices required by the applicable territorial and local regulations or by the Contract Documents.

11.2.15 Erect signage acceptable to the City at all entry points to the Site to advise personnel entering the Site of the requirements respecting the use and wearing of personal protective equipment. And the Contractor shall ensure compliance with these requirements.

11.2.16 Erect signage acceptable to the City at all entry points to the Site to advise the employees, Subcontractors and other individuals entering the Site that:

.1 All personnel and employees on the Site are required to comply with safety policies, procedures and instructions of the Contractor.

.2 That any personnel failing to adhere to the safety policies, procedures and instructions of the Contractor may be removed from the Site and denied further access.

11.2.17 The Contractor shall post warning signs at hazardous areas or where hazardous materials are stored and install protective barriers. The Contractor shall instruct personnel of proper safety procedures.

11.2.18 The Contractor shall identify all areas which are considered to be hazardous locations and comply withal requirements of the Government of Nunavut Labour Standards Office.

11.2.19 Smoking is not permitted in hazardous areas or other areas as designated by the City. The Contractor shall post “No Smoking” signs as required.

11.2.20 The Contractor shall inspect the physical condition of the workplace at least weekly, or as often as required by territorial health and safety regulatory requirements, in order to ensure that the Work is performed safely and that the Site is maintained in accordance with the territorial regulatory requirements and the Contract Documents. The Contractor shall prepare and maintain a documented record of each inspection describing the scope of inspection and findings. Copies of all safety inspections shall be kept on Site and available for review by the City Representative.

11.2.21 Safety equipment such as gas detection equipment for explosive or toxic gases or oxygen deficiency, fall protection devises, etc., shall be made available by the Contractor to the City Representative for access to the site when required. The Contractor shall be responsible for the coordination of the multiple-party access to the hazardous and confined space on the Site.

11.2.22 Ensure adequate coordination and communication between all parties on site in regard to safety.

11.2.23 In addition to Occupation Health and Safety Act and applicable Regulations reporting requirements, report all incidents, near misses, spills, environmental damage, and property damage to the City Representative immediately within four (4) hours of the event. An incident investigation must be conducted, and a copy of the complete report provided to the City Representative within 24 hours.

11.2.24 Ensure that all employees and subcontractors are competent, as prescribed by the applicable legislation, in performing the Work and have been trained on the Contractor’s Site-Specific Health and Safety Plan and COVID-19 Mitigation Plan prior to starting Work on the Contract. The Contractor shall make available all training records for the City Representative’s review.

11.2.25 The Contractor shall ensure all workers that perform work be certified under the Trades and Qualifications and Apprenticeship Act for their specific work activity. No worker shall perform a type of work unless he/ she is certified to do so.

11.2.26 The Contractor shall appoint a competent person, as defined by the Safety Act, as a supervisor.

11.2.27 The Contractor shall appoint a Joint Health and Safety Committee or Occupational Health and Safety Representative, as defined by the Safety Act, for the project.

11.2.28 The supervisor shall supervise the work at all times either personally or by having an identified assistant do so personally. The assistant must comply with all the same requirements that the supervisor is held to.

11.2.29 The supervisor shall inspect the work site and equipment associated with the project at least once a week. A copy of the inspection report must be provided to the City Representative.

11.2.30 The Contractor shall remove waste material and debris from the work site(s) to a disposal area at least once a day or more frequently if necessary, to prevent the creation of a hazardous condition.

11.2.31 The Contractor shall ensure that a First Aid kit is provided and maintained on site at all times, in accordance with relevant health and safety regulations.

11.2.32 The Contractor shall ensure that fire-extinguishing equipment is provided and maintained on site at all times, in accordance with relevant health and safety regulations.

11.2.33 The Contractor shall ensure that all vehicles, machinery, tools and equipment used on the work site are operated and maintained in accordance with relevant health and safety regulations.

11.2.34 The Contractor will be required to conduct weekly safety audits, in order to ensure compliance to the Site-Specific Health and Safety Plan. Safety Audit reports are to be submitted to the City Representative on a weekly basis.

11.2.35 City Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

11.2.36 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Territory having jurisdiction, and in consultation with City Representative.

11.3 SUBMITTALS

11.3.1 Make submittals in accordance with Section 10 – Submittal Procedures.

11.3.2 The Contractor shall submit a Site-Specific Health and Safety Plan and the City of Iqaluit's Contractor Safety, Health and Environmental Minimum Performance Standard (MPS) and submittal of the associated MPS within seven (7) calendar days after the Award of the Contract, to address the requirements of the above referenced regulations and contract documents.

11.3.3 A Site-Specific Health and Safety Plan must be in place prior to the start of construction activities. If a Site-Specific Health and Safety Plan has not been submitted prior to the start of the Works, the City Representative may issue a stop work order, until one is presented which meets the requirements of the regulations and contract documents. Failure to submit a Site-Specific Health and

Safety Plan within the required timelines, which meets the requirements of the contract, will not be sufficient reason for an extension of Contract Time or additional compensation, and no claim for extension or additional costs by reason of such default will be allowed.

11.3.4 The Contractor shall provide a health and safety plan which as a minimum will include:

.1 A Site-Specific Health and Safety Management Plan, includes:

a. Introduction, roles and responsibilities for:

I. Site Supervisor

II. Project Manager

III. Site Safety Coordinator

IV. Site Workers

V. Occupational Health and Safety Representative

VI. Joint Health and Safety Committee

b. Contractor Project/ Contract Organizational Chart

c. Training and certification of workers.

d. Orientation for new works or visitors to site.

e. Project hazard assessment and safety procedures.

f. Safety meetings format and schedule.

g. Site safety audits, inspections, and incident reporting.

h. Workplace hazardous materials information.

i. Tagging and lock out procedures.

j. Confined space entry procedure.

k. Work on or near live apparatus.

l. Hot works procedures.

m. Posting of information.

n. Housekeeping.

.2 A Hazardous Identification Plan, includes primary environmental hazards, personal conduct and hygiene, potential hazards which include:

a. Survey work in traffic.

b. Physical.

c. Working at heights.

d. Fire and explosion.

e. Confined space entry.

f. Cranes, hoists, and rigging.

g. Crane suspended personnel platforms.

h. Biological.

i. Stress and fatigue.

j. Noise.

k. Cold Weather.

l. Wildlife

m. Personal security.

n. Adverse weather conditions.

o. Other site activities.

.3 A Personal Protective Equipment Inventory, which includes:

a. Requirements for all site personnel.

b. Selection, maintenance and continual assessment.

.4 An Emergency Preparedness and Response Plan, which addresses at a minimum, all materials, tools and equipment stocked on site, emergency contacts, and detailed execution plans, for the following:

a. First aid.

b. Fire protection.

c. Critical injury.

d. Accident or incident.

e. Other emergencies that may be encountered as part of the Work.

.5 A COVID-19 Mitigation Plan, which addresses:

a. Isolation and quarantine.

b. Social distancing.

c. Hand washing and hygiene.

d. Masks.

.6 The plan shall be reviewed by all works prior to the start of Work. The Contractor must obtain sign-off from all workers providing acknowledgement that the plan has been reviewed.

.7 The plan shall be posted in a visible location on the work site prior to the commencement of any work.

11.4 CHEMICALS

11.4.1 The Contractor must provide a list of all chemicals to be used on site and a copy of the Material Safety Data Sheet (MSDS) for each chemical to the City Representative prior to being brought onto the job site.

11.4.2 The Contractor must ensure each chemical container brought on site is clearly labelled with the identity of the chemical, information for the safe handling of the chemical and the location of the MSDS.

11.4.3 The Contractor must ensure adequate measures are taken to control the distribution, within the application area or throughout the building, of fumes/ vapours before applying flammable, noxious or volatile materials.

11.4.4 The Contractor may be required to schedule the application of hazardous materials which might affect the well-being of any workers or disrupt work of other contractors and cannot be adequately controlled to prevent such occurrences to evening or weekend periods.

11.4.5 The Contractor must ensure workers wear the required personal protective equipment (respiratory protection, protective clothing, hand protection, eye/face protection, etc.) when working with chemicals.

11.4.6 The Contractor must ensure the safe use and disposal of all chemicals that they are using. No chemicals and/or chemical waste product shall be disposed of on site without prior approval of City Representative.

11.4.7 The Contractor may not store chemicals and compressed gas cylinders on site without approval of the City Representative. If approved, the contractor must ensure incompatible chemicals are stored separately.

11.5 DESIGNATED SUBSTANCES / HAZARDOUS WASTE

11.5.1 The Contractor shall provide a work plan for the removal of designated substances, in accordance with all applicable legislation, for review and approval to the City Representative.

11.5.2 The Contractor shall provide evidence of competency with regards to the Environmental Protection Act and its regulations, a copy of safe handling work plan prior to commencing with work in the area.

11.5.3 The Contractor shall register the project as a waste generator site, if not already registered, for the waste that will be generated as a result of the work activities related to the project.

11.5.4 The Contractor shall ensure and provide evidence that all hazardous wastes removed from the sites is sent to a licensed waste disposal site by a licensed carrier and advise the responsible individual when necessary testing is to be carried out.

11.5.5 The Contractor shall retain copies of all hazardous waste manifests on file.

11.5.6 The Contractor shall inspect the project daily to monitor compliance with designated substances and hazardous waste regulations.

11.5.7 The Contractor shall provide access to the responsible individual for review of all inspection reports.

11.6 FALL PROTECTION

11.6.1 The Contractor shall comply with the requirements of Sections 57 to 59 of R.R.N.W.T. 1990, c.S-1.

11.6.2 The Contractor shall provide, upon request, proof of worker training in the use of their fall protection systems.

11.6.3 The Contractor shall be responsible for supplying and maintaining all equipment needed to perform this role.

11.7 CONFINED SPACE ENTRY

11.7.1 The Contractor shall comply with the requirements of Section 36 to 37 of R.R.N.W.T. 1990, c.S-1.

11.7.2 The Contractor shall comply with the requirements of the City's Confined Space Entry program.

11.8 LADDERS

11.8.1 The Contractor shall comply with the requirements of Sections 246 to 259 of R.R.N.W.T. 1990, c.S-1.

11.8.2 The Contractor shall be responsible for supplying and maintaining all equipment needed to perform this role.

11.9 WELDING/ CUTTING

11.9.1 The Contractor shall comply with the requirements of Sections 154 to 167 of R.R.N.W.T. 1990, c.S-1.

11.9.2 The Contractor shall be responsible for supplying and maintaining all equipment needed to perform this role.

11.10 SCAFFOLDING

11.10.1 The Contractor shall comply with the requirements of Sections 260 to 327 of R.R.N.W.T. 1990, c.S-1.

11.10.2 The Contractor shall design, erect, inspect, maintain and use scaffolding equipment materials, and components in accordance with CAN/CSA-S269.2-M87 (Access Scaffolding for Construction Purposes).

11.10.3 The Contractor shall be responsible for supply and maintenance of all equipment needed to perform this role.

11.11 MOBILE EQUIPMENT

11.11.1 The Contractor shall comply with the requirements of Sections 200 to 242 of R.R.N.W.T. 1990, c.S-1.

11.11.2 The Contractor shall be responsible for supplying and maintaining all equipment needed to perform this role.

11.12 CONSTRUCTION TOWERS AND HOISTS

11.12.1 The Contractor shall comply with the requirements of Sections 433 to 464 of R.R.N.W.T. 1990, c.S-1.

11.12.2 The Contractor shall provide, upon request, proof of worker training in the safe operation of the crane or similar hoisting device.

11.12.3 The Contractor shall make available all logbooks, inspection records and tests for cranes of similar hoisting devices, upon request.

11.12.4 The Contractor shall be responsible for supplying and maintaining all equipment needed to perform this role.

11.13 EXCAVATING AND TRENCHING

11.13.1 The Contractor shall ensure no person enters an excavation unless another worker is working above ground close to the excavation or to the means of access to it.

11.13.2 The Contractor shall arrange for the locating of buried services prior to commencing an excavation.

11.13.3 The Contractor shall comply with the requirements of Sections 396 to 432 of R.R.N.W.T. 1990, c.S-1.

11.14 UNFORESEEN HAZARDS

11.14.1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Territory having jurisdiction. Advise City Representative verbally and in writing.

11.15 CORRECTION OF NON-COMPLIANCE

11.15.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by City Representative.

11.15.2 Provide City Representative with written report of action taken to correct non-compliance of health and safety issues identified.

11.15.3 City Representative may stop Work if non-compliance of health and safety regulations is not corrected. Delays due to a stop-work caused by non-compliance of health and safety regulations will not be considered sufficient reason for an extension of Contract Time and/or Price, and no claim for extension by reason of such default will be allowed.

11.16 CITY OF IQALUIT CONTRACTOR SAFETY, HEALTH & ENVIRONMENTAL MINIMUM PERFORMANCE STANDARD (MPS)

11.16.1 The City of Iqaluit's Contractor Safety, Health and Environmental Minimum Performance Standard (MPS) and associated submittal requirements is provided by the City of Iqaluit and attached as a separate document.

END OF SECTION

12. QUALITY CONTROL

12.1 CONTRACTOR'S RESPONSIBILITY

12.1.1 The Contractor is to implement their own field quality control system that will include, but is not limited to, the following activities:

.1 Shop drawings, technical submittals, product data and sample reviews.

.2 Compaction of backfill and granular base courses.

.3 Concrete testing, aggregate testing and cement testing for both cast-in-place concrete, and precast concrete items.

.4 Concrete mix design.

.5 Welding of structural steel and pipe joints.

.6 Pressure testing of pipes.

.7 Torque of high-strength bolts.

.8 Load tests of structural items.

.9 Subgrade examination for load bearing capability if required.

.10 Instrumentation calibration and testing.

.11 Performance testing of equipment.

12.1.2 The Contractor is responsible to coordinate and execute the necessary quality control systems, as per the instructions stipulated in the contract documents, in order to validate that the work meets the requirements of the contract documents.

12.1.3 The Contractor is responsible for providing results obtained from the inspection of testing of works as per the relevant field quality control systems, in order to validate compliance with the instructions provided in the contract documents.

12.1.4 Failure to submit relevant inspection and testing results to validate work conformance to the contract documents may render the work non-conforming and may require the Contractor to reperform the work. Delays and additional costs due to rework and re-performance of tests will not be considered sufficient reason for an extension of Contract Time and/or Price, and no claim for extension by reason of such default will be allowed.

12.2 SUBMITTALS

12.2.1 Make submittals in accordance with Section 10 – Submittal Procedures.

12.2.2 The Contractor shall submit a Quality Assurance & Quality Control Plan within ten (10) business days after the Award of the Contract.

12.2.3 A Quality Assurance & Quality Control Plan must be in place prior to the start of construction activities in order to ensure that necessary quality control systems are in place for the works. The Quality Assurance & Quality Control Plan must be reviewed by all Contractor workers in the field.

12.2.4 The Quality Assurance & Quality Control Plan Inspection must include the following sections at a minimum:

.1 Introduction and project description.

.2 Contractor key personnel

.3 Roles and responsibilities of Contractor, City Representative, and Owner.

.4 Submittals (shop drawings, technical submittals, product data, etc.).

a. Submittal schedule.

b. Process, review and acceptance.

.5 Quality control systems.

.6 Inspection and verification requirements.

.7 Acceptance criteria.

.8 Sample inspection and test forms.

.9 Construction deficiencies.

.10 Documentation process.

12.2.5 The Contractor shall include relevant inspection and testing milestones within the Construction Progress Schedule. Relevant milestones must also be captured in the Contractor's Three-Week Look-Ahead Schedule.

12.3 INSPECTION

12.3.1 Allow City Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

12.3.2 Give timely notice requesting inspection if Work is designated for special test, inspections or approvals by City Representative instructions, or law of Place of Work.

12.3.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

12.3.4 City Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

12.4 INDEPENDENT INSPECTION AGENCIES

12.4.1 Unless indicated otherwise, independent Inspection/ Testing Agencies may be engaged by City Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.

12.4.2 Employment of inspection/ testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

12.4.3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by City Representative at no cost to Owner. Pay costs for retesting and reinspection.

12.5 ACCESS TO WORK

12.5.1 Allow inspection/ testing agencies access to Work, off site manufacturing and fabrication plants.

12.5.2 Cooperate to provide reasonable facilities for such access.

12.6 PROCEDURES

12.6.1 Notify appropriate agency and City Representative in advance of requirement for tests, in order that attendance arrangements can be made.

12.6.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

12.6.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

12.7 REJECTED WORK

12.7.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by City Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

12.7.2 Make good other Contractor's work damaged by such removals or replacements promptly.

12.7.3 If in opinion of the City Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by City Representative.

12.8 REPORTS

12.8.1 Submit inspection and test reports to City Representative.

12.8.2 Provide copies to Subcontractor of work being inspected or tested.

12.9 SPECIAL INSTRUCTIONS

12.9.1 Compaction Testing:

.1 Complete compaction tests as per the requirement of the Contract Documents, when performing trenching, bedding and backfilling work.

.2 All material testing (backfill densities and concrete testing) shall be performed by an accredited agency and certified by a Professional Engineer using equipment approved by the City. All test results shall be submitted to the City Representative with a report indicating any deficiencies and remediation.

12.9.2 Pressure Tests:

.1 Complete pressure tests for new pipeline installations to verify installation meets required design and operating scenarios.

.2 Visual inspections of all lines are required prior to Substantial Certificate of Completion. Any deflections, sags obstructions and other defects affecting the performance of the line shall be corrected and the line re-inspected prior to Substantial Certificate of Completion.

END OF SECTION

13. TEMPORARY UTILITIES

13.1 INSTALLATION AND REMOVAL

13.1.1 Provide temporary utilities controls in order to execute work expeditiously.

13.1.2 Remove from site all such work after use.

13.2 DEWATERING

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

13.3 WATER SUPPLY

13.3.1 Provide continuous supply of potable water for construction use.

13.3.2 Arrange for supply and appropriate utility company and pay all costs for installation, maintenance and removal.

13.3.3 Pay for utility charges at prevailing rates.

13.4 TEMPORARY HEATING AND VENTILATION

13.4.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

13.4.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

13.4.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture condensation on surfaces.

.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

13.4.4 Provide adequate ventilation to meet health regulations for safe working environment.

13.4.5 Ventilating:

.1 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.2 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.3 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

13.4.6 Permanent heating system of building may be used when available. Be responsible for damage to heating system if use is permitted.

13.4.7 On completion of Work for which permanent heating system is used, replace filters, seals, etc. to ensure system is 'like-new' at substantial completion.

13.4.8 Pay costs for maintaining temporary heat, when using permanent heating system.

13.4.9 Maintain strict supervision of operation of temporary heating and ventilating equipment and be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

13.5 TEMPORARY POWER AND LIGHT

13.5.1 Pay for temporary power during construction for temporary lighting and operating of power tools.

13.5.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

13.5.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

13.5.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

13.5.5 Connect to power supply in accordance with Canadian Electrical Code and provide meters and switching.

13.5.6 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of City Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

13.6 TEMPORARY COMMUNCATION FACILITIES

13.6.1 Provide and pay for cell phone usage for own use. Provide and pay for connection to Internet for own use.

13.7 FIRE PROTECTION

13.7.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

13.7.2 Burning rubbish and construction waste materials is not permitted on site.

END OF SECTION

14. PRESERVATION AND PROTECTION

14.1 DESCRIPTION

14.1.1 This Section specifies requirements for preservation and protection of existing and new utilities, services, buildings and structures.

14.2 GENERAL

14.2.1 Comply with all requirements and regulations of the City of Iqaluit and Utility Companies, especially those pertaining to protective work, inspection and safety.

14.3 MAINTENANCE AND PROTECTION OF EXISTING UTILITIES, SERVICE, STRUCTURES AND PROPERTIES

14.3.1 The Contractor will be held fully responsible by the Owner for any damage to utilities, services, properties, buildings, or structures adjacent to or in the general area of the work, through settlement of ground, vibration or shock resulting from any cause relating to the work carried out under this Contract. Make good and repair all such damage at own expense.

14.3.2 The Contractor shall supply and install the shoring, bracing and support system at his own judgment and at his own cost to protect the existing utilities, services, buildings and structures from damage for the duration of the construction. The cost for this item shall be included in the tender price and the contractor shall not make any claim against the Owner for extra work on this item.

14.3.3 Confirm all underground services to locate, stake and clearly mark in the field all services which are located on or near the line of the proposed work.

14.3.4 Sustain in their places and protect from direct or indirect injury, all water and gas mains, sewers and drains, conduits, cables, service pipes, poles, sidewalks, curbs, embankments, structures, equipment and other property in the vicinity of the work.

14.3.5 Sustain and support structures that are uncovered, weakened, endangered or threatened.

14.3.6 Notify the City Representative immediately (and follow up in writing) if and when any damage to such facilities occur during the planned execution of work. Provide all necessary written documentation such as incident reports, accident reports, investigative reports and preventative measures to be implemented within 48 hours of any incident taking place, in a format that clearly identifies details such as the report author, his/her role in the project, the company the author represents, date, signature, etc., all on Company letterhead.

14.3.7 Repair immediately all items that are damaged during construction, at no cost to the Owner.

14.3.8 Immediately report all damages occurred on the plant's property, existing services and structure during construction to the City Representative.

14.3.9 Prevent dust and dirt from entering existing buildings or areas where equipment is stored or is operating.

14.3.10 Prevent dust, water or other deleterious substances from entering areas with existing electrical, heating, ventilating, pumping and other equipment. The Contractor will be held responsible for any damage caused by work carried out under this Contract.

14.3.11 Where existing wall sections are removed or where pipes are installed through existing walls or where any dust-generating operation is necessary, provide a suitable temporary wall or enclosure suitably reinforced and sealed to prevent dust or water entering the area. When work is completed, remove temporary dust control device and thoroughly clean all areas affected by the work.

14.3.12 Control groundwater level to prevent damage to any pipe or structure due to water pressure during and after construction and until the completed works are accepted.

14.3.13 Control vibration levels to prevent damage to concrete work during construction, existing structures, equipment, and utilities. Control use of vibration producing construction techniques or equipment.

14.4 PROTECTION, SOUNDNESS AND REPAIR OF NEW CONSTRUCTION

14.4.1 Protect all newly constructed work from damage. Prevent heavy loading of newly constructed work and repair all damage. Construct all works watertight and correct all imperfect work.

14.4.2 If, in the final inspection, any deficiencies are found, repair or replace the defective work. Be responsible for satisfactory maintenance and repair of all work undertaken for the specified guaranteed maintenance period. Protect and store all equipment supplied under this Contract.

14.5 PROTECTION AGAINST FREEZING

14.5.1 Furnish all necessary temporary hoarding, heating equipment and fuel for heated workspaces where required, in order to ensure installation of equipment and materials are performed per the specifications and guidelines of manufacturer.

14.6 SURVEY MONUMENTS

14.6.1 Maintain survey monuments, iron bars, round iron pipes and stakes for marking property boundaries and locations.

14.6.2 Where monuments, pipes or stakes are located on the line of the trench or within the limits of the work, the Contractor shall report to the City Representative.

14.6.3 Do not remove survey monuments without receiving prior approval. Pay for or replace monuments which were removed without approval.

END OF SECTION

15. MATERIALS AND EQUIPMENT

15.1 GENERAL

15.1.1 Provide all materials and equipment new. Reconditioned equipment is not acceptable.

15.1.2 Co-operate with other trades prior to installation of work under the contract. Should the Contractor fail to do so, such works, if required, shall be removed, relocated and/or modified as directed by the City Representative, without additional cost to the Owner.

15.1.3 Should the Contractor fail to correspond with requests, or should they misdirect other trades, such corrections and/or additional work, as directed by the City Representative, shall be at the Contractor's expense.

15.1.4 Work shall be performed in accordance with the Safety Act and Regulations.

15.2 SUBMITTALS

15.2.1 Make submittals in accordance with Section 10 – Submittal Procedures.

15.2.2 Submit shop drawings and product data sheets, as described in the Contract Documents, for all civil, structural, architectural, building mechanical, process mechanical, electrical, instrumentation and communication installations.

15.3 EQUIPMENT DELIVERY AND INSPECTION

15.3.1 Deliver products in accordance with accepted current progress schedule and coordinate to avoid conflict with the Work and conditions at site. Coordinate the delivery of materials and equipment in advance of the work in order to ensure there are no impacts to downstream installation activities.

15.3.2 Deliver products in undamaged condition, in manufacturer’s original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.

15.3.3 Unload products in accordance with manufacturer’s instructions for unloading or as specified. Record receipt of products delivered to the site. Inspect for completeness and evidence of damage during shipment.

15.3.4 Remove damaged products from site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

15.3.5 Allow for the City Representative to inspect materials delivered to site as requested by the City.

15.4 HANDLING, STORAGE, AND PROTECTION

15.4.1 Handle and store products in accordance with manufacturer’s written instructions and in a manner to prevent damage. Provide manufacturer’s recommended maintenance during storage, installation, and until products are accepted for use by Owner.

15.4.2 Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.

15.4.3 Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures as per manufacturer's instructions. Protect electrical, instrumentation, and control products, and insulation against moisture, water, and dust damage. Connect and operate continuously all space heaters furnished in electrical equipment.

15.4.4 Store fabricated products above ground on blocking or skids and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

15.4.5 Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.

15.4.6 Hazardous Materials: Prevent contamination of personnel, storage building, and site. Meet requirements of product specification, codes, and manufacturer's instructions.

END OF SECTION

16. CONSTRUCTION FACILITIES

16.1 MOBILIZATION

16.1.1 Mobilization shall include, but not be limited to, the following items:

.1 Obtaining required permits.

.2 Filing necessary notices with WSCC.

.3 Moving in the Contractor's field offices and equipment required within the first month after issuance of the Commence Work Order.

.4 Providing temporary construction fencing to prevent unauthorized access to the work area before starting construction on site.

.5 Providing temporary construction roads and signage if required.

.6 Providing temporary construction power, wiring, and lighting facilities.

.7 Providing onsite communication facilities, including telephones and internet services.

.8 Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.

.9 Arranging for and erection of Contractor's work and storage yard including temporary fencing.

.10 Posting required notices and establishing safety programs and procedures.

.11 Coordinate safety programs and procedures with the Owner.

.12 Having Contractor's superintendent at site full time.

.13 Removing debris and trash, etc. as needed for Contractor to gain access to do the Work.

16.1.2 Use area designated for Contractor's temporary facilities as shown in the Contract Documents.

16.2 INSTALLATION AND REMOVAL

16.2.1 Provide construction facilities in order to execute work expeditiously.

16.2.2 Remove from site all such work after use.

16.3 SCAFFOLDING

16.3.1 Provide and maintain scaffolding, ramps, ladders, platforms and temporary stairs.

16.4 HOISTING

16.4.1 Provide, operate and maintain hoists cranes required for moving of materials and equipment. Make financial arrangements with Subcontractors for use thereof.

16.4.2 Hoists cranes shall be operated by qualified operator.

16.5 STAGING AREA

16.5.1 The staging area (the Contractor's laydown area) as shown within the contractor documents.

16.6 SITE STORAGE/ LOADING

16.6.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

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

16.6.3 Ensure that any aerosol or gas products are stored according to manufacturer's written instructions in a securely locked facility.

16.7 CONSTRUCTION PARKING

16.7.1 Parking will be permitted on site provided it does not disrupt performance of Work or interfere with access, egress and parking for neighboring sites, or local traffic.

16.7.2 Provide and maintain adequate access to project site.

16.7.3 Build and maintain temporary roads where indicated or required and provide snow removal during period of Work.

16.8 SECURITY

16.8.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

16.9 OFFICES

16.9.1 Provide office heated to 22°C, lighted 750 lx and ventilated, of sufficient size to accommodate site office, eating area for workers, and furnished with drawings laydown table. Furnish site trailer as required.

16.9.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

16.9.3 Subcontractors may provide their own offices as necessary. Direct location of these offices to be approved by the City Representative.

16.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

16.10.1 1Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

16.10.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

16.10.3 Stored materials and debris on site must be secured and contained within the construction site, so not to disturb the general public.

16.11 SANITARY FACILITIES

16.11.1 Provide lockable sanitary facilities for work force in accordance with governing regulations and ordinances.

16.11.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

16.12 CONSTRUCTION SIGNAGE

16.12.1 Provide and erect, within 5 working days prior to construction mobilization, a project sign in a location designated by the City Representative.

16.12.2 Provide a construction sign 1220 x 2440mm, of plywood construction painted with exhibit lettering produced by a professional sign painter. Details of sign message to be provided to City Representative for review/ approval prior to fabrication. Wording shall in in Inuktitut, English and French official languages.

16.12.3 Provide site sign temporary mounting comprising foundation, framing, and supports.

16.12.4 Direct requests for approval to erect a Contractor signboard to City Representative. For consideration general appearance of Contractor signboard must conform to project identification site sign. Wording shall in in Inuktitut, English and French official languages.

16.12.5 Signs and notices for safety and instruction shall be in all Nunavut official languages graphic symbols.

16.12.6 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project, or earlier if directed by City Representative.

16.13 CLEAN-UP

16.13.1 Remove construction debris, waste materials, packaging material from work site daily.

16.13.2 Clean dirt or mud tracked onto paved or surfaced roadways.

16.13.3 Store materials resulting from demolition activities that are salvageable.

16.13.4 Stack stored new or salvaged material not in construction facilities.

END OF SECTION

17. TEMPORARY BARRIERS AND ENCLOSURES

17.1 INSTALLATION AND REMOVAL

17.1.1 Provide temporary controls in order to execute Work expeditiously.

17.1.2 Remove from site all such work after use.

17.2 GUARD RAILS AND BARRICADES

17.2.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

17.2.2 Provide concrete jersey barriers for use as barricades around deep excavation sites, and as a means to separate vehicular traffic, or in any other circumstances at the City's request.

17.2.3 Provide as required by governing authorities.

17.3 WEATHER ENCLOSURES

17.3.1 Provide weather tight enclosures to unfinished door and window openings, tops of shafts and other openings in floors, walls, and roofs.

17.3.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

17.3.3 Design enclosures to withstand wind pressure and snow loading.

17.4 DUST TIGHT SCREENS

17.4.1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

17.4.2 Maintain and relocate protection until such work is complete.

17.5 ACCESS TO SITE

17.5.1 Provide and maintain access roads, crossings, ramps and construction access routes as may be required for access to Work.

17.5.2 Provide temporary fencing around perimeter of Work site, in order to delineate construction site from the public.

17.6 PUBLIC TRAFFIC FLOW

17.6.1 Provide and maintain competent signal flag operators, barricades and lights as required to perform Work and protect the public.

17.6.2 Refer to Section 5 – Special Project Procedures (Traffic Control).

17.7 FIRE ROUTES

17.7.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

17.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

17.8.1 Protect surrounding private and public property from damage during performance of Work.

17.8.2 Be responsible for damage incurred.

17.9 PROTECTION OF BUILDING FINISHES

17.9.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

17.9.2 Provide necessary screens, covers, and hoardings.

17.9.3 Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

18. CLOSEOUT PROCEDURES

18.1 SECTION INCLUDES

18.1.1 Administrative procedures preceding preliminary and final inspections of Work.

18.2 INSPECTION AND DECLARATION

18.2.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents:

.1 Notify City Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request City Representative's Inspection.

18.2.2 City Representative's Inspection: City Representative and Contractor will perform inspection of work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

18.2.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and are fully operational.

.4 Certificates required by other Regulatory Agencies have been submitted.

.5 Operation of systems have been demonstrated to Owner's personnel.

.6 Work is complete and ready for final inspection.

18.2.4 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, City Representative, and Contractor. If Work is deemed incomplete, complete outstanding items and request reinspection.

18.2.5 Declaration of Substantial Performance: when Owner and City Representative consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. No later than 21 calendar days after receipt of application, City Representative will review Work to verify validity of application, and no later than 7 calendar days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

18.2.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

18.2.7 Final Payment: when Owner and City Representative consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed

incomplete by Owner and City Representative, complete outstanding items and request reinspection. City Representative will, no later than 21 calendar days after receipt of an application for final payment, review Work to verify validity of application. City Representative will give notification that application is valid or give reasons why it is not valid, no later than 7 calendar days after reviewing Work

18.2.8 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with terms of payment.

END OF SECTION

19. CLOSEOUT SUBMITTALS

19.1 SECTION INCLUDES

19.1.1 As-built, samples, and terms of reference.

19.1.2 Equipment and systems.

19.1.3 Product data, materials and finishes, and related information.

19.1.4 Operations and maintenance data.

19.1.5 Spare parts, special tools and maintenance materials.

19.1.6 Warranties and bonds.

19.1.7 Final site survey.

19.2 SUBMISSION

19.2.1 Make submittals in accordance with Section 10 – Submittal Procedures.

19.2.2 Prepare inspections and data using personnel experience in maintenance and operation of described products.

19.2.3 Copy will be returned after final inspection, with City Representative's comments.

19.2.4 Revise content of documents as required prior to final submittal.

19.2.5 Provide evidence as to type, source and quality of products provided as part of the Work.

19.2.6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

19.2.7 Pay costs of transportation.

19.3 AS-BUILTS AND SAMPLES

19.3.1 In addition to requirements in General Conditions, maintain at the site on record copy of:

.1 Contract Drawings.

.2 Terms of Reference.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test reports.

.7 Inspection certificates.

.8 Manufacturer's certificates.

19.3.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

19.3.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

19.3.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

19.3.5 Keep record documents and samples available for inspection by City Representative.

19.4 RECORDING ACTUAL SITE CONDITIONS

19.4.1 Record information on set of blue line opaque drawings.

19.4.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

19.4.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

19.4.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction.

19.5 EQUIPMENT AND SYSTEMS

19.5.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

19.5.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

19.5.3 Include installed colour coded wiring diagrams.

19.5.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

19.5.5 Maintenance Requirements: include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

19.5.6 Providing servicing and lubrication schedule, and list of lubricants required.

19.5.7 Include manufacturer’s printed operation and maintenance instructions.

19.5.8 Include sequence of operation by controls manufacturer.

19.5.9 Provide original manufacturer’s parts list, illustrations, assembly drawings, and diagrams required for maintenance.

19.5.10 Provide installed control diagrams by controls manufacturer.

19.5.11 Provide Contractor’s coordination drawings, with installed colour coded piping drawings.

19.5.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagram.

19.5.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

19.5.14 Include test and balancing reports as specified in Section 10 – Quality Control.

19.5.15 Additional requirements: as specified in individual terms of reference sections.

19.6 MATERIALS AND FINISHES

19.6.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering products.

19.6.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

19.6.3 Moisture-protection and Weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

19.6.4 Additional Requirements: as specified in individual terms of reference sections.

19.7 SPARE PARTS

19.7.1 Provide spare parts, in quantities specified in individual terms of reference sections.

19.7.2 Provide items of same manufacturer and quality as items in Work.

19.7.3 Deliver to site; place and store in location designated by City Representative.

19.7.4 Receive and catalogue all items. Submit inventory listing to City Representative. Include approved listings in Maintenance Manual.

19.7.5 Obtain receipt for delivered products and submit prior to final payment.

19.8 MAINTENANCE MATERIALS

19.8.1 Provide maintenance and extra materials, in quantities specified in individual terms of reference sections.

19.8.2 Provide items of same manufacturer and quality as items in Work.

19.8.3 Deliver to site; place and store in location designated by City Representative.

19.8.4 Receive and catalogue all items. Submit inventory listing to City Representative. Include approved listings in Maintenance Manual.

19.8.5 Obtain receipt for delivered products and submit prior to final payment.

19.9 STORAGE, HANDLING AND PROTECTION

19.9.1 Store spare parts, maintenance materials, and special tools in manger to prevent damage or deterioration.

19.9.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

19.9.3 Store components subject to damage from weather in weatherproof enclosures.

19.9.4 Store paints and freezable materials in a heated and ventilated room.

19.9.5 Remove and replace damaged products at own expense and to satisfaction of City Representative.

19.10 PRE-WARRANTY CONFERENCE

19.10.1 Meet with City Representative, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by City Representative.

19.10.2 City Representative will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

19.10.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

19.10.4 Ensure contact is located within local service area and warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

19.11 WARRANTIES AND BONDS

19.11.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

19.11.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

19.11.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) working days after completion of the applicable item of work.

19.11.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

19.11.5 Verify that documents are in proper form, contain full information, and are notarized.

19.11.6 Co-execute submittals when required.

19.11.7 Retain warranties and bonds until time specified for submittal.

END OF SECTION

Other Documents

1. Geotechnical Investigation

2. NWB – Type A Water Licence No. 3AM-IQA1626

GEOTECHNICAL INVESTIGATION
2022 DRAINAGE IMPROVEMENTS
IQALUIT, NU

FINAL REPORT

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PROJECT NUMBER:
IQA-G2220

SUBMITTED:
November 4, 2022

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1.0 Introduction

Adaptive Baseline Geotechnical Limited (ABG) has carried out the following geotechnical investigation of various areas of interest for culverts or drainage issues throughout the City of Iqaluit, NU. The geotechnical investigation presented herein has been carried out in general accordance with the most recent editions of the National Standard of Canada CAN/BNQ 2501-500/2017 *Geotechnical Site Investigations for Building Foundations in Permafrost* and Canada Standards Association (CSA) PLUS 4011:19 *TECHNICAL GUIDE Infrastructure in permafrost: A guide for climate change adaptation*.

ABG's geotechnical personnel conducted a site-specific geotechnical borehole drilling program as part of this investigation. All third-party information reviewed by ABG has been taken at face value.

2.0 Project Background and Understanding

The City of Iqaluit is proposing improvements to several drainage paths and existing culverts throughout Iqaluit, NU. The areas of interest for the geotechnical investigation, as identified within the RFP for this project, included; Palaugaa Drive (between Apex Road & House 670), Apex Road (between Hospital & Paunna Street) and three existing culverts identified for replacement (under QEW near DJs, under Nipisa Street near Nunavut Country Foods and under Sinaa Street near Grind and Brew). The purpose of the geotechnical investigation presented herein is to assess the surface and subsurface conditions at the sites via a prescribed number of boreholes and provide geotechnical recommendations to support the design and construction of the improvements.

3.0 Scope of Services

Based on our current understanding of the project requirements, the following scope of services was completed for this portion of the project:

- ***Compilation and Review of Available Information:*** ABG compiled and reviewed available information related to climate, site topography, surface drainage features and subsurface conditions.
- ***Geotechnical Field Program:*** A field engineer from ABG visited the areas of interest throughout the city and conducted a geotechnical field program using a local air-rotary drill rig. The primary objective was to assess subsurface conditions at each location and evaluate the presence of ice-rich soils, soil gradations and depth to bedrock.
- ***Laboratory Testing:*** ABG conducted a laboratory testing program sufficient to classify the soils encountered, verify in-situ moisture/ice contents, gradations and porewater salinity.
- ***Geotechnical Reporting:*** ABG prepared this geotechnical report summarizing the observations and findings of the borehole investigation and laboratory testing program with recommendations to support the design and construction of the proposed improvements.

4.0 Available Information

ABG has reviewed the following available information as part of this geotechnical investigation:

1. (CGD, 2020a). Geotechnical Investigation, Ecole Trois Soleils Expansion Footprint, Iqaluit, NU;
2. (CGD, 2020b). Geotechnical Investigation, Long Term Care Facility, Site A (Lot 21, Block 215, Plan 3333, Iqaluit, NU;
3. (CGD, 2020c). Geotechnical Investigation, Long Term Care Facility, Site C (Lot 35, Block 242, Plan 4716, Iqaluit, NU;
4. (CGD, 2020d). Geotechnical Investigation, Recovery Centre Building, Toonik Site, Iqaluit, NU;
5. (CGD, 2020e). Geotechnical Investigation, Wellness Hub, Lot 17 & 18, CLSR 56039, Iqaluit, NU;
6. (CGD, 2020f). Pile Installation Summary Report, New Multiplex, Joamie Court, Lots 7 and 8, Block 242, Plan 4716, Iqaluit, NU;
7. (CGD, 2020g). Pile Installation Summary Report, New Multiplex, Tundra Ridge, Lots 9 and 10, Block 217, Iqaluit, NU;
8. (CGD, 2020h). Pile Installation Summary Table, Joamie Court Lot 31, Iqaluit, NU;
9. (CGD, 2020i). Pile Installation Summary Table, Nakasuk School Stairs and Ramp Replacement, Iqaluit, NU;
10. (CGD, 2019a). Pile Installation Report, Northern Store Warehouse Addition, Iqaluit, NU;
11. (CGD, 2019b). Pile Installation Summary Table, North Mart Ramp;
12. (exp, 2016a). Geotechnical Investigation, North Mart Site, Iqaluit, NU;
13. (exp, 2016b). Geotechnical Investigation, Proposed Joamie Subdivision, Iqaluit, NU;
14. Available satellite imagery, Google Earth (2003 to 2020);
15. Available LIDAR survey for the community;
16. Environment Canada, historical weather data for the community of Iqaluit, NU; and
17. Studies and literature related to the distribution of saline permafrost and ground temperature data throughout Nunavut (i.e. Canadian Geotechnical Journals).

5.0 Field Program Methodology

The geotechnical field program was carried out on October 3 and 4, 2022. The field program consisted of drilling 8 boreholes (3 along Palaugaa Drive, 2 along Apex Road and 3 at the identified culverts for replacement, in general accordance with the RFP document). Boreholes BH04 and BH07 were drilled near possible low spots, whereas the remaining boreholes were drilled as near as possible to existing culvert installations. The borehole locations are shown on Figure 1.

Boreholes were advanced to a depth of 4.0 to 6.6 meter below grade (mbg) using an air-rotary drill. The field program was supervised on a full-time basis by one of ABG's field technicians experienced with air-track drilling and permafrost soils. Soil samples were collected at regular intervals from drill cuttings

returned to the surface and visually examined and logged in accordance with ASTM D2487 (Standard Practice for Classification of Soils for Engineering Purposes, Unified Soil Classification System), ASTM D 2488 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure) and ASTM D 4083-8 (Standard Practice for Description of Frozen Soils, Visual-Manual Procedure).

Collected soil samples were stored in moisture tight containers and transported to a southern laboratory for further classification and testing. Prior to sample shipment, the initial weights were obtained for all samples to ensure that the moisture contents obtained were representative. Laboratory testing included the determination of natural moisture contents, salinity and grain-size analyses on select samples.

Borehole locations were determined in the field using a commercial grade handheld GPS unit (reported accuracy of ± 3 m). All depths reported herein are referenced to mbg as the boreholes have not been tied into the site-specific topographical information at this time.

6.0 Historical Climate and Permafrost Conditions

Iqaluit is located at 63° 76 N and 68° 54' W on the southeastern coast of Baffin Island, in the Qikiqtaaluk Region of Nunavut. Based on current permafrost mapping, the community is located within the zone of continuous permafrost.

Mean Annual Air Temperature (MAAT) and Indices: A review of Environment Canada climate records for the community revealed a relatively complete set of historical monthly air temperatures spanning the period from 1981 to 2010. The data indicates the mean annual air temperature (MAAT) over this time period was -9.2℃ and the average thawing and freezing indices were about 660℃-days and 4029℃-days respectively.

Active Layer Thickness: Based on the above-noted historical air temperature data, simplified empirical methods and available active layer thickness information (including numerous community-specific thermistors we have recent data from), we estimate that the maximum active layer thickness currently varies between approximately 1.3 and 2.2 m, depending on site-specific variables (such as surficial cover, site drainage, sun exposure and in-situ moisture content). Available ground temperature data throughout Iqaluit suggests a current active layer thickness of 2.2 m at the site.

Mean Annual Ground Temperature (MAGT): Based on a review of available ground temperature data throughout Iqaluit, we have assumed a current MAGT of -4.2℃ at the site.

7.0 Subsurface Conditions

The presented information depicts subsurface conditions only at specific locations and the identified soil boundaries are intended to reflect approximate transition zones for geotechnical design and should not be interpreted as exact planes of geological change for estimation or construction purposes. It is recommended that the subsurface conditions be further evaluated/confirmed at the time of construction by a geotechnical engineer experienced with northern construction and registered with Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG), or their representative.

In general, the eight boreholes advanced during this investigation encountered sand with silt and gravel, sand with silt, sand with gravel, silty sand with gravel or silty sand. Bedrock was encountered in two boreholes and signs of ice-rich soils were encountered at depth in BH02 and BH04.

The principal strata encountered during the investigation are outlined in the following table and subsections. Further details are provided within the attached borehole logs.

TABLE 1 - Borehole Summary

Location	Total Depth (mbg)	Soil Stratigraphy Thickness (m)		Inferred Depth to Bedrock (mbg)
		SAND with silt to SAND with gravel to SAND with silt and gravel	Silty sand with gravel to silty SAND	
BH01	6.6	0.0 - 6.6	-	> 6.6
BH02	6.6	0.0 - 6.6	-	> 6.6
BH03	6.6	0.0 - 3.4 / 6.4 - 6.6	3.4 - 6.4	> 6.6
BH04	6.6	0.0 - 3.4	3.4 - 6.6	> 6.6
BH05	6.6	0.0 - 1.9	1.9 - 6.6	> 6.6
BH06	4.0	0.0 - 4.0	-	> 4.0
BH07	5.0	0.0 - 3.7	-	3.7
BH08	6.6	0.0 - 5.2	5.2 - 6.6	5.2

7.1 Soils

The soils throughout the explored areas consisted primarily of a light brown sand. The soils below the active layer appeared to be well-bonded with no excess ice to zones of visible excess ice noted at the time of drilling (N_{bn} to N_{be}). The moisture content for thirty-three samples obtained throughout the soils ranged from 3.2 to 11.2%, with an average of 7.3%. Gradation and moisture content test results for the samples tested from the investigation are summarized in the following table and shown in greater detail on the attached laboratory test results.

TABLE 2 - Soils Gradation and Moisture Content Summary

Location	Sample	Depth (mbg)	Soil Fraction (%)			Moisture Content (%)	Soil Description
			Gravel	Sand	Silt		
BH01	S1	0.3	37	57	6	8.3	Well-graded SAND with silt and gravel
BH01	S2	1.5	30	65	5	10.5	Poorly-graded SAND with silt and gravel
BH01	S3	3.0	30	63	7	11.2	Poorly-graded SAND with silt and gravel
BH01	S4	5.0	27	66	7	9.4	Poorly-graded SAND with silt and gravel
BH01	S5	6.5	30	63	7	9.3	Poorly-graded SAND with silt and gravel
BH02	S1	0.5	21	73	6	5.5	Poorly-graded SAND with silt and gravel
BH02	S2	2.0	43	53	4	5.7	Well-graded SAND with gravel
BH02	S3	4.0	29	66	5	10.3	Poorly-graded SAND with silt and gravel
BH02	S4	6.0	31	60	9	6.7	Poorly-graded SAND with silt and gravel
BH03	S1	0.5	29	63	8	3.8	Poorly-graded SAND with silt and gravel
BH03	S2	2.0	23	68	9	4.9	Well-graded SAND with silt and gravel

TABLE 2 - Soils Gradation and Moisture Content Summary

Location	Sample	Depth (mbg)	Soil Fraction (%)			Moisture Content (%)	Soil Description
			Gravel	Sand	Silt		
BH03	S3	3.5	19	66	15	8.0	Silty SAND with gravel
BH03	S4	5.0	8	77	15	7.6	Silty SAND
BH03	S5	6.5	12	78	10	7.5	Poorly-graded SAND with silt
BH04	S1	0.5	31	57	12	5.0	Poorly-graded SAND with silt and gravel
BH04	S2	2.0	31	64	5	9.5	Well-graded SAND with gravel
BH04	S3	3.5	19	62	19	8.5	Silty SAND with gravel
BH04	S4	5.0	16	64	20	10.1	Silty SAND with gravel
BH04	S5	6.5	10	69	21	10.9	Silty SAND
BH05	S1	0.5	36	61	3	5.6	Poorly-graded SAND with gravel
BH05	S2	2.0	17	71	12	7.9	Silty SAND with gravel
BH05	S3	3.5	11	77	12	9.5	Silty SAND
BH05	S4	5.0	10	76	14	9.6	Silty SAND
BH05	S5	6.5	12	68	20	8.6	Silty SAND
BH06	S1	0.5	7	84	9	6.5	Well-graded SAND with silt
BH06	S2	2.0	25	71	4	8.9	Poorly-graded SAND with gravel
BH06	S3	3.5	16	77	7	9.3	Well-graded SAND with silt and gravel
BH07	S1	0.5	35	59	6	3.9	Well-graded SAND with silt and gravel
BH07	S2	2.0	20	76	4	6.1	Poorly-graded SAND with gravel
BH07	S3	3.5	18	76	6	4.2	Well-graded SAND with silt and gravel
BH08	S1	0.5	28	68	4	4.9	Well-graded SAND with gravel
BH08	S2	2.0	43	53	4	3.8	Well-graded SAND with gravel
BH08	S3	3.5	43	53	4	3.2	Well-graded SAND with gravel
BH08	S4	5.0	34	63	3	5.8	Poorly-graded SAND with gravel

7.2 Bedrock

Based on available geological maps for the area, bedrock throughout the community consists of gneiss and granite bedrock. This has been verified by ABG. Bedrock was encountered during the drilling of two boreholes at depths ranging from 3.7 to 5.2 mbg. It is noted that the bedrock surface throughout Iqaluit can be highly variable and change by several meters over a short distance, with the upper 0.5 to 1.0 m or more being highly frost shattered and very severely fractured.

7.3 Groundwater

Groundwater seepage was observed during the drilling of BH04. Groundwater flow at the borehole locations is anticipated to be moderate during the spring freshet and may even be ponded below grade, travelling along the bottom of the active layer during thaw or top of bedrock. It is anticipated that these locations may have to contend with higher than average amounts of groundwater at the site during thaw. It is also anticipated that groundwater levels will fluctuate with seasonal weather trends, during precipitation events, and with significant site disturbance and construction activities.

7.4 Porewater Salinity

A total of thirty-three samples from this investigation were tested for salinity in general accordance with ASTM D 4542-95 (Pore Water Extraction and Determination of the Soluble Salt Content of Soils by Refractometer) and standard methodologies. The salinity test results ranged from 0.0 to 12 parts per thousand (ppt), with an average of 3.6 ppt. ABG has assumed a porewater salinity of 10 ppt for soils at the tested locations.

8.0 Climate Change in Foundation Design

Based on the above, it is anticipated that the current maximum active layer thickness is approximately 2.2 m and the current MAGT is -4.2℃. Changes to the active layer thickness and MAGT throughout the life of the structure will depend on many variables, possibly including but not limited to actual current values, changes to the MAAT, snow cover, precipitation, surface/groundwater flow, material gradation and in-situ ice content.

CSA PLUS 4011:19 provides that under a high green house gas scenario the MAAT in Iqaluit is estimated to increase by approximately 2.4℃ over the next 30 years (by 2052) compared to the historic temperature trends which were available up to 2010. It is noted however, that recent research infers that greenhouse gas emissions over the next 30 years and beyond may be even higher than previously anticipated and new scenarios continue to be produced by global experts. Therefore, accurately estimating what the active layer thickness and MAGT will be 30 years from now is well beyond the scope of this investigation.

To support the current project, we have adjusted the historical temperature data to incorporate the above-noted changes to the MAAT and utilized the same simplified empirical methods from Section 6.0 to generate a future estimate for the maximum active layer thickness. We have also assumed (conservatively) that the MAGT will change in step with the MAAT. This process results in an estimated maximum active layer thickness of 2.7 m and MAGT of -1.8℃ in 30 years time, with the current estimates for climate change in the community incorporated.

Given the inherent uncertainties surrounding the effects climate change and site development will have on active layer thickness and MAGT, we recommend introducing some additional conservatism wherever practical; therefore, a design active layer thickness of 3.0 m and design MAGT of -1.5℃ should be used for pile design.

9.0 Discussion and Recommendations

Based on the above, it is anticipated that the proposed culvert replacements will be founded on silty sand and gravel soil (either native or previously placed fill) at or near the current elevations. All locations are underlain by permafrost and bedrock was several meters below the current bearing levels in all cases. The soils encountered are moderately frost-susceptible and it is expected that the areas of interest will attract surface drainage by design; therefore, deeper than average seasonal thaw and increased heave should be expected.

In general, seasonal groundwater flow and the depth of thaw below grade, will reflect the surficial topography of an area. Concentrated drainage (flow) and/or poorly drained areas (low spots) will tend to

increase the depth of thaw, such that the permafrost table at the end of each active season will tend to reflect (somewhat) the surficial topography, with deeper/accentuated thaw through areas of flowing or ponded groundwater. For this reason, it is important that positive drainage be well established both upstream and downstream of the culvert installation; to minimize the depth of seasonal thaw beneath the culverts as much as possible and limit the amount of groundwater available for ice-lens formation during freeze back each year (limit heave as much as possible).

Recommendations to support the design and construction of the various features discussed with the design team are included below.

9.1 Culvert Replacements and Installations

Upon removal of the existing culverts and excavation to the design subgrade elevation, the base of the excavation should be inspected and proof rolled as directed by qualified geotechnical personnel onsite. Any soft soils identified during the geotechnical inspection or proof roll should be removed and replaced with compacted engineered fill to the satisfaction of geotechnical personnel. Given the soils encountered and anticipated subsurface conditions at the time of construciton, it may be prudent to assume at least 300 mm of coarse rock fill (i.e. 200 mm minus crushed stone) will be required as subgrade improvement beneath the bedding layer specified by the culvert manufacturer. Additional over-excavation and replacement may be required to create a suitable/stable subgrade, depending on the actual conditions encountered at the time of construction. Any over-excavation should be adequately graded to provide positive outlet, such that groundwater ponding below the culverts is minimizes. In this way, it is expected that southern style culverts should perform well.

The installation of larger box or arch culverts will require more attention, as these installations typically require a stable foundation. Although it is generally possible to control seasonal thaw/freeze beneath strip footings through the use of horizontal insulation (especially beneath unheated structures) the anticipated surface/groundwater flow through these areas will make this very unpredictable and unreliable in our opinion. Instead, we would recommend that any strip footings for the purpose of supporting larger and more expensive culvert installations be founded atop steel pipe piles. These piles can be either adfreeze or rock socket, with preference towards rock socket wherever sound bedrock has been identified within 8 mbg. The strip footing (concrete or steel beam) should than be underlain by a suitable thickness of void form to eliminate uplift forces from underlying soils during seasonal freeze back.

9.1.1 Excavation Conditions and De-Watering Requirements

It is anticipated that excavation may be undertaken with conventional mechanical equipment if the overburden throughout the target depth is fully thawed. It is noted that the vertical extent of the active layer beneath the ground surface will vary throughout the summer based on location and excavation of frozen soils may be required depending on final design and the timing of site work. It may be necessary to provide additional time to allow frozen soils to thaw between rounds of excavation. Alternatively, the contractor may wish to provide suitable equipment to rip/break out the frozen soils, the ease of this is a function of the grain size and moisture content at the time of freeze up (likely very difficult). Contractors should be aware of the challenges with excavating frozen soil, and the contractor may have to wait for the frozen soils to thaw or provide heating/hoarding to speed the process.

Excavations should comply with the current Occupational Health and Safety Act (OHSA). The subsurface soils are considered to be Type 3 and as such must be cut back at 1 Horizontal: 1 Vertical (1H:1V) from the bottom of the excavation when above the groundwater elevation. Excavations below the prevailing groundwater table are expected to slough and may eventually stabilize at a slope of 2.5H:1V to 3H:1V. It should be appreciated that seemingly stable frozen side slopes can quickly become unstable upon thaw and stopping this process in ice-rich soils can be very difficult; therefore, it is recommended that professional geotechnical personnel experienced with excavations in frozen soils be present throughout the work to evaluate more fully the soils encountered and provide input if needed. Potentially heavy seepage of surface and subsurface water into low lying areas or excavations should be expected. Any water that enters the areas/excavation(s) should be gathered via swales/ditches having positive outlet or led to adequately sized sumps equipped with pumps for immediate removal. Discharge of collected water should be conducted and controlled in a manner that does not induce erosion or transport of sediment and is in accordance with all applicable government requirements.

9.1.2 Backfill and Roadway Reinstatement

Excavations should be reinstated to as good or better than original condition, including the pavement structure. Engineered fill placed beneath, around and atop the culverts should conform to the manufacturer's recommendations for extent, gradation and compactness. Typically, this requires at least 300 mm of Type 1 material surround the culvert on all sides. Engineered fill used to backfill the remainder of the excavations/trenches as part of this project should comprise of well-graded sand and gravel meeting the gradation specifications provided in the table below. Other materials (common site material or best available locally derived material) may be suitable for use as engineered fill depending on moisture content and approval by the geotechnical engineer of record.

TABLE 3 - Recommended Gradation for Type 1, Type 2 and Select Subgrade Materials

Property	ASTM Test Method	Type 2 (Sub-Base)	Type 1 (Base)	Select Subgrade
Gradation (sieve/% passing)	–	–	–	–
150 mm	C136	–	–	100
75.0 mm	C136	100	–	–
37.5 mm	C136	–	–	–
25.0 mm	C136	50 – 100	100	50 – 100
19.0 mm	C136	–	75 – 100	–
9.5 mm	C136	–	50 – 85	–
4.75 mm	C136	20 – 55	35 – 65	20 – 60
2.0 mm	C136	–	25 – 50	–
0.425 mm	C136	5 – 35	15 – 30	–
0.300 mm	C136	–	–	5 – 40
0.150 mm	C136	–	–	2 – 30
0.075 mm	C117	0 – 8	5 – 8	0 – 20

The engineered fill should be placed in lifts appropriate for the compaction equipment being used and compacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD) determined for the material within 300 mm of finished subgrade elevation and to 95% of the SPMDD below this.

These levels of compaction can be readily obtained when the material is within approximately 2% of its optimum moisture content at the time of placement and lift thicknesses of 300 mm receive at least 6 full passes from a minimum 10-ton vibratory compactor. Thinner lift thicknesses may be required at the discretion of qualified geotechnical personnel based on the actual compaction equipment onsite.

Based on the soils encountered, the following asphalt and gravel surface pavement structures are considered suitable for reinstatement on the project:

TABLE 4 - Asphalt Pavement Design

Layer	Soil Subgrade (mm)	Bedrock Subgrade (mm)
Asphalt Concrete	90	90
Base gravel, Granular A	200	200
Sub-Base gravel, Granular B	300	150

TABLE 5 - Gravel Surface Pavement Design (Hanson Drive only)

Layer	Minimum Thickness (mm)
Base gravel, Granular A	200
Sub-Base gravel, Granular B	300
Select subgrade, Granular C	300

9.2 Swales/Detention Areas and Detention Berms

It is understood that swales and/or temporary detention areas may be created as part of this project, through a combination of excavation and material placement. It should be noted that removing a thickness of existing soils will deepen the active layer beneath that area, thawing at least that much current permafrost and result in some uncontrolled settlement. The presence of ponded water will then tend to drive seasonal thaw deeper and may exacerbate the situation over time depending on the actual extent of any thaw unstable soils present. For this reason it will be important to consider nearby infrastructure such as; roadways, utilidor piping, access vaults, building foundations to ensure a sufficient buffer or erosion control is provided to avoid unwanted damage. Additional recommendations can be provided on a case-by-case area specific basis upon request.

It is anticipated that excavated areas will become soft seasonally and some minimum thickness of coarse rock fill (i.e. 300 mm of 200 mm minus crushed rock fill) be provided to ensure a stable surface is maintained and act as erosion protection. Additional thicknesses may be required depending on the intention of the area and amount of flow anticipated. Detention berms should be established by placing material over the existing grades without removing any of the existing organics or native soils. A base layer of 200 mm minus crushed rock fill may be required beneath the berms throughout areas of thicker organics, such that the rock fill can penetrate into these softer surficial soils and create a stable subgrade for construction and stability. Engineered fill for detention berms should comprise suitably low

permeability sand and gravel, placed in lifts and compacted to 95% of the SPMDD determined for the material. Additional recommendations can be provided on an area specific basis upon request.

9.3 Rock Socket Steel Pipe Piles

Rock socket steel pipe piles carry the applied loads through a grouted bond between the pipe pile and the bedrock socket. The rock socket bond is used to resist both compression and uplift loads. The following table provides unfactored Ultimate Limit States (ULS) and Serviceability Limit States (SLS) rock socket bond capacities for anticipated pile diameters, as well as the required minimum embedment from a geotechnical perspective.

TABLE 6 - Rock Socket Pile Design Parameters

Pile Outside Diameter (mm)	Unfactored ULS Grout-to-Rock Bond Capacity (kPa)	SLS Grout-to-Rock Bond Capacity (kPa)	Minimum Embedment into Sound Bedrock (m)
114 to 141	1000	N/A	1.0

Notes: 1) ULS unfactored bond capacity is based on the use of 30 MPa grout through the rock socket.
2) ULS geotechnical resistance factor of 0.4 should be applied for compression loads.
3) ULS geotechnical resistance factor of 0.3 should be applied for tension loads.
4) Minimum embedment is based on engineering judgement taking into consideration the requirement to resist a design frost jacking force of 150 kPa through the design active layer thickness.

The minimum embedment presented above is intended to provide enough resistance to avoid frost jacking of piles based on the design active layer thickness. Given the difficulties in accurately estimating the active layer thickness, it is also recommended that a suitable bond breaker be provided through the design active layer thickness of each pile, or to within 0.3 m of the top of the rock socket bond zone, as a secondary measure. The bond breaker can be excluded if sound bedrock is encountered within 1 m of design grade.

It is noted that the frost jacking force of 150 kPa is a recommended design force based on anticipated soil conditions and the use of steel pipe piles; therefore, the design frost jacking force does not require the application of a load factor during pile design and shall be considered together with other uplift forces acting on the structure (i.e. wind) to determine the actual pile embedment/socket length required for final design.

For lateral design, we have estimated values of horizontal subgrade modulus based on the anticipated stratigraphy and our installation methods, as shown in the following table. If additional lateral capacity is required, ABG can work with the structural designer to determine a more specific lateral load capacity of the piles given the anticipated design loads and potentially less conservative assumptions (i.e. L-Pile analyses).

TABLE 7 - Estimated Horizontal Subgrade Modulus Values

Assumed Soil Profile	Depth (mbg)	Coefficient of Subgrade Reaction (k_s, kN/m^3)
Sand (thawed, active layer, above groundwater)	0.0	0
Sand (thawed, active layer, above groundwater)	0.1	1,000
Sand (thawed, active layer, above groundwater)	0.5	7,000
Sand (thawed, active layer, below groundwater)	1.0	9,000
Sand (thawed, active layer, below groundwater)	1.5	26,000
Sand (thawed, active layer, below groundwater)	2.0	51,000
Sand (thawed, active layer, below groundwater)	2.5	78,000
Sand (thawed, active layer, below groundwater)	2.9	90,000
Sand (frozen, permafrost)	3.0	95,000
Sand (frozen, permafrost)	3.5	106,000
Sand (frozen, permafrost)	4.0	118,000
Sand (frozen, permafrost)	4.5	130,000
Sand (frozen, permafrost)	5.0	142,000
Bedrock (grouted socket)	5.1	904,000
Bedrock (grouted socket)	5.5	975,000
Bedrock (grouted socket)	6.0	1,063,000
Bedrock (grouted socket)	6.5	1,152,000
Bedrock (grouted socket)	7.0	1,124,000
Bedrock (grouted socket)	7.5	1,329,000
Bedrock (grouted socket)	8.0	1,418,000

Notes: 1) Coefficient of subgrade reaction calculated for a 141 mm steel pipe pile.

It is noted that the bearing capacity of the piles may be reduced by improper seating of the pile on the bedrock or by poor bond at the grout/pile interface; therefore, the portion of the pile to be grouted must be free of paint, lacquer, oil and dirt. Each pile shall be vibrated into place to assure a good seat is achieved on sound bedrock.

To avoid group effect considerations, individual piles should be at least 3 pile diameters apart center to center. Further recommendations pertaining to consideration of group effect can be provided upon request if closer pile spacing is required.

The piles should be installed in pre-drilled oversize holes at least 50 mm larger than the pile diameter. The bedrock socket should be filled with an approved fast setting arctic grout, such as SIKA ARCTIC 100 or equivalent. The procedure for mixing, handling and installing the grout should be in accordance with the manufacturer's recommendations. Mix ratios of the grout should be closely monitored throughout placement to ensure proper ratios are utilized. Test cubes of the prepared grout should be cast and tested for Unconfined Compressive Strength (UCS) each day. If grout installation to the bottom of the rock socket is carried out in the wet, the grout must be tremied to the bottom to avoid dispersion and dilution.

The piles should be installed open ended through the grout and vibrated to assure a good seat as noted above. The remaining annular space between the pile and the hole should be filled with sand to the final

grade. Drill cuttings are suitable for this purpose. Loads should not be applied to the pile for at least three days after installation.

The use of a suitable thickness of void form between the underside of the structure and the ground surface is recommended to avoid unwanted uplift due to heave.

9.4 Adfreeze Steel Pipe Piles

Adfreeze steel pipe piles carry the applied loads through an adfreeze bond between the steel pipe and the sand slurry backfill/overburden. The adfreeze bond is used to resist both compression and uplift loads. The following table provides unfactored ULS and SLS adfreeze bond capacities for anticipated pile diameters, as well as the required minimum embedment from a geotechnical perspective.

It must also be noted that local equipment dictates the size and length of piles that can be safely installed in each community. In general, the heavy equipment available in smaller communities such as this can safely lift and install a 141 mm outside diameter (OD) steel pipe pile measuring up to 15 m in total length (including stickup above grade). For this reason, it may be necessary to utilize groups of two or more piles at a given location depending on the design and loading.

TABLE 8 - Adfreeze Pile Design Parameters

Pile Outside Diameter (mm)	Unfactored ULS Adfreeze Bond Capacity (kPa)	SLS Adfreeze Bond Capacity (kPa)	Minimum Embedment Below Finish Grade (m)
114 or 141	175	45	10.0

Notes: 1) ULS geotechnical resistance factor of 0.4 should be applied for compression loads.
2) ULS geotechnical resistance factor of 0.3 should be applied for tension loads.
3) SLS bond capacity based on 30 mm of creep over 30 years.
4) Minimum embedment is based on engineering judgement taking into consideration the requirement to resist a design frost jacking force of 150 kPa through the design active layer thickness and incorporating some additional embedment to help counter the possible unknown effects of climate change.

The adfreeze pile design parameters presented above include an adjustment for the anticipated effects that 10 ppt porewater salinity would have on freezing through the bond zone, as well as some additional reductions based on our engineering judgement to help counter the possible unknown effects of climate change over time. The minimum embedment presented above is intended to provide enough resistance to avoid frost jacking of piles based on the design active layer thickness (10.0 m embedment required for this aspect), as well as some additional embedment incorporated based on our engineering judgement to further help counter the possible unknown effects of climate change over time as much as practical.

Given the difficulties in accurately estimating the active layer thickness (due to its dependence on many site-specific variables), it is also recommended that a suitable bond breaker be provided through the design active layer thickness of each pile as a secondary measure.

The frost jacking force of 150 kPa is a recommended design force based on anticipated soil conditions and the use of steel pipe piles. Therefore, the design frost jacking force does not require the application of a load factor during pile design and shall be considered together with other uplift forces acting on the structure (i.e. wind) to determine the actual pile embedment/socket length required for final design.

For lateral design, we have estimated values of horizontal subgrade modulus based on the anticipated stratigraphy and our installation methods, as shown in the following table. If additional lateral capacity is required, ABG can work with the structural designer to determine a more specific lateral load capacity of the piles given the anticipated design loads and potentially less conservative assumptions (i.e. L-Pile analyses).

TABLE 9 - Estimated Horizontal Subgrade Modulus Values

Assumed Soil Profile	Depth (mbg)	Coefficient of Subgrade Reaction (k_s, kN/m^3)
Sand (thawed, active layer, above groundwater)	0.0	0
Sand (thawed, active layer, above groundwater)	0.1	1,000
Sand (thawed, active layer, above groundwater)	0.5	12,000
Sand (thawed, active layer, above groundwater)	1.0	35,000
Sand (thawed, active layer, above groundwater)	1.5	45,000
Sand (thawed, active layer, below groundwater)	2.0	62,000
Sand (thawed, active layer, below groundwater)	2.5	78,000
Sand (thawed, active layer, below groundwater)	3.0	93,000
Sand (frozen, permafrost)	3.1	95,000
Sand (frozen, permafrost)	3.5	106,000
Sand (frozen, permafrost)	4.0	118,000
Sand (frozen, permafrost)	4.5	130,000
Sand (frozen, permafrost)	5.0	142,000
Sand (frozen, permafrost)	5.5	154,000
Sand (frozen, permafrost)	6.0	166,000
Sand (frozen, permafrost)	6.5	190,000
Sand (frozen, permafrost)	7.0	201,000
Sand (frozen, permafrost)	7.5	213,000
Sand (frozen, permafrost)	8.0	213,000
Sand (frozen, permafrost)	8.5	213,000
Sand (frozen, permafrost)	9.0	225,000
Sand (frozen, permafrost)	9.5	225,000
Sand (frozen, permafrost)	10.0	225,000

Notes: 1) Coefficient of subgrade reaction calculated for a 141 mm steel pipe pile.

It is essential that a good bond is developed between the pile and the frozen sand slurry; therefore, the steel piles below the design active layer thickness must be free of paint, lacquer, oil, grease and dirt.

To avoid group effect considerations, individual piles should be at least 3 pile diameters apart center to center. Further recommendations pertaining to consideration of group effect can be provided upon request if closer pile spacing is required.

The piles should be installed in pre-drilled oversize holes at least 50 mm larger than the pile diameter. The piles should be installed open ended in the hole and vibrated down to the design depth while adding low

saline sand (less than 5 ppt) and fresh water around the pile diameter. The interior of the piles should be filled with low saline sand to the final ground elevation to prevent air circulation inside the pile.

As noted above, seasonal groundwater flow through the active layer may be moderate; therefore, the use of casings may be required unless the pile installations can take place while the ground is completely frozen (November to May). Groundwater flow into adfreeze pile holes should be avoided as such water may delay freeze-back substantially.

The use of a suitable thickness of void form between the underside of the structure and the ground surface is recommended to avoid unwanted uplift due to heave.

10.0 Site Classification for Seismic Site Response

Based on the anticipated subsurface conditions, the areas can be classified as "Class C" for seismic site response in accordance with the requirements of Section 4.1.8.4 of the National Building Code of Canada (NBCC), 2015. In addition, the overburden soils are also considered to be non-liquefiable.

11.0 Requirement for Qualified Geotechnical Monitoring

As noted above, inspection and monitoring of foundation installations is an important component of the design process. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-surface conditions and site preparation activities. Qualified geotechnical personnel must assess the areas at some point during the design and construction process.

Section 4.2.2.3 of the NBCC states that *"a field review shall be carried out by the designer or by another suitably qualified person to ascertain that the subsurface conditions are consistent with the design and that construction is carried out in accordance with the design and good engineering practice. The review required by Sentence (1) shall be carried out on a continuous basis during the construction of all deep foundation units with all pertinent information recorded for each foundation unit."*

During rock socket pile installations, onsite geotechnical personnel shall monitor for bedrock depth/quality and observe grout mixing procedures closely, sampling the grout daily for UCS tests. During adfreeze pipe pile installations, onsite geotechnical personnel shall monitor backfilling procedures to ensure the socket is fully backfilled and install thermistor beads to monitor initial freeze back in accordance with this report.

12.0 Closure

The use of this report is subject to the attached statement of general conditions. It is the responsibility of the City of Iqaluit, who is identified as "the Client" within the statement of general conditions and its agents to review the conditions and to notify Adaptive Baseline Geotechnical Ltd. should any of these not be satisfied. The statement of general conditions addresses; use of the report, basis of the report, standard of care, interpretation of site conditions, varying or unexpected site conditions, planning, design and construction. We trust the information contained herein is adequate for your present purposes. Should you have any questions about the contents of this report, or if we can be of any further assistance, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

Adaptive Baseline Geotechnical Ltd.

PERMIT TO PRACTICE
ADAPTIVE BASELINE
GEOTECHNICAL LTD.
Signature _____
Date 4-Nov-2022
PERMIT NUMBER: P 1501
NT/NU Association of Professional
Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.A. SMITH
LICENSEE
NWT/NU

Sean M. Dillon, P.Eng. (NT/NU)
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Senior Geotechnical & Permafrost Engineer
jsmith@adaptivegeotechnical.com

ATTACHMENTS



Photograph 1 – October 3, 2022



Photograph 2 – October 3, 2022



Photograph 3 – October 3, 2022



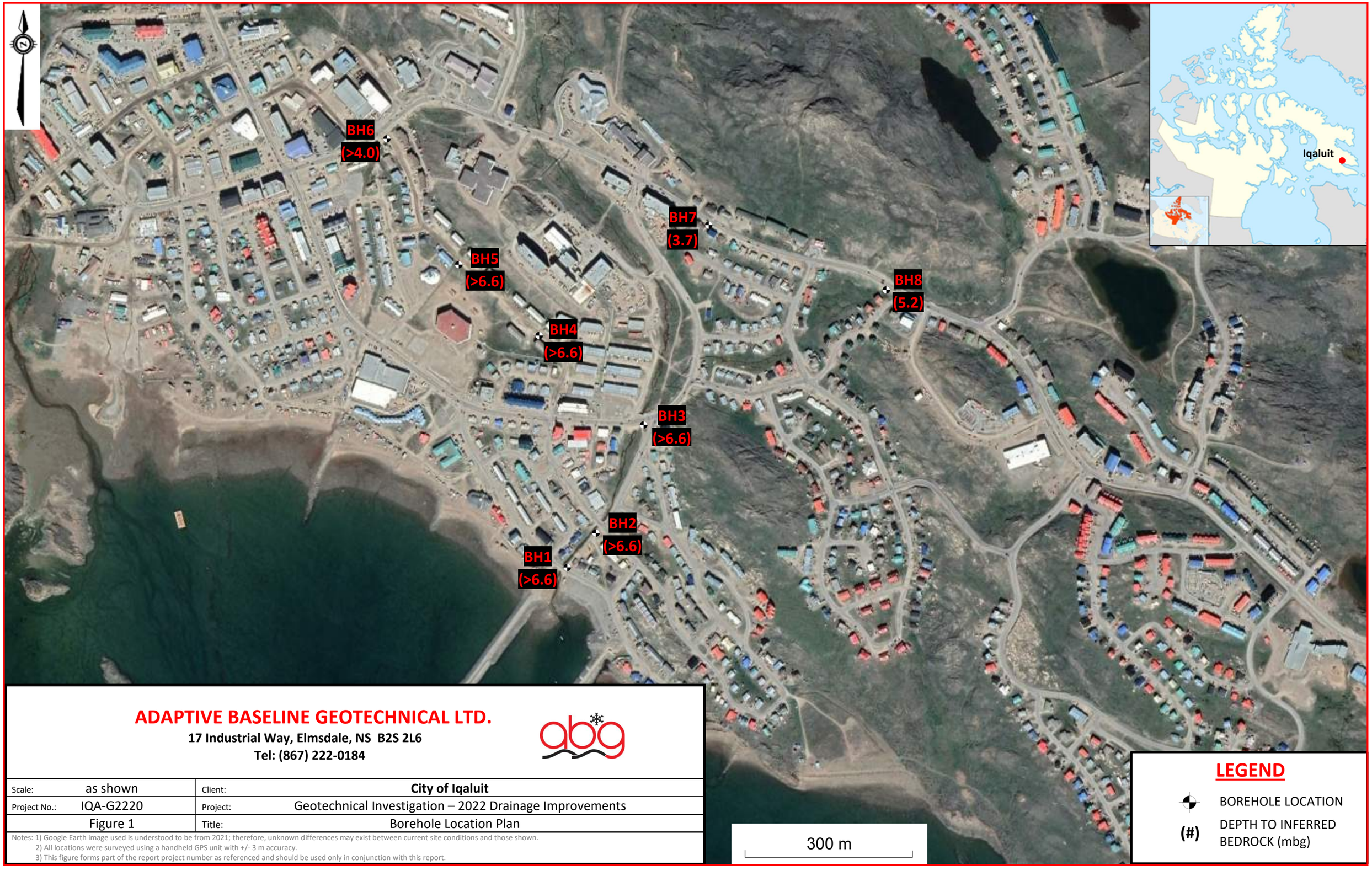
Photograph 4 – October 3, 2022



Photograph 5 – October 4, 2022



Photograph 6 – October 4, 2022



ADAPTIVE BASELINE GEOTECHNICAL LTD.

17 Industrial Way, Elmsdale, NS B2S 2L6

Tel: (867) 222-0184

Scale:	as shown	Client:	**City of Iqaluit**
Project No.:	IQA-G2220	Project:	Geotechnical Investigation – 2022 Drainage Improvements
	Figure 1	Title:	Borehole Location Plan

Notes: 1) Google Earth image used is understood to be from 2021; therefore, unknown differences may exist between current site conditions and those shown.
2) All locations were surveyed using a handheld GPS unit with +/- 3 m accuracy.
3) This figure forms part of the report project number as referenced and should be used only in conjunction with this report.

LEGEND

BOREHOLE LOCATION

(#) DEPTH TO INFERRED BEDROCK (mbg)

Adaptive Baseline Geotechnical
17 Industrial Way
Elmsdale, NS B2S 2L6
Telephone: 867.222.0184

BOREHOLE LOG

BH01

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.03 **COMPLETED** 2022.10.03
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 524129 m E 7068423 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0.40	Light brown well-graded SAND with silt and gravel		SW-SM		S1	0	37	57	6	8.3	
1	Light brown poorly-graded SAND with silt and gravel		SP-SM								
2					S2	0	30	65	5	10.5	
3					S3	0	30	63	7	11.2	
4											
5				Nbn	S4	0	27	66	7	9.4	
6											
6.60				Nbn	S5	0	30	63	7	9.3	
7	Borehole Terminated at 6.6 m - Target Depth										
8											
9											
10											
11											
12											
13											

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
☐FINES (%)☐
20 40 60 80

Adaptive Baseline Geotechnical
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Elmsdale, NS B2S 2L6
Telephone: 867.222.0184

BOREHOLE LOG

BH02

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.03 **COMPLETED** 2022.10.03
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 5244188 m E 7068489 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown poorly-graded SAND with silt and gravel		SW-SM		S1	0	21	73	6	5.5	
1.90	Light brown well-graded SAND with gravel		SW		S2	0	43	53	4	5.7	
3.90	Light brown poorly-graded SAND with silt and gravel		SW-SM	Nbe	S3	0	29	66	5	10.3	
				Nbn	S4	0	31	60	9	6.7	
6.60	Borehole Terminated at 6.6 m - Target Depth										

▲SPT N VALUE▲ 20 40 60 80
PL MC LL 20 40 60 80
☐FINES (%)☐ 20 40 60 80

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BOREHOLE LOG

BH03

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.03 **COMPLETED** 2022.10.03
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 524281 m E 7068694 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown poorly-graded SAND with silt and gravel		SP-SM		S1	5	29	63	8	3.8	
1.90	Light brown well-graded SAND with silt and gravel		SW-SM		S2	4	23	68	9	4.9	
3.40	Light brown silty SAND with gravel to silty SAND		SM	Nbn	S3	9	19	66	15	8.0	
				Nbn	S4	5	8	77	15	7.6	
6.40											
6.60	Light brown poorly-graded SAND with silt		SP-SM	Nbn	S5	2.5	12	78	10	7.5	
	Borehole Terminated at 6.6 m - Target Depth										

▲SPT N VALUE▲ 20 40 60 80
PL MC LL 20 40 60 80
☐FINES (%)☐ 20 40 60 80

Adaptive Baseline Geotechnical
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Elmsdale, NS B2S 2L6
Telephone: 867.222.0184

BOREHOLE LOG

BH04

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.03 **COMPLETED** 2022.10.03
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 524081 m E 7068868 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown poorly-graded SAND with silt and gravel		SP-SM		S1	12	31	57	12	5	
1.90	Light brown well-graded SAND with gravel		SW		S2	10	31	64	5	9.5	
3.40	Light brown silty SAND with gravel to silty SAND		SM	Nbn	S3	4	19	62	19	8.5	
				Nbe	S4	10	16	64	20	10.1	
6.60				Nbe	S5	7.5	10	69	21	10.9	
	Borehole Terminated at 6.6 m - Target Depth										

▲SPT N VALUE▲ 20 40 60 80
PL MC LL 20 40 60 80
☐FINES (%)☐ 20 40 60 80

Adaptive Baseline Geotechnical
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Telephone: 867.222.0184

BOREHOLE LOG

BH05

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.04 **COMPLETED** 2022.10.04
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 523928 m E 7069008 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown poorly-graded SAND with gravel		SP		S1	9	36	61	3	5.6	
1.90	Light brown silty SAND with gravel to silty SAND		SM		S2	5	17	71	12	7.9	
				Nbn	S3	6	11	77	12	9.5	
6.60				Nbn	S4	6	12	68	20	8.6	
	Borehole Terminated at 6.6 m - Target Depth										

▲SPT N VALUE▲ 20 40 60 80
PL MC LL 20 40 60 80
☐FINES (%)☐ 20 40 60 80

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Elmsdale, NS B2S 2L6
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BOREHOLE LOG

BH06

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.04 **COMPLETED** 2022.10.04
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 523791 m E 7069247 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown well-graded SAND with silt		SW-SM		S1	4	7	84	9	6.5	
1.90	Light brown poorly-graded SAND with gravel		SP		S1	0	25	71	4	8.9	
3.40	Light brown well-graded SAND with silt and gravel		SW-SM	Nbn	S1	0	16	77	7	9.3	
4.00	Borehole Terminated at 4 m - Target Depth										

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
☐ FINES (%) ☐ 20 40 60 80

Adaptive Baseline Geotechnical
17 Industrial Way
Elmsdale, NS B2S 2L6
Telephone: 867.222.0184

BOREHOLE LOG

BH07

CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.04 **COMPLETED** 2022.10.04
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 524407 m E 7069075 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown well-graded SAND with silt and gravel		SW-SM		S1	3.5	35	59	6	3.9	
1.90	Light brown poorly-graded SAND with gravel		SP		S2	3.0	20	76	4	6.1	
3.40	Light brown well-graded SAND with silt and gravel		SW-SM	Nbn	S3	5.5	18	76	6	4.2	
3.70	Inferred BEDROCK										
5.00	Borehole Terminated at 5 m - Target Depth										

▲SPT N VALUE▲ 20 40 60 80
PL MC LL 20 40 60 80
☐FINES (%)☐ 20 40 60 80

Adaptive Baseline Geotechnical
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Elmsdale, NS B2S 2L6
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BOREHOLE LOG

BH08

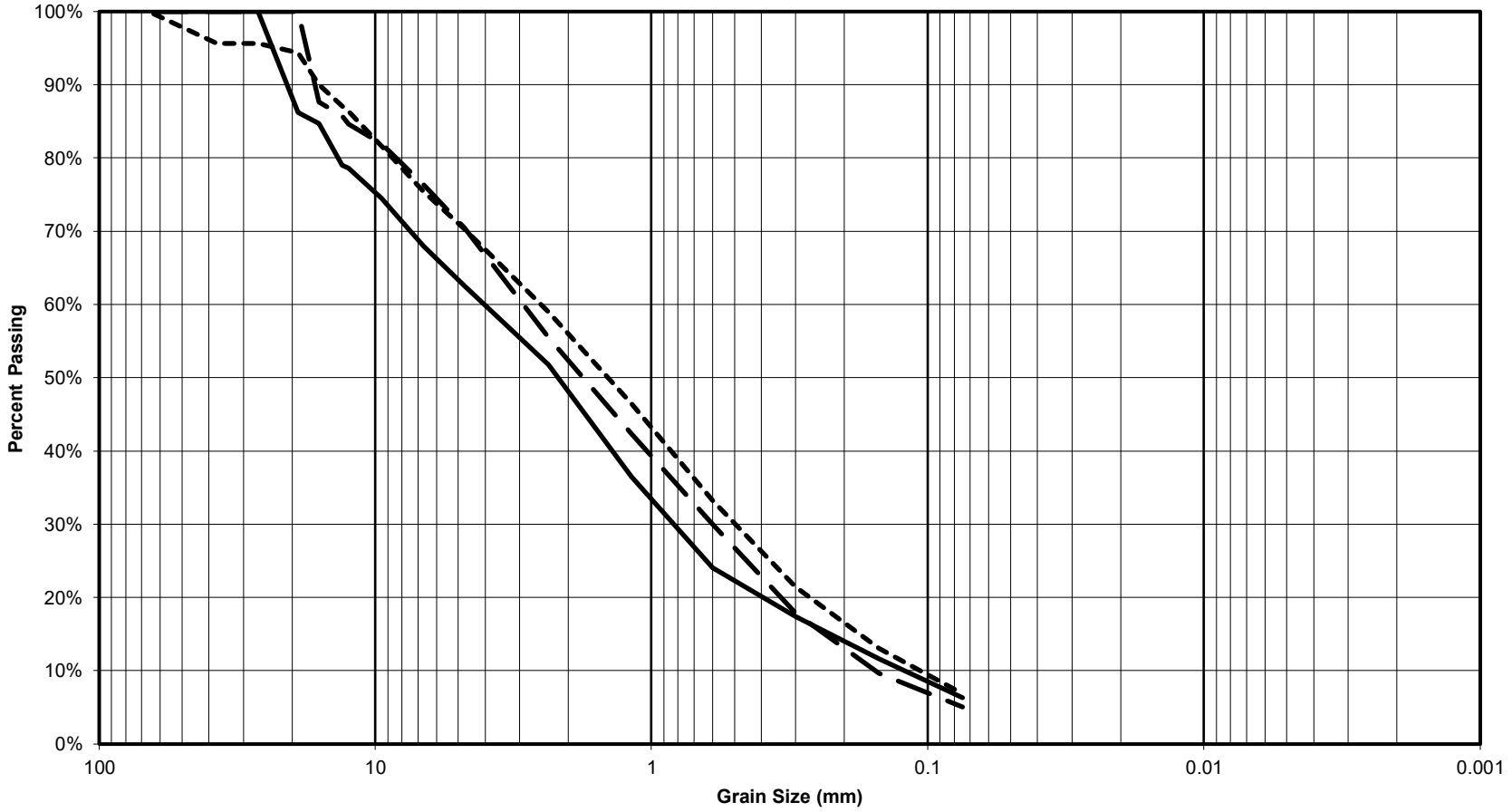
CLIENT City of Iqaluit
PROJECT NAME 2022 Drainage Improvements
PROJECT NUMBER IQA-G2220
PROJECT LOCATION Iqaluit, NU
DATE STARTED 2022.10.04 **COMPLETED** 2022.10.04
GROUND ELEVATION n/a **HOLE SIZE** 165.1 mm
DRILLING CONTRACTOR Canadrill Ltd.
NOTES UTM: 19V 524749 m E 7068947 m N
DRILLING METHOD Air Rotary
LOGGED BY LB **CHECKED BY** SMD

DEPTH (m)	MATERIAL DESCRIPTION	GRAPHIC LOG	USCS	GROUND ICE DESCRIPTION	SAMPLE NUMBER	SALINITY (ppt)	SOIL FRACTION (%) GRAVEL	SAND	FINES	MOISTURE CONTENT (%)	RQD (%)
0	Light brown well-graded SAND with gravel		SW		S1	4	28	68	4	4.9	
2					S2	5	43	53	4	3.8	
4				Nbn	S3	0	43	53	4	3.2	
4.90											
5.20	Light brown poorly-graded SAND with gravel		SP	Nbn	S4	0	34	63	3	5.8	
	Inferred BEDROCK										
6.60											
7	Borehole Terminated at 6.6 m - Target Depth										

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
☐FINES (%)☐
20 40 60 80

Grain Size Analysis

Project: IQA-G2220



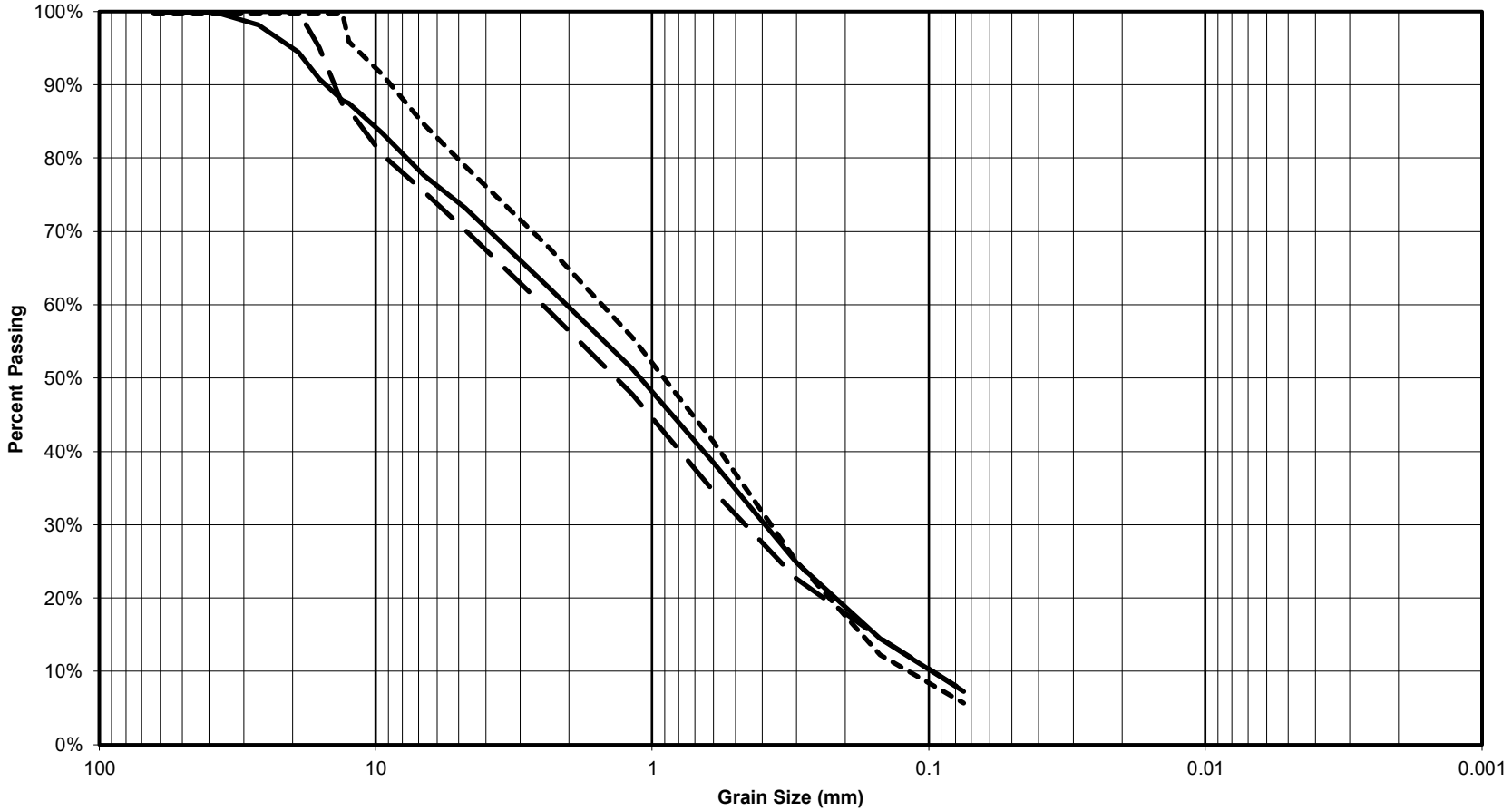
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH01	S1	0.3	37%	57%	6%	8.3%	Well-graded SAND with silt and gravel
— —	BH01	S2	1.5	30%	65%	5%	10.5%	Poorly graded SAND with silt and gravel
- - - -	BH01	S3	3.0	30%	63%	7%	11.2%	Poorly graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



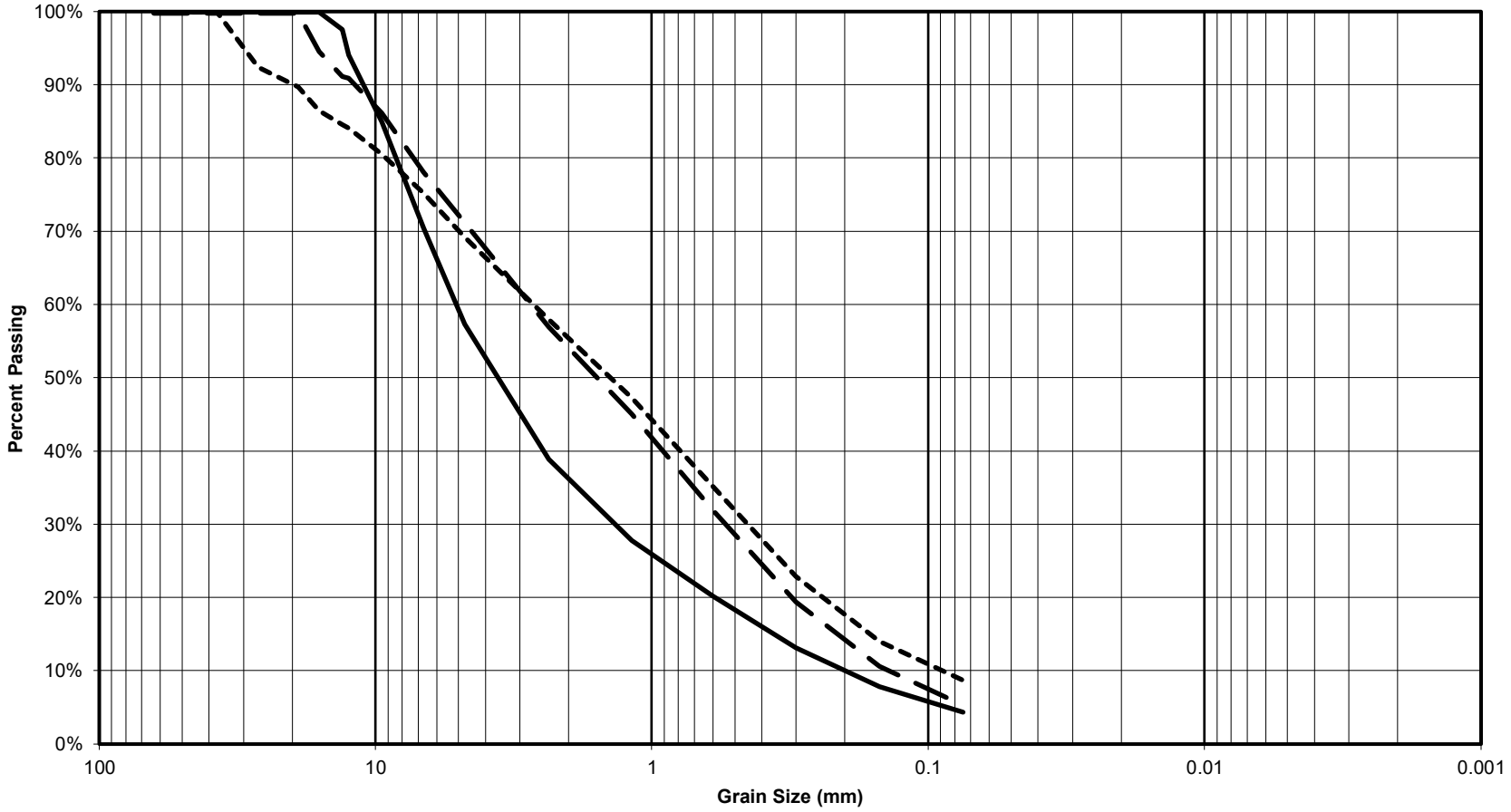
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH01	S4	5.0	27%	66%	7%	9.4%	Poorly graded SAND with silt and gravel
— —	BH01	S5	6.5	30%	63%	7%	9.3%	Poorly graded SAND with silt and gravel
- - - -	BH02	S1	0.5	21%	73%	6%	5.5%	Poorly graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



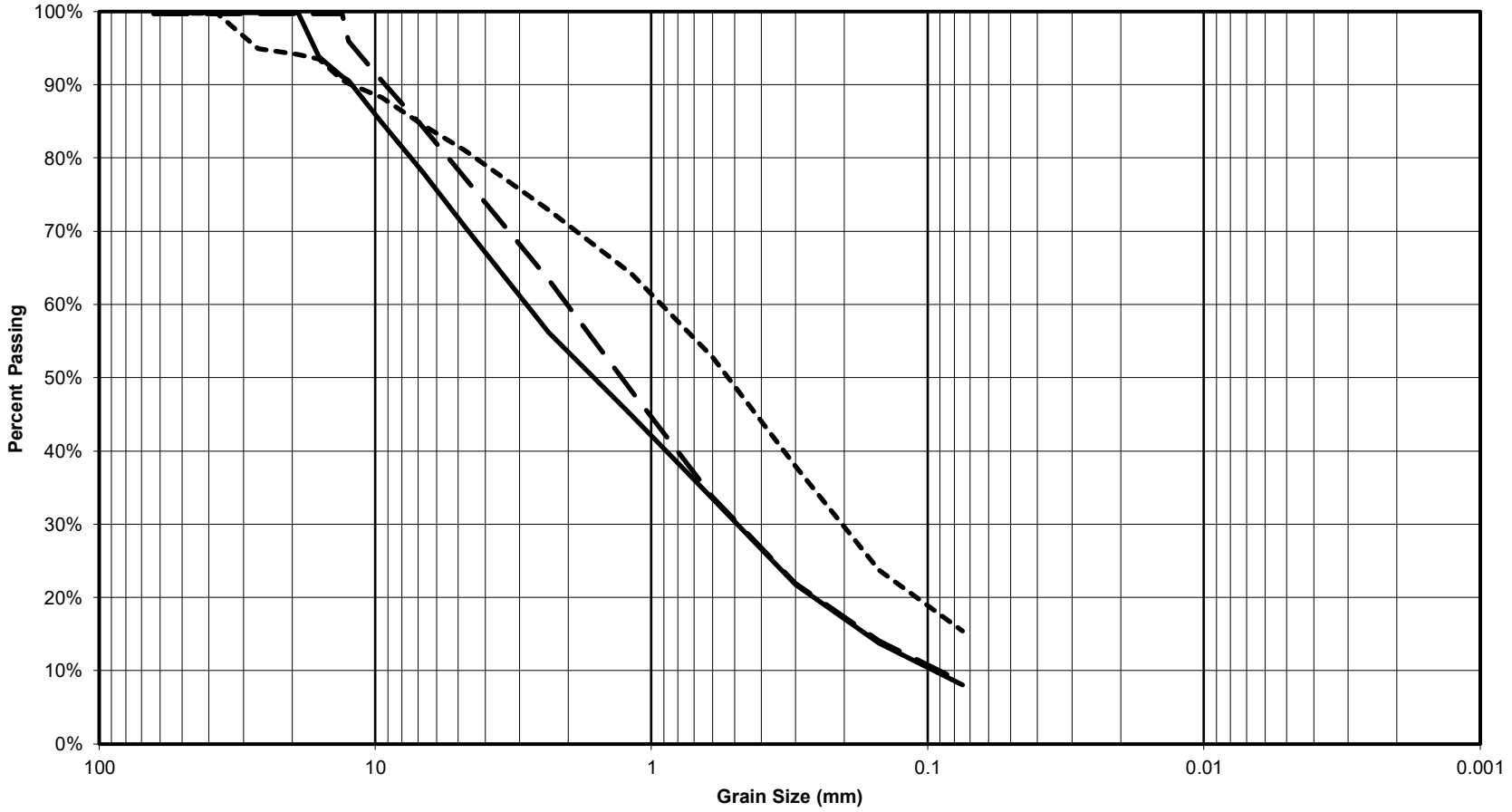
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH02	S2	2.0	43%	53%	4%	5.7%	Well-graded SAND with gravel
— —	BH02	S3	4.0	29%	66%	5%	10.3%	Poorly graded SAND with silt and gravel
- - - -	BH02	S4	6.0	31%	60%	9%	6.7%	Poorly graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



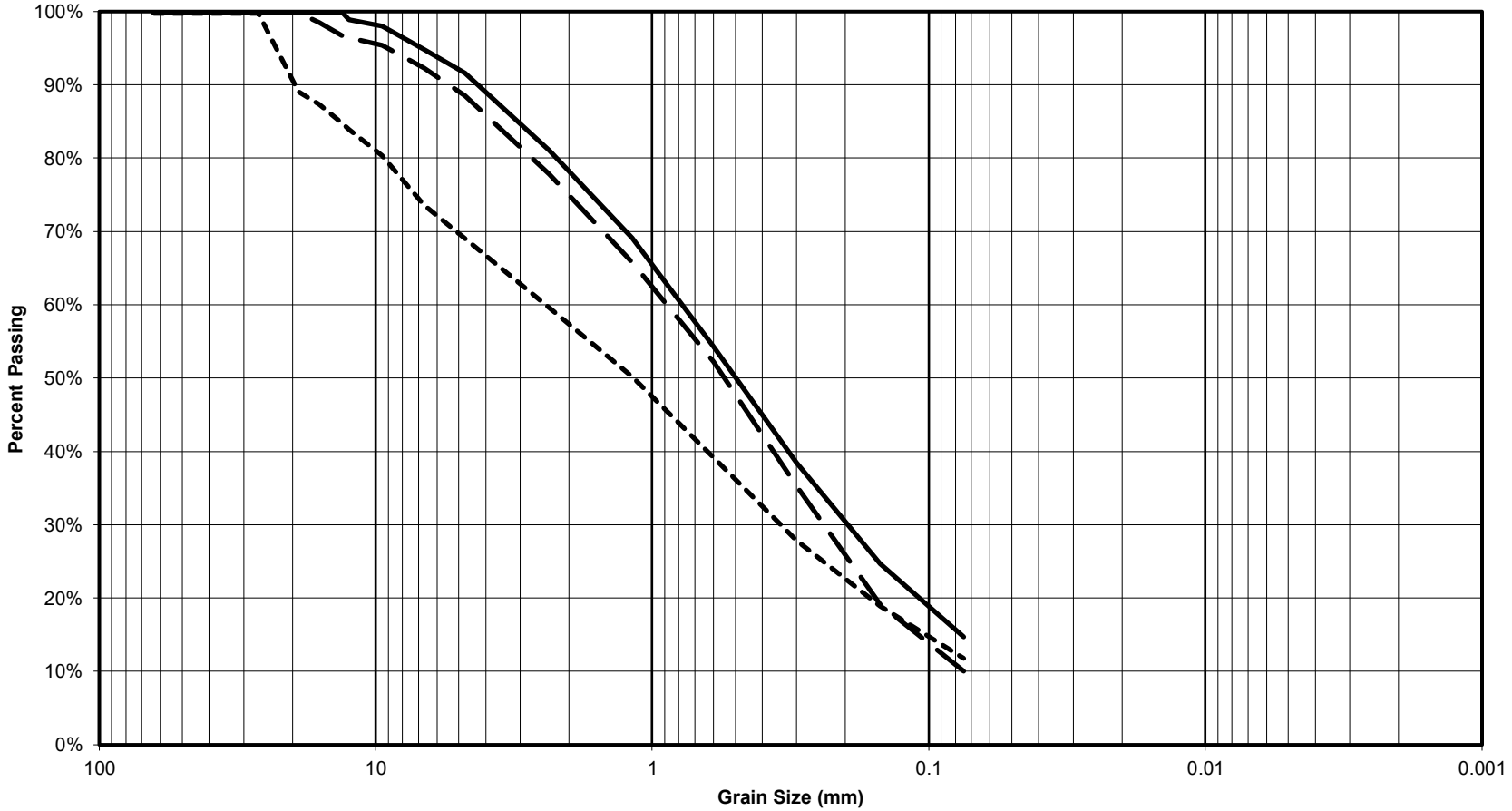
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH03	S1	0.5	29%	63%	8%	3.8%	Poorly graded SAND with silt and gravel
— —	BH03	S2	2.0	23%	68%	9%	4.9%	Well-graded SAND with silt and gravel
- - - -	BH03	S3	3.5	19%	66%	15%	8.0%	Silty SAND with gravel

Grain Size Analysis

Project: IQA-G2220



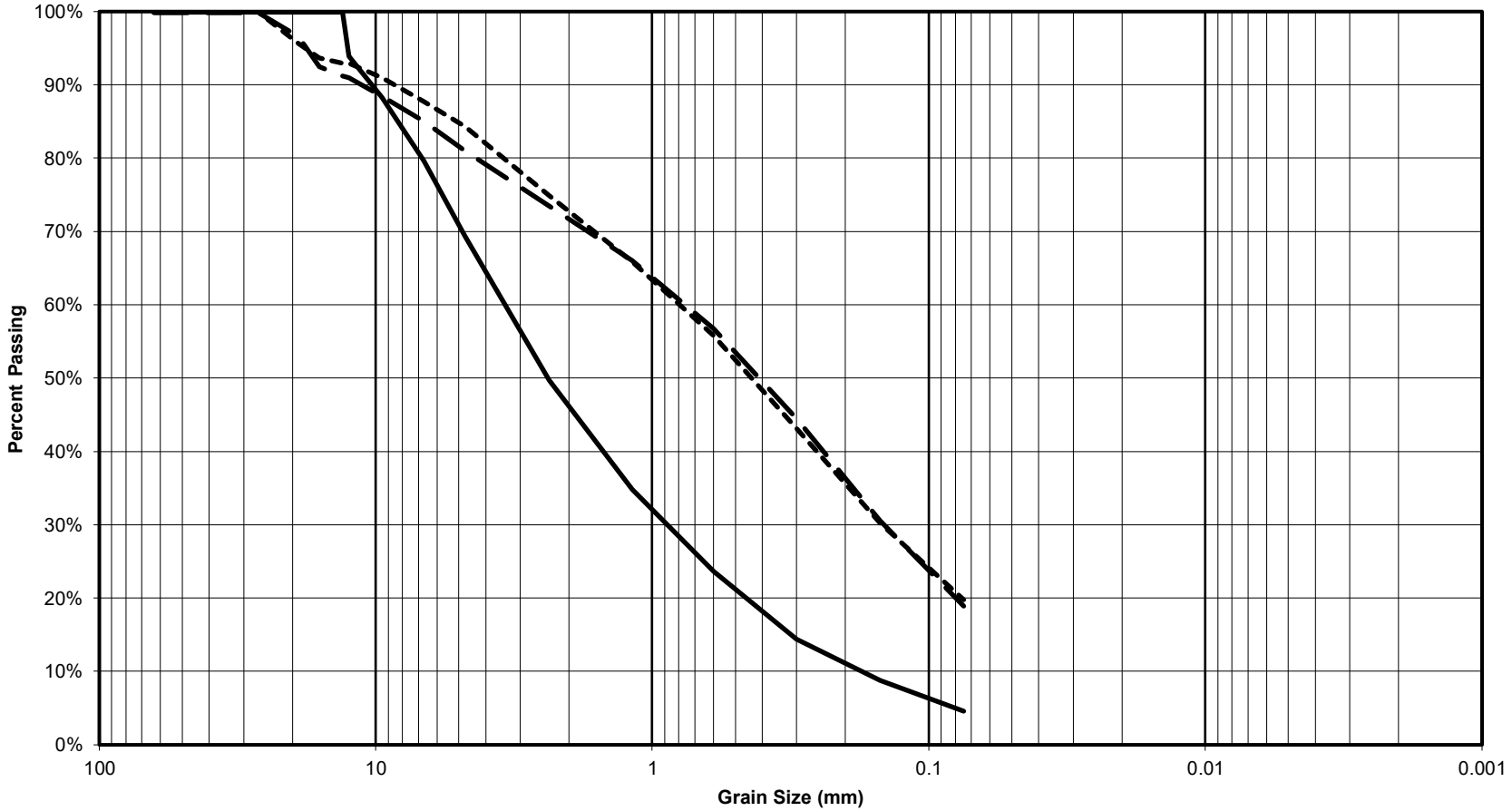
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH03	S4	5.0	8%	77%	15%	7.6%	Silty SAND
— —	BH03	S5	6.5	12%	78%	10%	7.5%	Poorly graded SAND with silt
- - - -	BH04	S1	0.5	31%	57%	12%	5.0%	Poorly graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



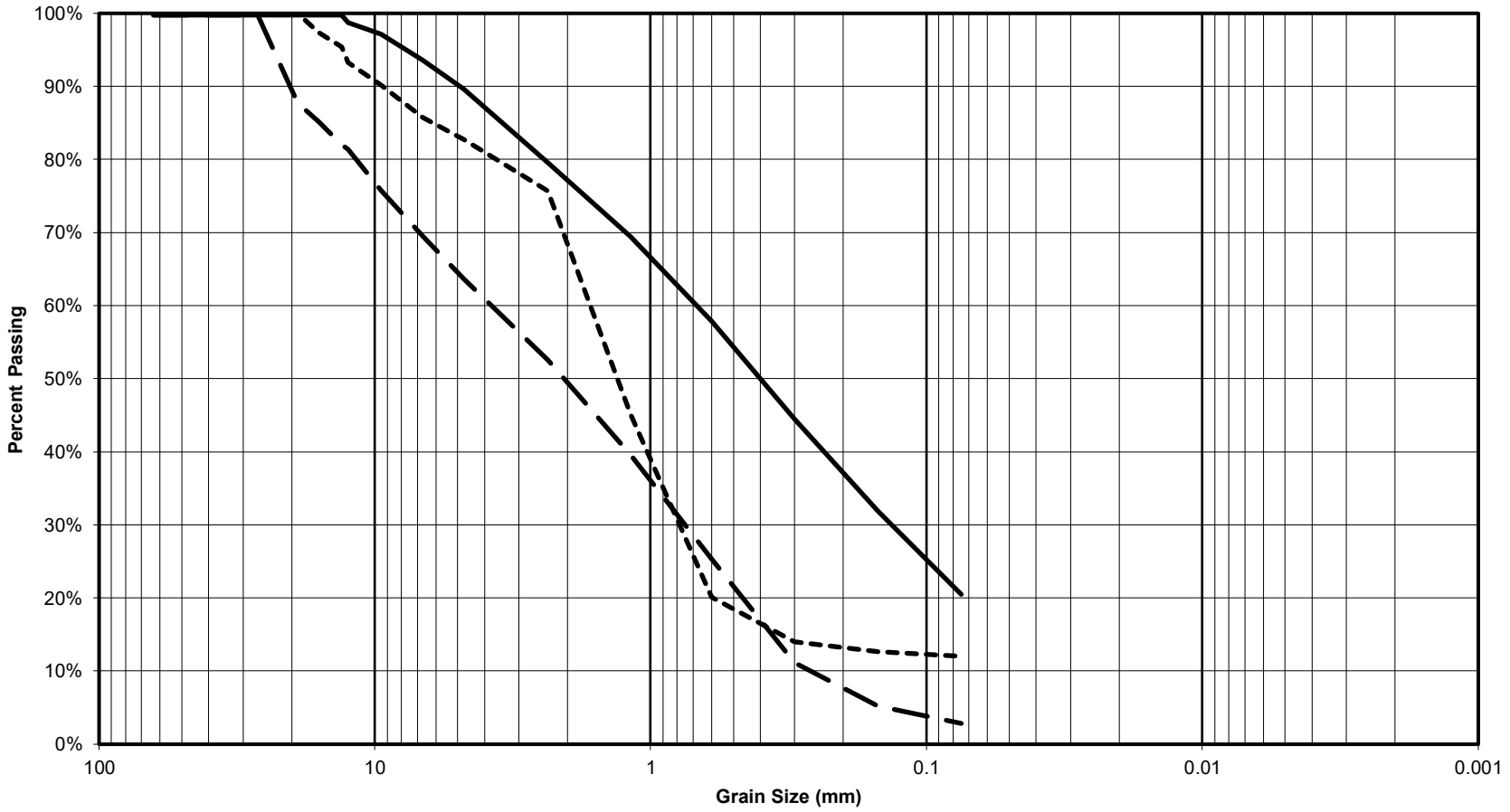
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH04	S2	2.0	31%	64%	5%	9.5%	Well-graded SAND with gravel
— —	BH04	S3	3.5	19%	62%	19%	8.5%	Silty SAND with gravel
- - - -	BH04	S4	5.0	16%	64%	20%	10.1%	Silty SAND with gravel

Grain Size Analysis

Project: IQA-G2220



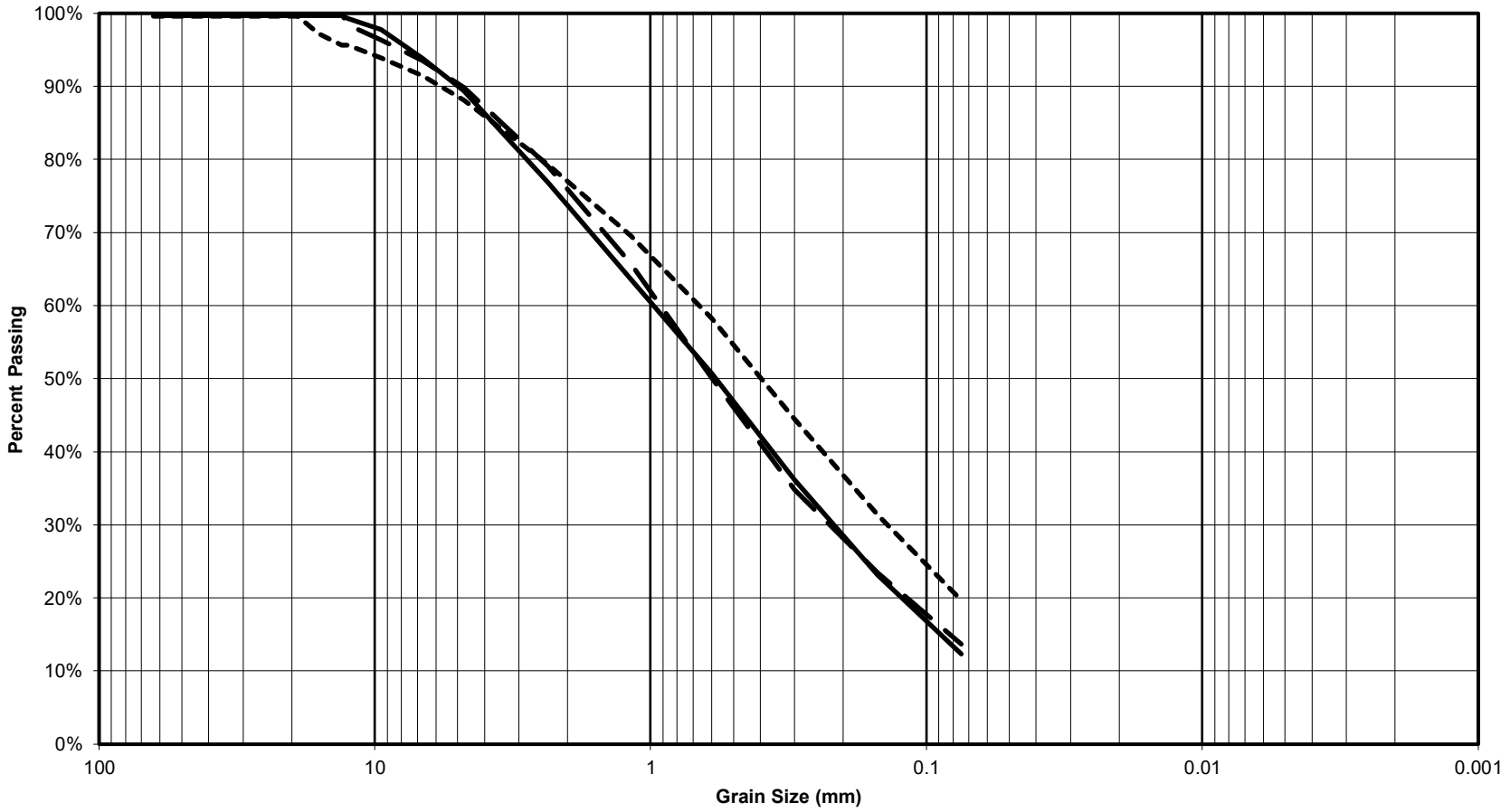
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH04	S5	6.5	10%	69%	21%	10.9%	Silty SAND
— —	BH05	S1	0.5	36%	61%	3%	5.6%	Poorly graded SAND with gravel
- - - -	BH05	S2	2.0	17%	71%	12%	7.9%	Silty SAND with gravel

Grain Size Analysis

Project: IQA-G2220



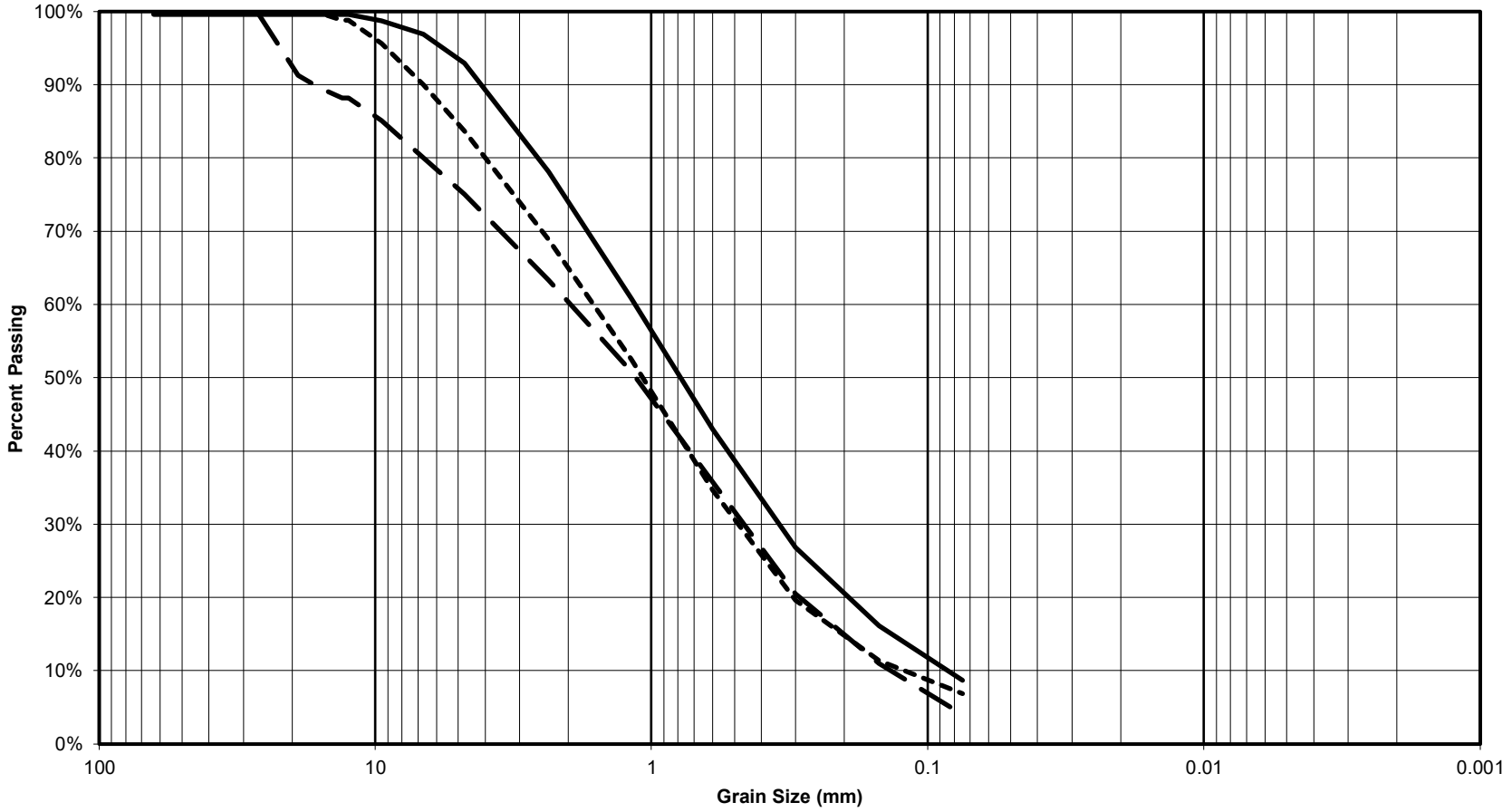
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH05	S3	3.5	11%	77%	12%	9.5%	Silty SAND
— —	BH05	S4	5.0	10%	76%	14%	9.6%	Silty SAND
- - - -	BH05	S5	6.5	12%	68%	20%	8.6%	Silty SAND

Grain Size Analysis

Project: IQA-G2220



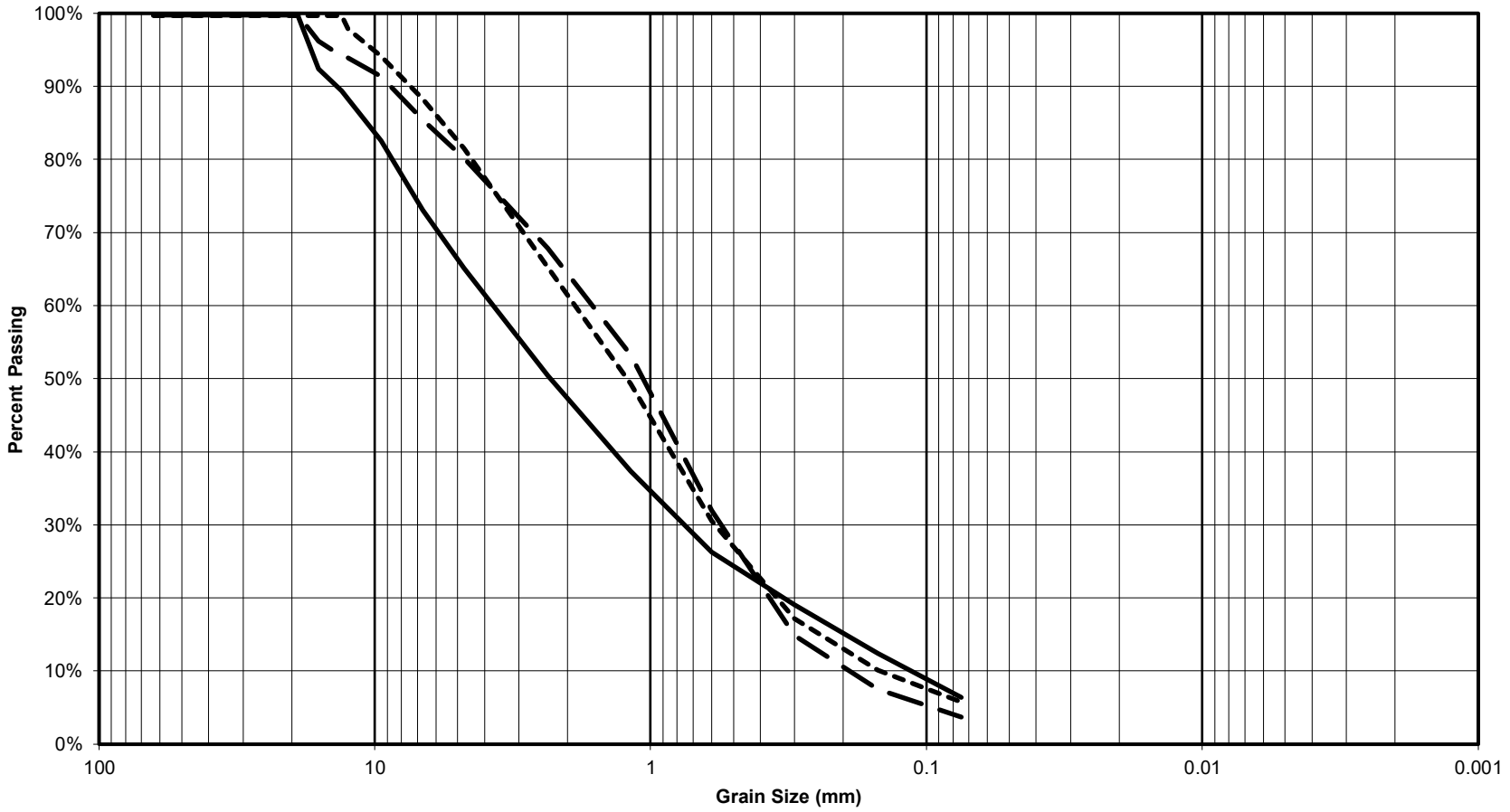
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH06	S1	0.5	7%	84%	9%	6.5%	Well-graded SAND with silt
— —	BH06	S2	2.0	25%	71%	4%	8.9%	Poorly graded SAND with gravel
- - - -	BH06	S3	3.5	16%	77%	7%	9.3%	Well-graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



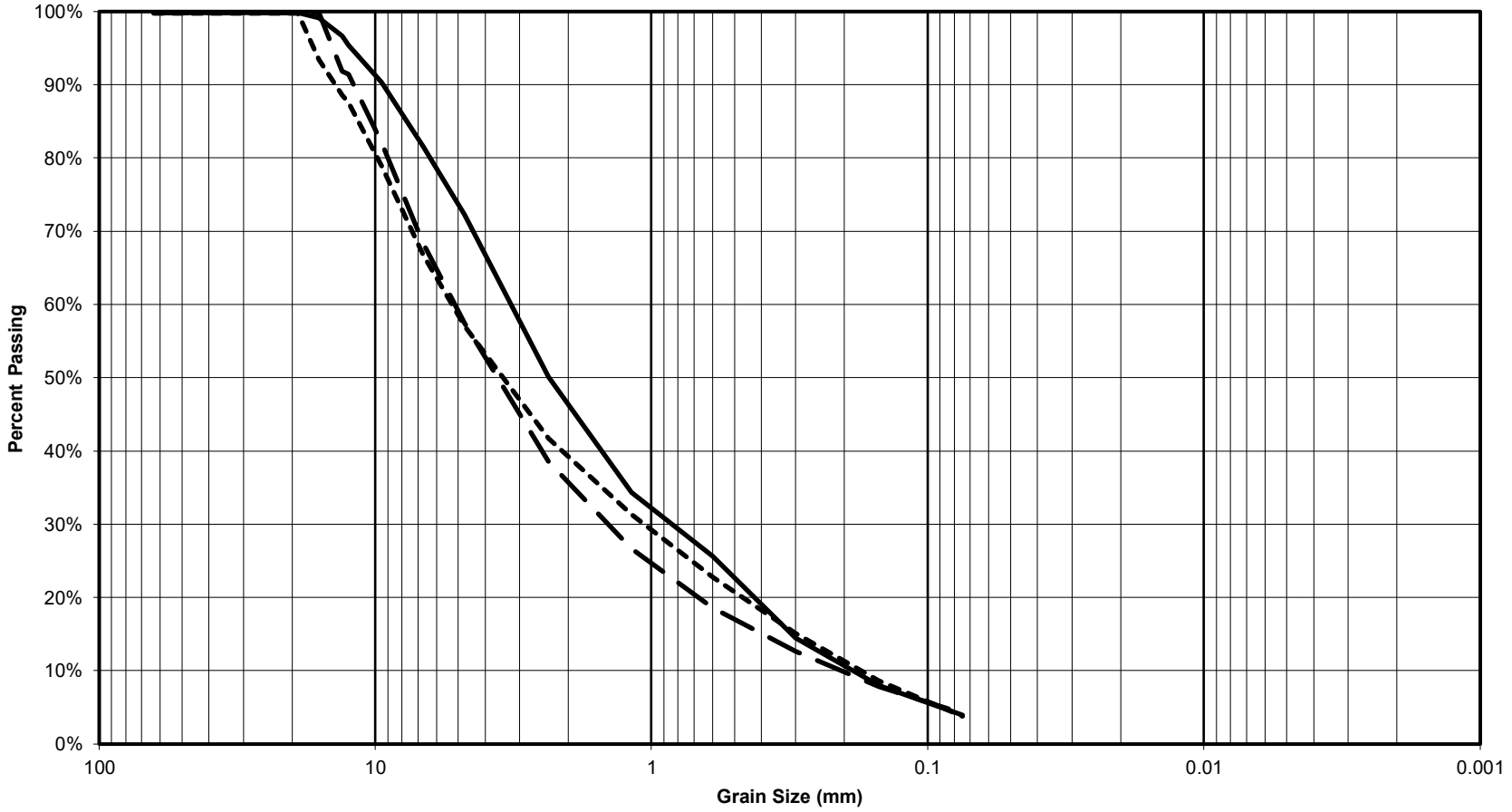
Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH07	S1	0.5	35%	59%	6%	3.9%	Well-graded SAND with silt and gravel
— —	BH07	S2	2.0	20%	76%	4%	6.1%	Poorly graded SAND with gravel
- - - -	BH07	S3	3.5	18%	76%	6%	4.2%	Well-graded SAND with silt and gravel

Grain Size Analysis

Project: IQA-G2220



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
———	BH08	S1	0.5	28%	68%	4%	4.9%	Well-graded SAND with gravel
— —	BH08	S2	2.0	43%	53%	4%	3.8%	Well-graded SAND with gravel
- - - -	BH08	S3	3.5	43%	53%	4%	3.2%	Well-graded SAND with gravel

Grain Size Analysis

Project: IQA-G2220



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Unified Soil Classification System ASTM D 2487/2488

Curve	Borehole/Testpit	Sample	Depth (mbg)	Soil Fractions			Moisture Content	Soil Description
				Gravel	Sand	Silt/Clay		
——	BH08	S4	5.0	34%	63%	3%	5.8%	Poorly graded SAND with gravel

STATEMENT OF GENERAL CONDITIONS

Use of this Report: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Adaptive Baseline Geotechnical Limited (ABG Ltd.) and the Client. Any use which a third party makes of this report is the responsibility of such third party.

Basis of the Report: The information, opinions, and/or recommendations made in this report are in accordance with ABG Ltd.'s present understanding of the site-specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site-specific project differs or is modified from what is described in this report, or if the site conditions are altered, this report is no longer valid unless ABG Ltd. is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

Standard of Care: Preparation of this report and all associated work was carried out in accordance with the normally accepted standard of care in the province or territory of execution for the specific professional service provided to the Client. No other warranty is made.

Interpretation of Site Conditions: Where ABG Ltd. has carried out a test pit or borehole field program, the soil, rock or other material descriptions and statements regarding their condition made in this report are based on site conditions encountered by ABG Ltd. at the time of the work and at the specified testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgement in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in-situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity and site use. In the case of a desktop assessment the previous reports and information prepared by other parties has been taken at face value.

Varying or Unexpected Conditions: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, ABG Ltd. must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. ABG Ltd. will not be responsible to any party for damages incurred as a result of failing to notify us that differing site or sub-surface conditions are present upon becoming aware of such conditions.

Planning, Design or Construction: Development or design plans and specifications should be reviewed by ABG Ltd. sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.) to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-surface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; ABG Ltd. cannot be responsible for site work carried out without being present.

NUNAVUT WATER BOARD

TYPE "A" WATER LICENCE NO. 3AM-IQA1626

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Licence No. 3AM-IQA1626

Pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to the

CITY OF IQALUIT

(Licensee)

P.O. BOX 460 IQALUIT, NU X0A OHO

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use Water or deposit Waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number / Type:	**3AM-IQA1626 / TYPE "A"**
Water Management Area:	**FROBISHER BAY WATERSHED (53)**
Location:	**WITHIN CITY OF IQALUIT'S MUNICIPAL BOUNDARIES, QIKIQTANI REGION, NUNAVUT**
Classification:	**MUNICIPAL UNDERTAKING**
Purpose:	**USE OF WATERS AND DEPOSIT OF WASTE**
Quantity of Water not to be Exceeded:	**1,100,000 CUBIC METRES ANNUALLY**
Date Licence Issuance:	**JUNE 17, 2016**
Expiry of Licence:	**JUNE 16, 2026**

This Licence issued **(Motion Number: 2016-02-P6-14)** and recorded at Goji Haven, Nunavut, includes and is subject to the annexed conditions.

Norman Mike
Nunavut Water Board,
Hearing Chair

APPROVED BY: Minister of Indigenous and Northern Affairs Canada

APPROVAL DATE:

PART A: **SCOPE, DEFINITIONS, AND ENFORCEMENT**

1. SCOPE

a. This Type "A" Water Licence No. 3AM-IQA1626 ("Replacement and Amended Licence" or "Licence") authorizes the City of Iqaluit ("Licensee" or the "City") to use Water and deposit Waste in support of a Municipal undertaking, as classified under Schedule 1 of the *Regulations*, within the City's municipal boundaries at the following approximate geographic coordinates:

Undertaking	Latitude	Longitude
Overall Extents	63° 50' 56.31" N	68° 39' 49.87" W
	63° 50' 57.30" N	68° 33' 41.94" W
	63° 43' 48.91" N	68° 18' 12.53" W
	63° 41' 06.60" N	68° 18' 18.82" W
	63° 41' 04.08" N	68° 32' 44.20" W
	63° 44' 46.02" N	68° 39' 43.1 0" W
West 40 Landfill	63° 43' 58.15" N	68° 32' 08.54" W
Water Treatment Plant	63° 45' 12.24" N	68° 30' 22.79" W
Wastewater Treatment Plant	63° 44' 45.15" N	68° 32' 19.80" W

The scope of activities, works, and undertakings authorized in accordance with the terms and conditions of this Replacement and Amended Licence is as follows:

a. Use, management, and protection of the Lake Geraldine drainage basin;
b. Management and protection of Waters surrounding the West 40 Landfill site;
c. Management, collection, and monitoring of leachate from the West 40 Landfill site and adjacent Sludge Management Facility;
d. Management of improved drainage works at the West 40 Landfill site;
e. Management, operation, and eventual closure and reclamation of the current West 40 Landfill site and associated solid waste disposal facilities;
f. Upgrades, operation, maintenance, monitoring, and eventual closure and reclamation of a Wastewater Treatment Plant (WWTP);
g. Operation, maintenance, monitoring, and eventual closure and reclamation of a Sludge Management Facility;
h. Operation, maintenance, monitoring and eventual closure and reclamation of a Sewage Lagoon Facility;
i. Implementation of contingency measures for the Wastewater and Landfill management facilities; and
j. Implementation of changes to the monitoring requirements including frequency, parameters, and stations being monitored.

b. This Licence is issued subject to conditions contained herein with respect to the taking of Waters and the depositing of Waste of any type in any Waters or in any place under any

conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the Act, or other statutes imposing more stringent conditions relating to the quantity, type or manner under which any such Waste may be so deposited, this Licence shall be deemed to be subject to such requirements; and

c. Compliance with the terms and conditions of this Licence does not absolve the Licensee from the responsibility for compliance with all applicable legislation, guidelines, and directives.

2. DEFINITIONS

a. The Licensee shall refer to Schedule A for definitions of terms used in this Licence.

3. ENFORCEMENT

a. Failure to comply with this Licence shall be a violation of the Act, subjecting the Licensee to the enforcement measures and the penalties provided for in the Act.

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the Act.

c. For the purpose of enforcing the terms and conditions of this Licence with respect to the use of Water and deposit or Discharge of Waste in Waters, Inspectors appointed under the Act, hold all powers, privileges, and protections that are conferred upon them by the Act or by other applicable laws.

PART B: GENERAL CONDITIONS

1. The Licensee shall file, with the Board for review, no later than the 31st of March of the year following the calendar year being reported, an Annual Report formulated in accordance with the requirements under Schedule B of this Licence.

2. The Licensee shall maintain a copy of this Licence at the Municipal Office, potable Water Treatment Facility, and the Waste Treatment Facilities at all times.

3. The Licensee shall file an application for renewal of this Licence at least one (1) year prior to the Licence expiry.

4. The Licensee shall, to the satisfaction of an Inspector, install, operate, and maintain metres, devices or other appropriate methods for measuring the volumes of Water used and Waste Discharged or deposited.

5. The Licensee shall post the necessary signs to identify the stations of the Monitoring Program included under Schedule I of this Licence. All signage shall be in the Official Languages of Nunavut.

6. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted cannot be undertaken without subsequent written approval and/or directions from the Board. The Board may alter or modify a Plan if necessary to achieve legislative objectives and will notify the Licensee in writing of acceptance, rejection, or alteration of the Plan.

7. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

8. The Licensee shall, within thirty (30) days of notification or within the timeframe specified by the Board, submit for review and/or Board's approval revisions for any plan found to be unacceptable to the Board.

9. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of the Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board shall also become part of the Licence. All relevant terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

10. The Licensee shall review the Plans referred to in this Licence as required by changes in operation and/or technology and modify the Plans accordingly. Revisions to any Plan shall be submitted in the form of an addendum to be included within the Annual Report required under Part B, Item 1, complete with the lists of revisions detailing where significant content changes are made.

11. The Licensee shall immediately report to the NWT/NU 24-Hour Spill Report Line (867-920-8130) any spills of Waste associated with the Undertakings under this Licence including the potable Water Treatment Facility and Waste Treatment Facilities, which are reported to or observed by the Licensee.

12. Any communication with respect to this Licence shall be made in writing to the attention of:

Manager of Licensing
Nunavut Water Board
P. O. Box 119
Goji Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca

13. Any notice made to an Inspector shall be made in writing to the attention of:

Water Resources Officer
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

14. The Licensee shall submit, to the Board for information or as otherwise directed, one (1) paper copy and one (1) electronic copy of all reports, studies, and Plans generated for the works, activities, and undertakings under this Licence. All Reports, studies or Plans submitted to the Board by the Licensee shall include an executive summary in English, Inuktitut, and French.

15. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received by the Board and maintain on file a copy of the acknowledgment of receipt issued by the Manager of Licensing or his/her designate.

16. This Licence is assignable as provided for in section 44 of the Act.

17. The expiry or cancellation of this Licence does not relieve the Licensee from any obligation imposed by the Licence, or any other regulatory requirement.

PART C: CONDITIONS APPLYING TO SECURITY

1. The Licensee is not required to post reclamation security for the activities, works, and undertakings authorized under this Licence.

PART D: CONDITIONS APPLYING TO THE USE OF WATERS AND WATER MANAGEMENT PLANS

1. The Licensee is authorized to withdraw, from the Lake Geraldine Reservoir at Monitoring Station No. IQA-01, up to 1,100,000 cubic metres of Water annually for the relevant activities, works, and undertakings authorized under the scope of this Licence.

2. The Licensee shall submit to the Board for approval, within sixty (60) days of the Effective Date of the Licence, an updated manual for the potable Water Treatment Facility. The Manual shall be prepared in accordance with relevant aspects of the format outlined in the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996). The manual shall, address among other items, the following:

    a. Purpose of facility;
    b. Site setting;

c. Operational procedures for storage, treatment and distribution of potable Water; Waste generated and hazardous substances associated with the facility; site inspections; and personnel training;
d. Maintenance procedures including equipment servicing;
e. Sampling and monitoring requirements; and
f. Emergency response measures.

3. The Licensee shall equip all freshwater intake structures with screens of appropriate mesh size that meet the requirements of Fisheries and Oceans (DFO) Canada's *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (1995 or the most current) so as to prevent the entrainment of fish and control Water withdrawal rates such that fish do not become impinged within the screens.

4. The Licensee shall undertake Dam Safety Inspections (DSI) and/or Dam Safety Reviews (DSR) of the Lake Geraldine water supply facility in accordance with requirements of the Canadian Dam Association (CDA), *Dam Safety Guidelines* (2007, or the most current version). The Licensee shall submit for the Board's review, within the Annual Report required under Part B, Item 1, the report generated for the DSIs or DSRs along with the Licensee's recommended actions to address any deficiencies identified in the inspections and/or reviews.

5. The Licensee shall not remove any material from below the ordinary High Water Mark of any Water body unless otherwise approved by the Board in writing.

6. The Licensee shall not cause erosion to the banks of any body of Water and shall provide the necessary controls to prevent such erosion.

7. The Licensee shall implement necessary measures to control sediment and erosion prior to and during operations to prevent entry of sediments into Water.

8. The Licensee shall maintain the potable Water Treatment Facility in accordance with applicable guidelines, procedures, and regulations and to the satisfaction of an Inspector.

9. The Licensee shall, as part of any proposal to supplement the Lake Geraldine Reservoir, evaluate the potential impact on freshwater resources, including fish and fish habitat. The results of the evaluation must be included as part of any application to augment the Lake Geraldine Reservoir with Water from proximal water bodies.

PART E: CONDITIONS APPLYING TO THE DEPOSIT OF WASTE AND WASTE MANAGEMENT PLANS

1. The Licensee is authorized to use the Sewage Lagoon Facility and the Wastewater Treatment Plant to treat and dispose of Wastewater generated by the Undertaking authorized under this Licence until such time that the Upgraded Wastewater Treatment Plant authorized by the

Licensee is constructed and commissioned, or as otherwise approved by the Board in writing.

2. The Licensee shall provide written notice to an Inspector and the Board at least ten (10) days prior to any planned Discharges from the Solid Waste Facility, Sewage Lagoon Facility, Wastewater Treatment Plant, and the Upgraded Wastewater Treatment Plant once commissioned.

3. The Licensee shall establish the relevant monitoring stations for the facilities authorized under this Licence in accordance with Schedule I.

4. The Licensee shall ensure that Surface Drainage or surface Water runoff associated with site activities or generated during the construction of any facility designed to withhold, divert, or retain Water or Waste, does not exceed the following Effluent criteria:

Parameter	Maximum Average Concentration	Maximum concentration of Any Grab Sample
Total Suspended Solids (TSS)	50.0 mg/L	100.0 mg/L
pH	Between 6 and 9.	

5. Upon commissioning of the Upgraded Wastewater Treatment Plant, the Sewage Lagoon Facility shall be used as a back-up facility or closed and reclaimed in accordance in Part J, Item 4.

6. The Licensee shall submit to the Board for approval in writing, within four (4) months of the Effective Date of the Licence, an Operation and Maintenance Manual for the Sewage Lagoon Facility that addresses requirements for both the Sewage Lagoon and Sludge Management Facilities. The manual shall be prepared in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996).

7. The Licence shall submit to the Board for approval in writing, by December 21, 2018 or as otherwise directed by the Board in writing, an Operations and Maintenance Manual for the Upgraded Wastewater Treatment Plant that incorporates the requirements of Part E, Item 6. The manual shall be prepared in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996).

8. The manual referred to in Part E, Item 7 shall supersede the manual referenced in Part E, Item 6, following approval by the Board in writing.

9. The Licensee shall submit to the Board for approval in writing, by December 31, 2018, an updated version of the plan entitled *City of Iqaluit Solid Waste Management Plan*, dated January 2014 that addresses relevant intervener's comments and recommendations made during the licensing process, such as inclusion of details related to future uses of the landfill, timeframe for closure, and ongoing activities within the scope of this Licence.

10. The Licensee shall undertake Dam Safety Inspections (DSI) and/or Dam Safety Reviews (DSR) of the Wastewater Treatment Facilities in accordance with requirements of the Canadian Dam Association (CDA), *Dam Safety Guidelines* (2007, or most current version). The Licensee shall submit for the Board's review, within the Annual Report required under Part B, Item 1, the report generated for the DSIs or DSRs along with the Licensee's recommended actions to address any deficiencies identified in the inspections and/or reviews.

11. The Licensee shall dispose of and contain all municipal solid waste generated by the City at the West 40 Landfill as associated site(s) authorized under this licence or as otherwise approved by the Board in writing.

12. The Licensee shall submit to the Board for approval, within sixty (60) days of the Effective Date of the Licence, an updated Landfill Operation and Maintenance Manual that addresses concerns raised by intervening parties during the licensing process including the following:

    a. Management of Leachate from the facility;
    b. Updated sampling and monitoring requirements; and
    c. Open burning practices.
    d. Ongoing activities within

13. The Licensee shall collect and contain all leachate generated by the West 40 Landfill within the Landfill.

14. The Licensee shall submit to the Board for review, by December 31, 2017, an updated version of the document entitled *West 40 Landfill Drainage Management Review*, dated September 16, 2011, that addresses the concerns raised by intervening parties including information on the absence of permafrost related data.

15. The Inspector may authorize an emergency Discharge ,following the Licensee's written submission to the Inspector and to the Board, at least fifteen (15) days prior to discharge or as instructed by the Inspector, that includes the following information:

    a. Proposed quantity of discharge;
    b. Reason for discharge;
    c. Identification of the Final Discharge Location;
    d. Proposed sampling and analysis to be conducted; and
    e. Proposed mitigation measures to implemented.

16. The Licensee shall submit to the Board and the Inspector for review, within sixty (60) days following any emergency Discharge authorized by the Inspector, a report that includes, among other items, an analysis of results for the emergency Discharge.

17. The Licensee shall maintain the Licensed Facilities to the satisfaction of an Inspector.

18. The Licensee shall remove from the site associated with the undertaking, all Hazardous Wastes, waste oil and non-combustible waste generated through the course of the operation, for disposal at a licensed waste disposal facility.

19. The Licensee shall maintain records of all Waste removed from site and records of confirmation of proper disposal of removed Waste. These records shall be made available to an Inspector or the Board upon request.

PART F: CONDITIONS APPLYING TO CONSTRUCTION

1. The Licensee shall, submit to the Board for review, within thirty (30) days prior to commencing construction of any facilities or infrastructure authorized under this Licence, for-construction designs and drawings, signed and stamped by an Engineer.

2. The Licensee shall ensure that all relevant approved facilities are designed and constructed to engineering standards such that, at a minimum, they comply with the most current version of the *Canadian Dam Safety Guidelines*.

3. The Licensee shall implement measures to ensure that all materials used in the construction of relevant facilities or infrastructure included under the scope of this Licence are free of contaminants, to the extent that they do not cause harmful or significant effects to Water.

4. The Licensee shall maintain shoreline stability during construction.

5. The Licensee shall ensure that all final designs and drawings are qualified by an Engineer confirming that:

    a. Works are designed under sound engineering principles;
    b. Design limitations are understood and communicated within the report; and
    c. Measures are implemented to minimize impact to Water.

6. The Licensee shall, submit to the Board for review, within ninety (90) days of completion of any structure authorized under this licence, to contain, withhold, divert or retain Water or Wastes; a construction summary report prepared by an Engineer that includes, among other relevant information, as-built drawings, documentation of field decisions that deviated from original plans, and any data used to support these decisions.

7. The Licensee shall, if contamination of surface and/or ground water is encountered during construction and excavation, notify the Inspector immediately and implement the Spill Contingency Plan.

8. The Licensee shall develop and implement measures necessary to prevent and mitigate erosion and/or the release of sediment into Water during the construction of the Upgraded Wastewater Treatment Plant or during any construction activities associated with the Undertaking.

PART G: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the potable Water Treatment Facility and Waste Treatment Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. Such Modifications are consistent with the NPC Land Use Planning (NPC) Conformity Determination and the NIRB Screening Decision;
    c. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    d. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    e. The Board has not rejected the proposed Modifications.

2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met can be carried out only with written approval from the Board.

3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modifications. These plans and drawings shall be stamped by an Engineer.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Licensee shall, submit to the Board for approval in writing, within thirty (30) days of the Effective Date of this Licence, an amalgamated and updated Spill Contingency Plan. The Plan shall address spill contingency planning requirements for all relevant aspects of works, activities, and undertakings associated with the scope of this Licence including the Sewage Lift Station.

2. The Licensee shall, subject to section 16 of the Regulations, report any unauthorized deposits of Waste or foreseeable unauthorized deposits of waste and/or Discharges of Effluent, and:

    a Employ, as required, the approved Spill Contingency Plan;
    b Report the incident immediately via the NWT/NU 24-Hour Spill Reporting Line (867) 920-8130 and to the Inspector at (867) 975-4295; and
    c For each spill occurrence, submit a detailed report to the Inspector, no later than thirty (30) days after initially reporting the event. The report shall include the amount and

type of spilled product, the GPS location of the spill, and the measures taken to contain, clean up and restore the spill site.

3. The Licensee shall, in addition to Part H, Item 2, regardless of the quantity of release of a harmful substance, report to the NWT/NU Spill Line if the release is near or into a Water body.

PART I: CONDITIONS APPLYING TO MONITORING

1. The Licensee shall monitor the relevant potable Water Treatment Facility and Waste Treatment Facilities authorized under this Licence in accordance with requirements included under Schedule I.

2. The Licensee shall, submit Board for approval in writing, within sixty (60) days of the Effective Date of this Licence, an updated Monitoring Program that addresses monitoring requirements for the Water Treatment Facility and Waste Treatment Facilities. The Monitoring Program shall address, among other items, the requirements outlined in Schedule I.

3. All analyses required under Schedule I shall be conducted using methods as described in the most recent edition of "*Standard Methods for the Examination of Water and Wastewater*", or by such other methods as approved by the Board in writing.

4. All laboratory analyses shall be performed at a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

5. The Licensee shall, submit to the Board for review, within sixty (60) days of the Effective Date of the Licence, an updated Quality Assurance/Quality Control (QA/QC) Plan prepared in accordance with *Quality Assurance (QA) and Quality Control (QC) Guidelines for Use by Class "A" Licensees in Meeting SNP Requirements and for Submission of a QA/QC Plan* (INAC, 1996 or most current version). The updated plan shall be accompanied by a letter from an Analyst of an accredited laboratory confirming acceptability of the Plan.

6. The Licensee shall measure by instrument and record in cubic metres, the monthly quantities of freshwater extracted from the Lake Geraldine Reservoir, at Monitoring Program Station No. IQA-01, used for all purposes under this Licence.

7. The Licensee shall measure, by instrument and record in cubic metres, the quantities of Effluent released from the Sewage Lagoon Facility at Monitoring Station No. IQA-02, Wastewater Treatment Plant and/or Upgraded Wastewater Treatment Plant at Monitoring Station No. IQA-04 and the West 40 Landfill at Monitoring Station No. IQA-08.

8. The Licensee shall measure and record in cubic metres, the monthly and annual volumes of sludge removed from the Wastewater Treatment Facilities.

9. The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations of sources of Water utilized and Waste deposited under this Licence.

10. The Licensee shall include all of the data and information required by the Monitoring Program under Schedule I within the Annual Report required under Part B, Item 1 of the Licence or as otherwise requested by an Inspector and/or the Board.

11. Additional Monitoring may be requested by the Board and/or the Inspector.

12. The Monitoring Program and compliance dates specified in the Licence may be modified at the discretion of the Board in writing and do not constitute an application for Amendment as defined in the *Act.*

PART J: CONDITIONS APPLYING TO CLOSURE AND RECLAMATION

1. The Board has accepted the document entitled *Iqaluit Solid Waste Management Plan West 40 Landfill Decommissioning Technical Memorandum*, dated January 2014, submitted as additional information with the Application.

2. The Licensee shall submit to the Board for approval in writing, at least one (1) year prior to commencing the decommissioning of the West 40 Landfill, a Final Closure and Reclamation Plan prepared by an Engineer in accordance with industry's best practices and relevant guidelines.

3. The Licensee shall, for the Plan required under Part J, Item 2, include a presentation of data and a discussion of environmental conditions existing before the use of the site by the Licensee as a municipal landfill, as well as remediation objectives.

4. The Licensee shall notify the Board in writing, at least one year prior to the implementation of final closure, of its intentions to proceed with final closure of any Water use or Waste disposal facilities included within the scope of this Licence, excluding the Facility under Part J, Item 2.

SCHEDULES

Schedule A: Scope, Definitions, and Enforcement
Schedule B: General Conditions
Schedule C: No Schedule for Security
Schedule D: No Schedule for Use of Water and Water Management Plans
Schedule E: No Schedule Waste Disposal and Waste Management Plans
Schedule F: No Schedule for Construction
Schedule G: No Schedule for Modifications
Schedule H: No Schedule for Spill Contingency Planning
Schedule I: Monitoring
Schedule J: No Schedule for Closure and Reclamation

Schedule A: Definitions

In this Licence, 3AM-IQA1626:

"**Act**" means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

"**Addendum**" means the supplemental text that is added to a full plan, manual, or report, usually included at the end of the document and is not intended to require a full resubmission of the revised report. It may also be considered as an appendix or supplement;

"**Amendment**" means a change to any terms and conditions of this Licence through application to the NWB, requiring a change, addition, or deletion of specific terms and conditions of the Licence not considered as a modification;

"**Analyst**" means an Analyst designated by the Minister under section 85 (1) of the *Act*;

"**Annually**" means, in the context of monitoring frequency, one sampling event occurring every 365 days with a minimum of 200 days between sampling events;

"**Application**" means, for the purposes of this License, the totality of the NWB Public Register opened as a result of the filing of the application to replace and amend expired Water Licence 3AM-IQA0611(3AM-IQA0612);

"**Biannually**" means, in the context of the monitoring frequency, two sampling events occurring per calendar year, with a minimum of 150 days and a maximum of 210 days between sampling events;

"**Board**" means the Nunavut Water Board established under Article 13 of the *Nunavut Land Claims Agreement* and under section 14 of the Act;

"**Discharge**" means the release of any Water or Waste to the receiving environment;

"**Effective Date**" means the date on which the Minister of Indigenous and Northern Affairs Canada approves the Licence;

"**Effluent**" means treated or untreated liquid Waste material that is Discharged into the environment from the site water management facilities such as a settling pond or a treatment plant;

"**Engineer**" means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2* and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

"**Engineered Structure**" means any facility, designed and approved by a Professional Engineer who is registered with the Association of Professional Engineers, Geologists and Geophysicists of Nunavut;

"**Grab Sample**" means an undiluted quantity of material collected at a particular time and place that may be representative of the total substance being sampled at the time and place it was collected;

"**Greywater**" means the component of Effluent produced from domestic use (i.e. washing, bathing, food preparation and laundering), excluding Sewage;

"**Hazardous Waste**" means materials or contaminants categorized as dangerous goods under the *Transportation of Dangerous Good Act* (1992), no longer used for their original purpose and intended for recycling, treatment, disposal or storage at appropriate facilities;

"**High Water Mark**" means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. *Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities*);

"**Inspector**" means an Inspector designated by the Minister under section 85 (1) of the Act;

"**Licence**" means this Type "A" Water Licence No. 3AM-IQA1626, issued by the Nunavut Water Board to the City of Iqaluit in accordance with the Act;

"**Licensee**" means the entity to whom Licence No. 3AM-IQA1626 is issued or assigned;

"**Minister**" means the Minister of Indigenous and Northern Affairs Canada (INAC);

"**Modification**" means an alteration to a physical work that may introduce a new structure or eliminates an existing structure and does not alter the purpose or function of the work;

"**Monitoring Program**" means the program to collect data on surface water and groundwater quality to assess impacts to the environment of an appurtenant undertaking;

"**Monthly**" means, in the context of monitoring frequency, one sampling event occurring within calendar month with a minimum of twenty-one (21) days between sampling events;

"**Nunavut Land Claims Agreement**" **(**NLCA) means the "*Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*," including its preamble and schedules, and any Amendments to that agreement made pursuant to it;

"**Quality Assurance / Quality Control (QA/QC)**" Quality Assurance means the system of activities designed to better ensure that quality control is done effectively; Quality Control means the use of established procedures to achieve standards of measurement for the three principle components of quality: precision, accuracy and reliability;

"**Quarterly**" means divisions of the calendar year, comprised of three month intervals from January to December, inclusive (January – March, April – June, July – September and October – December);

"**Regulations**" means the *Nunavut Waters Regulations* (SOR/2013/669 18th April, 2013);

"**Sewage**" means all toilet wastes and greywater;

"**Sewage Lagoon Facility**" refers to the waste disposal facility and associated structures designed and constructed to treat Sewage in the City of Iqaluit since 1978, which has also been upgraded in subsequent years;

"**Sludge Management Facility**" means the facility located within the West 40 Landfill that is used for the disposal and treatment of sludge generated by the Wastewater Treatment Plant;

"Solid Waste Facility" means the West 40 Landfill, Sludge Management Facility and all other facilities identified in the Application that are designed and constructed to manage solid waste generated by the City of Iqaluit;

"Surface Drainage" means all surface waters resulting from the flow over, through or out of an operations area and is collected by means of Engineered structures;

"**Undertaking or Undertakings**" means an undertaking or undertakings in respect of which Water is to be used or Waste is to be deposited, as classified in Schedule 1 of the *Regulations*;

"**Upgraded Wastewater Treatment Plant (UWWTP)**" means the current Wastewater Treatment Plant, which was designed, constructed, and commissioned under Phase 1, for the preliminary treatment of Wastewater, in addition to the infrastructure scheduled for construction and commissioning by December 2018, under Phase 2, for the secondary treatment of Wastewater as described in the Application;

"**Use**" means use as defined in section 4 of the Act;

"**Waste**" means Water as defined in section 4 of the Act;

"**Waste Treatment Facilities**" refers to all facilities constructed and operated by the City of Iqaluit to manage solid and liquid Waste associated with this licence.

"**Wastewater**" means the water generated by site activities or originates on-site that requires treatment or any other water management activity;

"**Wastewater Treatment Facilities**" means the Sewage Lagoon, Wastewater Treatment Plant, Upgraded Wastewater Treatment Plant and associated facilities authorized under this Licence;

"**Wastewater Treatment Plant**" means the engineered system, located adjacent to the Sewage Lagoon Facility that is designed for the containment and preliminary treatment of Sewage generated by the City of Iqaluit as described in the Application;

"**Water or Waters**" means water as defined in section 4 of the *Act*;

"**Water Treatment Facility**" means the engineered facilities and appurtenances designed and constructed for the withdrawal storage treatment and distribution of fresh water for domestic purposes, described in the Application; and

"**West 40 Landfill**" means the Solid Waste Facility or original landfill facility along with its Northern Expansion and Sludge Management Facility that is designed to manage solid waste generated by the City of Iqaluit.

Schedule B: Annual Reporting Requirements

The Annual Report referred to in Part B, Item 1, shall include the following:

a. The monthly and annual quantities in cubic metres of fresh Water withdrawn from the Lake Geraldine Reservoir at Monitoring Station No. IQA-01;
b. The monthly and annual quantities in cubic metres of any Discharges from the Wastewater Treatment Facilities at Monitoring Stations IQA-02, IQA-04, and IQA-08;
c. Copy of reports generated from Dam Safety Inspections and Dam Safety Reviews along with the Licensee's proposed actions to address issues identified and/or updates on continuing actions to address issues;
d. The monthly and annual quantities in cubic metres of sludge removed from the Wastewater Treatment Facilities;
e. The monthly and annual quantities of Wastes disposed of at the West 40 landfill;
f. A summary report which includes all data and information generated under the Monitoring Program, including the QA/QC program, in electronic and printed formats acceptable to the Board;
g. A summary of all construction activities carried out for facilities under the Licence;
h. A summary of modifications and/or major maintenance work carried out on the potable Water Treatment and Waste Treatment Facilities, including all associated structures;
i. A progress report and revisions (if applicable) to any studies requested by the Board that relate to Waste management, Water use or reclamation and a brief description of any future studies planned by the Licensee including, a non-technical executive summary for the general public, translated into Inuktitut;
j. Any revisions required, in the form of addenda, to Plans, Manuals and Reports approved under the Licence;
k. A list and description, including volumes and Spill Report Line Identification Number, of all un-authorized Discharges, spills and summaries of follow-up action taken;
l. A summary of any closure and reclamation work undertaken and an outline of any work anticipated for the next year, including any changes to implementation and scheduling;
m. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector;
n. A brief update on the implementation plan of all facilities within the scope of this Licence including changes projected implementation and status of the Upgraded Wastewater Treatment Plant;
o. A summary of any studies, reports and plans requested by the Board that relate to Waste disposal, Water use or reclamation and a brief description of any future studies planned; and
p. Any other details on the use of Water or Waste disposal requested by the Board by November 1st of the year being reported.

Schedule I: Condition Applying to Monitoring

Table 1 – Water Quality Parameters		
Test Groups	**Analytical Parameters**	**Units**
Routine (R)	Alkalinity, Acidity, Chloride, Carbonate, Bicarbonate, Total Hardness, Hydroxide, Sulphate, Total Suspended Solids (TSS), Total Dissolved Solids (TDS**),** Total Organic Carbon (TOC), Total Inorganic Carbon (TIC)	mg/L
	pH (field and lab)	pH units
	Oxidation-Reduction Potential (ORP) (field)	mV
	Conductivity (field and lab)	uS/cm
	Temperature (field)	^{o}C
	Turbidity	NTU
Effluent (E)	Total Suspended Solids (TSS)	mg/L
	Temperature (field)	^{o}C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Acute Lethality (AL)	Based on Environment Canada's *Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout* (EPS 1/RM/50, March 2008), if single concentration test fails and un-ionized ammonia concentration is less than or equal to 1.25 mg/|L	"Pass" / "Fail"
ICP- Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	mg/L
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	mg/L
Biological (B)	Biochemical Oxygen Demand	mg/L
	Total and Fecal Coliform	CFU/100 mL
Potable Water (PW)	Fecal Coliform	CFU/100 mL
	ICP Metals (Total and dissolved)	mg/L
	Total Suspended Solids –TSS	mg/L
Flow (F)	Volume	m^3
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs) Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	mg/L

Table 2[1] - Water Quality Monitoring Criteria

Station ID	Description	Status	Parameter	Testing / Measurement Frequency	Reporting Frequency
IQA-01	Lake Geraldine Reservoir – Raw Water	Active	R, PW	Monthly	Biannually
			F	Monthly	
IQA-01(#)	Based on Part I, Item 4 of Expired Licence	Inactive	N/A	N/A	N/A
IQA-02	Sewage Lagoon – Effluent Discharge Point	Active	B, N, E, ICP	Once prior to discharge; once during discharge; and once prior to the completion of discharge	Annually
			F	During decant	
IQA-03	Sewage Lagoon – Influent	Inactive	N/A	N/A	N/A
IQA-04	Wastewater Treatment Plant - Effluent	Active	B, N, E, ICP	Quarterly – Prior to commissioning of the WWTP	Annually
			B, N, E, ICP	Monthly – Following commissioning of the WWTP	
			AL	Annually – following commissioning of the WWTP	
			F	During Discharge	
IQA-05	Wastewater Treatment Plant - Influent	Active	B, E, N, ICP	Biannually – Prior to commissioning of the WWTP	Annually
				No testing requirements following commissioning of the WWTP	N/A
IQA-06	Sludge – From WWTP	Active	B, E, N, ICP	Quarterly	Annually
IQA-07	Surface Water entering West 40 Landfill – Based on Part E, Item 4 of the Expired Licence	Inactive	N/A	N/A	N/A

Station ID	Description	Status	Parameter	Testing / Measurement Frequency	Reporting Frequency
IQA-08	West 40 Landfill – Effluent Discharge Point, Based on Part E, Item 4 of the Expired Licence	Active	B, E, N, ICP, F, LS	Once prior to discharge; once during discharge; and once prior to the completion of discharge	Annually
			F	During Discharge	
IQA-08(#)	Based on E, Item 17, Part F, Item 10 & Part I, Item 4 of the Expired Licence	Inactive	N/A[2]	N/A	N/A
IQA-08A	Station situated up-gradient of West 40 Landfill	Active	B, E, N, ICP, F, LS	Annually	Annually
IQA-08B	Station situated down-gradient of West 40 Landfill	Active			
IQA-09	Contaminated soil accepted at the West 40 Landfill	Inactive	NA	N/A	N/A

[1] Table 2 may be modified by the Board and re-issued where necessary. Re-issuance is not considered an Amendment to the application or Licence as defined in the *Act.*
[2] Means not applicable

PERMIT TO PRACTICE
DILLON CONSULTING LIMITED
Signature
Date September 4, 2026
PERMIT NUMBER: P 010
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
S.J. GREELEY
LICENSEE
09-04-2026
NT/NU

END OF SECTION

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□

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END OF SECTION

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Drawing No.	Rev.	Title
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C5	0	Queen Elizabeth II Way Street - Culvert Replacement Plan and Profile
C6	0	Sections and Miscellaneous Details
C7	0	Sections and Miscellaneous Details

END OF SECTION

PART 1 GENERAL

1.1 CONTRACT DOCUMENTS

.1 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 and material, equipment, superintendence and transportation necessary for the proper 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 standards.

Should there be any conflicts in the drawings with the Contract Documents, the Contractor shall notify the Engineer. The Engineer's decision on questions arising under the Contract Documents or the interpretation of the Specifications and Drawings shall govern.

.2 Contract documents are diagrammatic only. They are intended to establish scope, materials and quality; they are not detailed installation drawings. Minor details and incidental accessories required for the proper installation which are not shown or specified are to be included in the work.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 The Contractor shall supply all materials, labour and equipment for construction of the work indicated within these Contract Documents. The following description is intended to provide a general overview and is not to be considered a “scope of work”.

.2 The purpose and objective of this project is to replace the existing culvert crossing at Nipisa Street and Queen Elizabeth II Way, including removal and disposal of the existing culvert, excavation, bedding preparation, installation of the new culvert, backfilling, embankment reconstruction, ditch/channel restoration, and erosion and sediment control. The project also includes replacement of the affected sanitary sewer and watermain infrastructure within the project limits, including removal of existing pipes, installation of new sewer and watermain, fittings, valves, service reconnections where required, testing, flushing, and disinfection of the watermain. Associated works include roadway reinstatement with granular base/subbase, compaction, grading, driveway or access tie-ins where impacted, removal and installation/reinstatement of guiderail, traffic control, temporary water management, utility coordination, construction staging, and all related works necessary to complete the culvert, sewer, watermain, roadway, and roadside safety improvements

1.3 .FURNISHED ITEMS

.1 Contractor Responsibilities:

.1 Designate submittals and delivery date for each product in progress schedule.

.2 Review shop drawings, product data, and other submittals. Submit to Consultant notification of any observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Receive and unload products at site.

.4 Inspect deliveries jointly with Owner, record shortages, and damaged or defective items.

.5 Handle products at site, including uncrating and storage.

.6 Protect products from damage, and from exposure to elements.

.7 Assemble, install, connect, adjust, and finish products.

.8 Provide installation inspections required by public authorities.

.9 Repair or replace items damaged by Contractor or Subcontractor on site (under his control). Deliver supplier's bill of materials to owner

1.4 QUALITY ASSURANCE

.1 Only tradespeople properly licensed in Nunavut for work requiring special skills shall be employed on such work, and under no circumstances shall any tradesperson carry out work for which they have insufficient ability or training.

All materials, fabrication and equipment shall be of reputable manufacturer, and where a product by a manufacturer is noted in the Plans or Specifications, it is to indicate a standard of acceptance for the particular application or approved equal.

1.5 MINIMUM STANDARDS

.1 In the absence of other standards being required by the Contract Documents, all work shall conform to or exceed the minimum standard of the Canadian Government Specification Board, the Canadian Standards Association, or the National Building Code of Canada (latest edition with all current addenda), whichever is applicable.

1.6 DETAIL DRAWINGS AND INSTRUCTIONS

.1 The Engineer shall furnish, as necessary for the performance of the work, additional instructions by means of drawings or other media, which shall be consistent with the Contract Documents and the Contractor shall perform the work in accordance with such instructions.

If either the Contractor or the Engineer so requests, they shall jointly prepare a schedule, fixing the dates at which the various detail drawings will be required, and the Engineer shall furnish them in accordance with this schedule.

1.7 JOB CONFERENCES AND MEETINGS

.1 Job conferences will be jointly arranged weekly between the Contractor, the Engineer and Owner during the progress of the job and when called upon to do so, the job conference shall be attended by an authorized representative of the trade concerned and as described in Section 01 31 19 – Project Meetings. The Contractor shall furnish accommodation for all the job conferences. Notes shall be typed up afterwards by the Engineer and then circulated to all parties concerned.

.2 The Engineer shall prepare the agenda for the progress meetings and shall be responsible for minuting and circulating the minutes of the meetings to all parties concerned. The agenda for the progress meetings shall include, as a minimum, the following:

.1 Review and acceptance of minutes from previous meeting.

.2 Review of work progress.

.3 Review of planned work prior to next progress meeting.

.4 Construction issues, such as submittals, health and safety, coordination, field observations, problems, conflicts which may result in changes to the contract price or construction schedule.

.5 Review of the construction schedule versus actual progress schedules and progress monthly progress claims.

.6 Review of contemplated changes notices / contract change orders / field orders and field instructions.

.7 Review of outstanding items from previous meeting.

.8 Date and location of next progress meeting.

.9 Other business.

1.8 INSPECTOR AND INSPECTION

.1 All work covered under this Contract shall be done to the satisfaction of the Engineer or their Inspector.

.2 The Engineer's Inspector is to ensure that the provisions of the Contract are adhered to. The Inspector shall ensure that the quality of workmanship and materials are to the standards specified in the Contract. The Engineer or his Inspector may stop the work entirely if there is not a sufficient quantity of approved materials on site, or for any reason they deem will adversely affect the quality of work.

.3 All materials and equipment, and their processes of preparation or manufacture, shall be subject to inspection, and testing at all times. If an inspection or a test is failed, the Engineer may reject the affected material or equipment.

.4 The Engineer shall give the Contractor reasonable notice of any inspection or testing they wish to carry out, except for any inspection or testing specifically stated in the Contract which requires the presence of the Engineer. The Contractor shall be responsible to provide the Engineer at least seven (7) days notice, in writing, to the commencement of the manufacturing or preparation of any materials or equipment which the Contract requires inspection or testing. The Contract shall make all the necessary provisions and provide any assistance required, so that the Engineer can carry out the specified inspection or testing.

.5 If, for any reason, any inspection or testing has not been carried out, the Contractor shall notify the Engineer and any effected material or equipment shall not be delivered to the site of work until authorized by the Engineer, in writing, to do so.

.6 In any event, no materials or equipment required by the Contract or by the Engineer to be inspected or tested by or in the presence of the Engineer shall be incorporated into the work until the required inspection or testing has been carried out to the satisfaction of the Engineer.

.7 The Contractor shall provide, and shall ensure that all Subcontractors and those carrying out the process of preparation or manufacture shall provide, every reasonable facility and cooperation to assist the Engineer or Inspector or others designated by the Contract or by the Engineer in carrying out inspection and testing.

.8 The Contractor shall not backfill or otherwise cover up any work without either having it inspected and passed by the Inspector, or first notifying the Inspector in a manner approved or as directed by the Engineer, that the work is ready to be covered up and allowing the inspector reasonable notice and opportunity for carrying out an inspection. Failure to do so will require the Contractor to re-excavate the site to allow for inspection, and re-backfill the site at the Contractor's expense.

.9 Any works covered up, other than in accordance to the foregoing, shall be uncovered or opened up as ordered by the Engineer or the Inspector. All subsequent work, either through the inspection and testing or the opening and reinstatement shall be carried out by the Contractor at his expense.

.10 No approval by an Inspector or by the Engineer or failure of an Inspector or the Engineer to carry out an inspection shall relieve the Contractor of his obligations under the Contract or shall be interpreted as being an acceptance of defective or improper work or material.

.11 If, in addition to the inspection provided for above, the Contractor is required by the Contract, by law, by local bylaw or by the Engineer to have any part of the work inspected by others, the Contractor shall give the Engineer and the others concerned reasonable notice of the time and date proposed for the additional inspection.

1.9 COMPACTION TESTING/ INSPECTION REQUIREMENTS

.1 Contractor shall be responsible to hire a third party Laboratory/Inspection/Testing Agency for all compaction testing of all soils / granular / asphalt material including supplying all necessary nuclear moisture/density gauges and ancillary equipment required to conduct field density and field moisture measurements for QC compaction testing of earth and granular materials as detailed in Section 01 45 00 – Quality Control

.1 All tests are the responsibility of the Contractor and costs shall be included within this tender price.

1.10 LAYING OUT WORK

.1 The Engineer, prior to commencement of the work only, will provide sufficient control points to allow layout by the Contractor. The Engineer shall also set a job benchmark. The Engineer shall advise the Contractor by means of a sketch plan, as to the location of the stakes, benchmarks, and their elevations. The Contractor shall, before commencing the work, satisfy himself as to the meaning and accuracy of the stakes provided by the Engineer.

.2 The Contractor is required to perform all verifications in the field to confirm existing site conditions prior to executing the Work.

.3 Unless otherwise specified, all work to be performed under this Contract is to be laid out by the Contractor. The Contractor shall employ competent personnel to accurately set out all lines and establish all levels. The Contractor shall provide and set in place all necessary batter boards, sight rails, stakes and marks and shall establish bench marks to the satisfaction of the Engineer. The Contractor shall also provide the Engineer with competent assistance required for checking such lines and levels. The Contractor shall be responsible for the accuracy of lines, grades, and levels.

.4 The Contractor shall carefully preserve benchmarks, reference points, and stakes, and in case of willful or careless destruction, The Contractor shall be charged with the resulting expense of re-establishment and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

.5 The Contractor shall provide and maintain all necessary watchmen, barriers, fences, warning lights and signs and take all necessary precautions for the protection and safety of workmen and the public. All excavations or obstructions shall be clearly marked between sunset and sunrise with warning flares or lights. Should any of the Contractor's work cause interference with any existing public road, the Contractor shall provide and maintain the necessary detour roads and shall post such signs, warnings and protection as may be required for public convenience and safety.

.6 For the following works,

.1 Any road closure (through a Public Works road closure permit)

.2 Any excavation work in the City right-of-way (Utility permit)

.3 Any connecting or disconnecting water and/or sewer services (Water & Sewer services Connection/Disconnection permit)

The Contractor shall notify the following stakeholders and obtain the appropriate permits as detailed in Section 01 14 00 – Work Restrictions and 01 41 00 – Regulatory Requirements for the associated works:

Municipal Office
Police Department
Fire Department
Public Works Department
Utilities Companies

.7 When the work involves work in streets, the Contractor shall erect at the commencement of the work and shall maintain during the entire period of such work, portable or other signs, and flagmen when working on major roads, as requested by the Engineer. The Contractor shall provide such number of signs as may be required by the Engineer.

.8 The Contractor shall continuously maintain adequate protection of all work from damage and shall protect the Owner's property from injury or loss arising in connection with this Contract.

.9 The Contractor shall make good any damage, injury or loss to his wok and to the property of the Owner, except as per provisions in General Conditions in the Contract Documents or caused by agents or employees of the Owner. The Contractor shall adequately protect private and public property, as provided by law and the Contract Documents.

1.11 CUTTING AND PATCHING

.1 Coordinate all work with other trades.

.2 Coordinate locations and installation of sleeves, inserts and supports with other trades.

.3 Provide sleeves and openings required for mechanical work.

.4 Submit and proposed methods to Engineer and obtain permission prior to any cutting or drilling.

1.12 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

1.13 CONTEMPLATED CHANGE NOTICE (CCN)

.1 A Contemplated Change Notice does not constitute a direction to perform the change of works described within. It is solely a notice of a proposed change. Upon receipt of a contemplated change notice, the Contractor shall submit to the Engineer, within the timeframe reference within the document a cost adjustment to the contract associated with the proposed change, as well as any impact that the proposed change will have on the construction schedule. The cost adjustment and scheduled adjustments shall be itemized as required within the Contemplated Change Notice.

1.14 CONTRACT CHANGE ORDER (CCO)

.1 Acceptance of a Contract Change Order by the Owner and the Contractor will constitute a change in the terms, cost and/or schedule of the contract as set forth in the Contract Change Order. The Contract Change Order will be based on a Contemplated Change Order submitted by the Contractor. Contract Change Orders, signed by the Owner and Contractor shall authorize the Contractor to proceed with the change in the scope of work as described with the Contract Change Order.

1.15 FIELD INSTRUCTIONS

.1 Field instructions may be issued during the course of construction as a mechanism to provide clarification to specific items within the Contract or to give additional instructions to the Contractor. Issuance of a field instruction shall not result in any changes to the contract price or the contract schedule.

1.16 FIELD ORDER

.1 Field order may be issued by the Engineer during the course of construction to authorize a change or authorize additional work in an emergency situation where following the process of issuance of a Contemplated Change Notice and Contract Change Notice may result in a delay which could result in damage or injury to life or property or would have an adverse effect on the total cost of the Contract. The field order shall either set a firm cost adjustment for the work or shall include a method for determining the cost of the work (i.e., unit price or cost of labour or material) set forth in the field order.

1.17 RESPONSIBILITY REGARDING EXISTING UTILITIES AND STRUCTURES

.1 The Contractor shall pay for all necessary alterations of any utilities that intersect the line of the proposed work. Excavation in the vicinity of existing structures and utilities shall be carefully performed, and any utilities which cross an excavation must be properly supported or shored to prevent settlement. Where trenching is to be done under existing utilities, such utilities shall be shored before excavation commences and shoring shall be left in place.

.2 The existence, location and elevation of underground utilities are not guaranteed, and notwithstanding any other provision in the Contract, the Contractor shall be responsible

for determining the location and elevation of all sewer, water mains, services or lines, electric light, power or telephone conduits, or other such structures or utilities, and shall pay for any service supplied by the Waterworks, Sewer, Electric Light Company or Department, or by any other company or department for the location of utilities and the Contractor shall be responsible for notifying the appropriate company, department, person or persons, of his intention to carry out operations in the vicinity of any such main, line, conduit or other such structure or utility, at least one (1) week in advance of any such operations being there carried out.

.3 The Contractor shall deposit with the Engineer a letter, or letters, from the appropriate authority of the utility or utilities involved stating that the Contractor has made satisfactory arrangements with the utility organization for the location, protection and inspection of the utility involved. The Contractor shall be responsible for any costs incurred in the process.

.4 Where utilities are to be moved, the Contractor shall make his own arrangements with the Utility Company or department concerned for the alterations necessary and will notify the Engineer of all such requirements.

.5 The Contractor shall be responsible for the protection of all survey monuments, posts, and markers. All disturbed monumentation shall be reinstated by the Contractor at his cost by a duly licensed Land Surveyor.

1.18 AIR AND WATER POLLUTION

.1 The attention of the Contractor is called to the Ordinances of Nunavut relating to the pollution of water and air. The Contractor shall carry out his operations in conformity with the applicable sections of the Territorial Ordinances and regulations that are adopted thereto.

1.19 SUBMITTALS

.1 General:

.1 In accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide shop drawings and product data for all materials stipulated in the specifications or drawings.

.3 Submit four (4) prints of submittals for each requirement requested in specification Sections and as the Engineer may reasonably request.

.4 Submit to Engineer submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in work.

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

.6 Review submittals prior to submission to the Engineer. Submittals not stamped, signed, dated, and identified by the Contractor will be returned without being examined and shall be considered rejected.

.7 Contractor’s responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer review.

.2 Shop Drawings and Product Data

.1 The term “Shop Drawings” means drawings, technical documents, plans, diagrams, illustrations, schedules, performance charts, brochures, and other data which are to be provided by the Contractor to illustrate details of a portion of work.

.2 Adjustments made on shop drawings by the Engineer are not intended to change the Contract Price. If adjustments affect the value of work, state in writing to the Engineer prior to proceeding with the work.

.3 Make changes in shop drawings as the Engineer may require, consistent with Contract Drawings. When resubmitting, notify the Engineer in writing of any revisions other than those requested.

.4 Submit four (4) prints of shop drawings for each requirement requested in specification Sections and as the Engineer may reasonably request.

.5 Submit four (4) copies of product data sheets or brochures for requirements requested in specification Sections and as the Engineer may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

.3 As-built drawings:

.1 Prior to start of testing finalize production of as-built drawings.

.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Engineer for approval and make corrections as directed.

.4 Submit completed reproducible and electronic as-built drawings.

1.20 SAMPLES

.1 The Contractor shall furnish for the Engineer's approval all samples required by the Contract or as requested by the Engineer. The work shall be in accordance with the approved samples.

1.21 "OR EQUAL" MATERIALS

.1 Any place in the Drawings or Specifications where "or equal" is specified, the "or equal" shall be submitted to, and be approved by the Engineer in writing. Detailed plans and specifications of the alternate materials shall be submitted to the office of the Engineer, and unless written permission is given for their use, they will not be considered for this Contract.

In the submission of alternatives or equals to items of material mentioned in the Specifications, the Contractor shall in his Tender make consideration for any changes required in the works to accommodate such alternatives or equals. A claim by the Contractor for an addition to the contract sum because of changes in work necessitated by the use of alternatives or equals will not be considered.

1.22 ALTERNATIVE MATERIALS

.1 The contract price shall be based on the materials specified within the contract documents.

.2 Approval of alternate materials submitted by the Contractor or his Subcontractor as equal to that specified does not relieve the Contractor of any responsibility.

.3 Revisions required to allow the use of accepted alternates shall be at the Contractor's expense. No increase in the contract price will be considered to accommodate the use of materials or products other than those specified.

1.23 RECORD DRAWINGS

.1 A set of drawings and specifications recording the changes and deviations are to be maintained on site and updated daily.

.2 A set of final record drawings is to be submitted to the Engineer within two (2) weeks of completion and acceptance of the work. Failure to maintain and submit the record drawing, requiring the work to be carried out by other will be at the contractor's expense.

.3 A copy of the drawings and specifications for the purpose of maintain the record drawings, will be provided by the Engineer.

1.24 SUBSTANTIAL COMPLETION INSPECTION

.1 The Engineer is to be advised a minimum of five (5) day in advance of the desired date for the Substantial Completion Inspection.

.2 It is the Contractor's responsibility to ensure all systems are operational prior to the inspection, and that the work is substantially complete. The Contractor shall be responsible for any expenses resulting for the work not being functional or substantially complete resulting in the requirement for a subsequent Substantial Completion Inspection, including the Engineer's and Owner's time and expenses.

.3 All deficiencies noted in the Substantial Completion Inspection shall be addressed in a timely manner, normally within two (2) weeks unless otherwise specified within the Certificate of Substantial Completion.

1.25 SANITARY REGULATIONS

.1 The Contractor shall prohibit and prevent the committing of nuisance on the site of the work or on adjoining property and shall discharge any employee who commits a nuisance.

.2 The Contractor is to provide a toilet on site.

1.26 WORK RESTRICTIONS

.1 Refer to Section 01 14 00 – Work Restrictions

1.27 ABBREVIATION REFERENCES

.1 Reference to technical society, organization or body is made in the Specifications in accordance with the following abbreviations:

AISC	American Institute of Steel Construction
ARCA	Alberta Roofing Contractors Association
ASA	American Standards Association
ASTM	American Society for Testing Materials
AWI	Architectural Woodwork Institute
AWSC	American Welding Society Code
BCLMA	British Columbia Lumber Manufacturer's Association
CBURA	Calgary Built-Up Roofers Association
CCA	Canadian Construction Association
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CGSB	Canadian Government Specifications Bureau
CLA	Canadian Lumberman's Association
CRCA	Canadian Roofing Contractor's Association
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
CUA	Canadian Underwriters Association
API	American Petroleum Association
AWWA	American Water Works Association
ASME	American Society of Mechanical Engineers
MTTAC	Marble, Tile and Terrazzo Association
NBC	National Building Code (Canada) 1980
NRC	National Research Council (Canadian)
RAIC	Royal Architectural Institute of Canada
UL	Underwriter's Laboratories, Inc. (Canada)
CEC	Canadian Electrical Code

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Work

.2 Section 01 35 29.06 – Health and Safety Requirements

.3 Section 01 41 00 – Regulatory Requirements

1.2 CONTRACTORS USE OF PREMISES

.1 Normal working hours shall be Monday to Sunday, 7:00am to 7:00pm. No work shall be permitted outside of these hours within the Contractor first obtaining written approval from the City Representative and Owner, five (5) working days in advance of the planned work.

.2 The Contractor shall arrange with the City for easements for construction, storage and access to all the Works within the Owner's property line.

.3 Do not enter upon or occupy with workers, tools or materials any land other than public streets, roadways, rights-of-way's or easements shown on the Contract Drawings except after written consent has been received from the property owner.

.4 The Contractor shall obtain written approval from the City Representative for shutdown and tie-in work to existing facilities and structures. The City's staff will be responsible for operations of the existing facilities and structures during the construction period.

.5 The Contractor shall obtain written approval from the City Representative for work that will be executed within a municipal right-of-way, and for partial or full closure of municipal roadways.

.6 Do not impede normal operation of existing facilities and structures.

1.3 ENTRY OF OWNER'S STAFF INTO CONTRACTOR'S WORKING LIMITS

.1 The Owner may require access to the work site during the construction period for the purpose of maintaining normal operation of City infrastructure and services. Cooperate with the Owner in scheduling construction activities to facilitate the Owner's usage and to minimize conflict.

.2 Maintain the entire works free of debris, snow and ice at all times, including access to all buildings, facilities and structures which continues to be operated and/or maintained by Owner's staff.

.3 Prepare a written procedure regarding the entry of Owner's staff into the construction site and submit to the City Representative for review. The procedure must be communicated to all operating staff who may enter the construction site.

1.4 CONSTRUCTION COORDINATION WITH CITY OPERATIONS STAFF

.1 The existing facilities, structures and systems operate 24 hours a day, 7 days per week. In the event of a conflict between construction operations and routine City operations, City operations have priority. Take every precaution to avoid interfering with routine

operation and maintenance activities. Reschedule construction activities, if required, without change to the contract price.

.2 Coordinate activities on the site and in the existing buildings/ facilities/ structures with the City Representative.

.3 The Contractor must identify work activities that may impact the operation and maintenance activities of the City operations staff, in advance of the scheduled work, at least 5 business days prior to the work. The Contractor shall submit to the City Representative a detailed work plan listing work activities for the next 14 calendar days, detailing the works that will affect City operations staff.

.4 Do not close lines, open or close valves, or take other action which would affect the operation of the existing systems, except as specifically required by the Contract Documents and only after the prior authorization of the City Representative has been obtained.

.5 Coordinate the proposed work with the City Representative prior to process shutdowns. Under no circumstances stop the work at the end of a normal working day if such action may cause a cessation of any facility or structure operating process. In such cases, remain on site until the necessary work is complete.

.6 Coordinate activities on the site and in the existing buildings/ facilities with the City Representative.

.7 Perform work continuously during critical shutdown, connection and changeover, and as required to prevent interruption of the facility operation or City services.

.1 All temporary equipment, tools, materials, labour, and miscellaneous equipment must be scheduled and available at the Site in advance of any shutdowns. The Owner will not be responsible for delays or claims as a result of the Contractors lack of coordination.

.2 The City reserves the right to cancel any scheduled shutdown if system or weather conditions dictate, at no additional cost to the City.

.3 Prior to making major tie-ins to existing process units and structures, demonstrate that the equipment installed in all new structures is fully functional. Connections to existing works will not be permitted until all equipment in the new adjacent works operates to the satisfaction of the City Representative. No claim for delay will be entertained due to unsatisfactory operation of any equipment.

.8 Operations provided by City staff:

.1 Access to City facilities and structures.

.2 Opening and closing of existing valves and gates in existing buildings, structures, or systems.

.3 Isolation of existing process piping.

.9 In the event any existing facility or structure is damaged, changes mode of operation or there is a risk of actual process upset due to the Contractor’s work activity, the Contractor shall stop work immediately, contact the City Operations representative, report the incident to the City Representative, and make the Contractor’s on-site resources available at the request and direction of the City Operations Representative at no extra cost to the project to mitigate any damage.

.10 Contractor shall supply and maintain all appropriate and necessary equipment for confined space entry operations in accordance with applicable regulations.

.11 The Contractor shall coordinate confined space entry operations where multiple parties are involved in accordance with the Nunavut Safety Act and Occupational Health and Safety Regulations.

1.5 COORDINATION OF TRADES AND SUBCONTRACTORS

.1 The Contractor shall ensure cooperation with and between the trades and Subcontractors to ensure that the Work is carried out expeditiously and in a satisfactory manner. The Contractor shall be responsible for all extra costs arising from failure to properly coordinate the Work with the work of others

.2 Coordinate civil, structural, architectural, mechanical, electrical, and instrumentation and work for the equipment and systems being constructed. Planning and coordinate the work in a timely manner so that the work proceeds expeditiously.

.3 Extras will not be considered, based on differences of interpretation of the terms of references, as to which trade shall supply and install certain items or materials. Such coordination is entirely the responsibility of the Contractor.

1.6 COOPERATION WITH OTHER CONTRACTORS

.1 This Project's scope of work may overlap spatially or temporally with the adjacent/ concurrent Utilidor Project. The Contractor shall coordinate all construction schedules, site access, work zones, utility tie-ins, and staging areas with the Utilidor Project team to prevent conflicts, avoid delays, and ensure site safety throughout construction.

.2 At the interference with other contracts, jointly plan and coordinate with other contractors the work so that the project:

- .1 Will not be delayed.
- .2 Will not be endangered in any way.
- .3 Will be correctly connected.
- .4 Will not cause the City to be designated as the “Prime Contractor” as set out in the Safety Act.

.3 Where any equipment is supplied by the Owner, coordinate unloading, transfer, installation, testing and placing into operation.

.4 Where other work is in progress within or adjacent to the limits of this Contract, cooperate and coordinate with other Contractor(s), Utility Companies and the City of Iqaluit, and allow reasonable, free access to their work at all times.

.5 Cooperate and make suitable working arrangements with other Contractor(s).

.6 Notify the City Representative in advance and obtain approval in writing from the City Representative for all arrangements made with other Contractor(s).

1.7 UTILITY NOTIFICATION AND COORDINATION

.1 Coordinate the Work with various utilities within Project limits. The Contractor shall notify applicable utilities prior to commencing the Work. The Contractor shall also notify

the applicable utilities if any damage occurs, or if conflicts or emergencies arise during the execution of the Work.

.2 Should any piping, sewers, cables or similar services be encountered during performance of the work that are not known from the City or other utility companies records, the Contractor shall notify the City Representative and the appropriate utility agency and shall not proceed with their removal or cutting until direction has been provided.

1.8 WORKING WITIN THE A CITY EASEMENT AND/OR RIGHT-OF-WAY

.1 For construction work that will be taking place within a City easement and/or right-of-way, the Contractor must submit to the City Representative a completed City of Iqaluit Utility Permit application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures that will be used, the equipment that will be used.

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work.

.3 Traffic control plan.

.3 Utility permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

.4 No work can proceed until approval has been provided in writing by the City Representative.

.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

.6 Pay relevant permit fees and charges.

1.9 PARTIAL OR FULL CLOSURE OF A MUNICIPAL ROADWAY

.1 For construction work that will require a partial or full closure of a municipal roadway, the Contractor must submit to the City Representative a completed City of Iqaluit Road Closure Permit Application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures
that will be used, the equipment that will be used.

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work.

.3 Traffic control plan including drawing.

.3 Road closure permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

.4 No work can proceed until approval has been provided in writing by the City Representative.

.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

.6 Pay relevant permit fees and charges.

1.10 TRAFFIC – OPERATIONAL REQUIREMENTS

.1 Work at that requires full-road closures at the intersection of Federal Road and Nunavut Drive will only be allowed over the weekend and must be clearly scheduled in the detailed work plan.

.2 No road closures will be allowed during periods of all sea-lift arrivals and unloading activities. Contractor to ensure full-lane traffic operations for the entire construction area during these periods.

.3 Contractor to submit a detailed work plan including traffic control plan and required permits to the City and Engineer and obtain approval prior to starting the work.

1.11 WATER AND SEWER CONNECTIONS/ DISCONNECTIONS

.1 For tie-in to City water and/or sewer infrastructure, the Contractor must submit to the City Representative a completed City of Iqaluit Water & Sewer Connection/Disconnection Permit Application, along with all supplementary documents, for review and approval with the Department of Public Works and Engineering.

.1 Notify Fire Department of any planned or accidental interruptions of the water supply to fire hydrants.

.2 Limit any water service interruptions to a maximum of four (4) hours.

.1 Should interruptions be anticipated for greater than 4 hours and less than 24 hrs, the contractor shall obtain written approval from the City and Engineer.

.3 Determine timing of any interruptions of service with Engineer.

.2 Supplementary documents shall include:

.1 Brief work plan methodology describing the work that will be taking place within the easement and/or right-of-way, the means of construction, temporary structures that will be used, the equipment that will be used.

.2 Schedule outlining duration of work, along with all phases and activities that will comprise the work, along with dates/ times when City operations support is required to shutdown/ isolation of City systems.

.3 Traffic control plan.

.4 By-pass plan.

.3 Utility permits must be submitted 20 business days in advance of the planned Work. The Contractor will not be granted an extension of time to the Contract, should they fail to submit a permit application within the timelines stipulated.

.4 No work can proceed until approval has been provided in writing by the City Representative.

.5 The Contractor must account for the time to review and approve permit applications within their construction schedule.

.6 Pay relevant permit fees and charges.

1.12 EXISTING SEWER AND WATER SYSTEM - INTERRUPTIONS

.1 Contractor to notify the Fire Department, and the City's Department of Public Works of any planned or accidental interruptions of the sewer or water supply

.2 For extended interruptions to the water supply (i.e. greater than 24 hrs), additional temporary service arrangements are required to be provided by the Contractor. Temporary water & sewer service arrangements will need to be provided to the each affected user.

1.13 WORKING IN EXISTING BUILDINGS

.1 Obtain permission in writing from the City Representative prior to commencing work within an existing City building and/or facility, at least 7 business day prior to the start of work. The Contractor is to notify the City Representative what work will be taking place within the existing building, along with the measures that will be taken in order to ensure separation of work from City operations.

.2 The Contractor shall be responsible for enforcement of fire protection methods and procedures and adherence to local fire regulations, including any applicable requirements of the Safety Act and Occupational Health and Safety Regulations during the execution of the Work.

.3 The Contractor shall ensure that existing fire protection and alarm systems are not obstructed, shut-off or made inactive at any time for the duration of the Contract. The Contractor shall not use any fire hydrant, standpipe or hose system for other than fire protection purposes.

1.14 NIGHT WORK

.1 Night work will only be allowed if written permission is given beforehand by the Engineer. When any work is carried out at night, the Contractor shall supply at their own cost a sufficient number of electric or other approved lights to enable the work to be done in an efficient and satisfactory manner. Permission of the Engineer does not relieve the Contractor of the responsibility for obtaining necessary permission from local governing agencies.

END OF SECTION

PART 1 GENERAL

1.1 CASH ALLOWANCES

.1 Include in Contract Price specified cash allowances.

.2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.

.3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.4 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.

.5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.

.6 Total cash allowance as follows:

.1 $27,000 for sieve analysis, compaction testing, concrete testing, and asphalt testing. Allowance at the discretion of the City Representative.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work

1.2 TERMS OF PAYMENT

.1 Make applications for payment on account as provided in Agreement as Work progresses.

.2 Applications for payment will be made monthly.

.3 The date for Contractors submission of monthly application for payment shall be on the last business day of the month.

.4 The Contractor shall be reimbursed on a monthly basis in accordance with the instructions provided in the Bid Form.

.5 For administrative purposes, the monthly application for payment shall be in the form of a progress payment and must indicate:

- .1 Contract/ Project Title.
- .2 City of Iqaluit Service Contract number.
- .3 Progress payment number.
- .4 Date progress payment issued.
- .5 Period progress payment covers.

.6 The Contractor is to provide all relevant back-up material to validate the work that is being claimed in the monthly progress payment. This includes, but is not limited to, daily timesheets for labour and equipment, material costs, back-up invoices, etc. For work completed on a time and materials basis where daily timesheets are produced, the Contractor must present timesheets to the City Representative at the end of each workday for review and approval.

.7 The City shall reimburse Contractors for mark-ups from sub-contractors and/ or suppliers for parts, materials, and labour up to a maximum of 15%. Back-up invoices from sub-contractors and/ or suppliers/ vendors must be submitted as part of monthly application for payment. Monthly progress claims will be returned if back-up invoices are not provided.

.8 No payment will be made for the cost of work incurred to remedy errors or omissions for which the Contractor is responsible.

.9 Additional work that has been completed outside the scope of services identified in the contract, without written approval from the City Representative via the change order process, will not be paid. Contemplated changes must be presented to the City Representative for review. Should the contemplated change be endorsed, it will be presented to the City for approval via a change order. Once approved, the Contractor may proceed with the work in the field. Failure to comply with this requirement may result in no payment.

.10 All progress payment claims are to be submitted to the City Representative; they are not to be submitted to the City's Finance Department.

.11 The City will pay all invoices on a Net 30 basis, meaning payments will be made by the City within Thirty (30) calendar days of receipt and acceptance of the invoice, or the receipt and acceptance of the goods or services, whichever is later.

1.3 SCHEDULE OF VALUES

.1 Make schedule of values out in such form and supported by such evidence as City Representative may reasonably direct and when accepted by City Representative, be used as basis for applications for payment.

.2 Include statement based on schedule of values with each application for payment. Schedule of values to follow Terms of Reference sections outline.

.3 Support claims for products delivered to Place of Work by not yet incorporated into Work by such evidence as City Representative may reasonably require establishing value and delivery of products.

1.4 APPLICATION FOR PAYMENT

.1 Each month prepare a draft application for payment in the form of a progress payment claim for review and acceptance by the City Representative before submitting the monthly application for signature and payment.

.2 Application for payment must show a schedule of values, for each item of approved breakdown of Contract Price established in the Contract, the following:

- .1 Percentage and value of Work completed to date.
- .2 Percentage and value of Work previously approved for payment.
- .3 Percentage and value claimed this payment period.
- .4 Percentage and value of Work remaining to be completed.
- .5 Include separate line items for each approved Change Order executed, along with the information requested in .1, .2, .3, and .4

.3 Application for payment must include timesheets, back-up invoices from sub-contractors and/ or suppliers/ vendors, whichever applies. Where mark-ups apply per the Contract, ensure they are clearly shown.

.4 Include an updated cash flow expenditure forecast with the application for payment.

.5 Submit application for payment to the City Representative on the last business day of each month.

.6 To assist the Contractor with preparation of application for payment, the City Representative is available to meet with the Contractor on an agreed date each month, on or prior to last day of month, to review progress of Work.

.7 The Contractor and City Representative shall agree on quantity of Work performed and due for payment. Once quantity has been agreed upon, Contractor shall submit the final application for payment along with a corresponding invoice for the amount being claimed.

.8 The following shall be included for the first application for payment:

.1 Approved monthly progress claim.

.2 Coinciding invoice.

.3 A copy of Workers Safety Compensation Board Certificate of Clearance.

.4 Updated construction schedule.

.5 Updated cash flow projection.

.9 The following shall be included for the second application for payment and onwards:

.1 Approved monthly progress claim.

.2 Coinciding invoice.

.3 A copy of Workers Safety Compensation Board Certificate of Clearance.

.4 Statutory Declaration certifying that payment has actually been made in full to all subcontractors, suppliers, workmen, and others for labour, materials, and services required by Contract up to and including latest progress payment.

.5 Updated construction schedule.

.6 Updated cash flow projection.

.10 The City shall not release monies for Payment Certificates until the Contractor has provided all of the supporting documentation, as specified herein.

.11 Deviations from the above specified requirements or incomplete submissions shall require resubmission of the application for payment.

1.5 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

.1 Payment will not be made for the following:

.1 Loading, hauling, and disposing of rejected material.

.2 Quantities of material wasted or disposed of in a manner not called for under Contract Documents.

.3 Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.

.4 Material not unloaded from transporting vehicle.

.5 Defective Work not accepted by Owner.

.6 Material remaining on hand after completion of Work.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

.1 This Section is not intended to apply to mill test reports and certificates of compliance, tests to demonstrate or adjust and balance equipment and systems, or other similar requirements for quality control that are Contractor's responsibility. Particular requirements should be specified in appropriate Sections related to the product, equipment or system.

1.2 RELATED REQUIREMENTS

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

1.3 APPOINTMENT AND PAYMENT

.1 The Contractor will appoint and pay for services of testing laboratory.

.2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Engineer may require to verify acceptability of corrected work.

1.4 CONTRACTOR’S RESPONSIBILITIES

.1 Furnish labour and facilities to:

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

.2 Notify Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

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

.4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Engineer.

END OF SECTION

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.2 ADMINISTRATIVE

.1 A schedule should be developed and distributed to the Engineer and Owner for each of the following project phases:

- .1 Master plan
- .2 Pre-construction
- .3 During construction (monthly completion milestones)
- .4 Post substantial completion
- .5 Final completion

.2 Engineer will prepare agenda, schedule and administer project meetings as necessary.

.3 Provide physical space and make arrangements for meetings.

.4 Preside at meetings.

.5 Engineer will record the meeting minutes, including significant proceedings and decisions.

.6 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 SCHEDULE REQUIRMENTS

.1 Schedule based on calendar days, Monday-Friday inclusive.

.2 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.3 Plan to complete Work in accordance with prescribed milestones and time frame.

.4 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

.5 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

.6 Submit first schedule to Engineer within 15 working days of Award of Contract.

.7 Submit Project Schedule to Engineer within seven (7) working days of receipt of acceptance of Master Plan.

.8 Plan for substantial completion by DateXX.

.9 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.

.2 Granular source permitting and development; other permits.

.3 Mobilization.

.4 Testing and Commissioning.

.5 Supplied equipment long delivery items.

.6 Each bid item and project task.

.7 Final Completion.

.8 Demobilization.

1.4 PRECONSTRUCTION MEETING

.1 City Representative, Engineer, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.2 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.3 Engineer will establish agenda and meeting time.

1.5 PROGRESS MEETINGS

.1 During course of Work and monthly.

.2 Engineer, Contractor, major Subcontractors, field inspectors and supervisors Contractor, major Subcontractors involved in Work are to be in attendance.

END OF SECTION

PART 1 GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, Work package or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five (5) day work week and define schedule calendar Working Days as part of Bar (GANTT) Chart submission. Consideration may be given to working during weekends, if required to meet the project schedule.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as Work Days or Work Weeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project Work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Schedule activity durations to maximum of approximately ten (10) Working Days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit to Departmental Representative within five (5) Working Days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within five (5) Working Days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 City Representative will review and return revised schedules within five (5) Working Days.

.3 Revise impractical schedule and resubmit within three (3) Working Days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

.1 Develop detailed Project Schedules for each street derived from Master Plan.

.2 Ensure detailed Project Schedule for each road, includes as minimum milestone and activity types as follows:

- .1 Award;
- .2 Permits;
- .3 Mobilization;
- .4 Sub-base Preparation
- .5 Aggregate Base Course Placement
- .6 Paving
- .7 Site Restoration; and
- .8 Demobilization.

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular Site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples.

.3 Certificates and transcripts.

1.2 ADMINISTRATIVE

.1 Submit to Engineer submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

.3 Present shop drawings, product data, samples and mock-ups in SI metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Engineer. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

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

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer review.

.10 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow ten (10) days for Engineer's review of each submission.

.4 Adjustments made on shop drawings by Engineer are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Engineer prior to proceeding with Work.

.5 Make changes in shop drawings as Engineer may require, consistent with Contract Documents. When resubmitting, notify Engineer in writing of any revisions other than those requested.

.6 Accompany submissions with transmittal letter, in duplicate, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.7 Submissions shall include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.8 After Engineer's review, distribute copies.

.9 Submit one (1) electronic (pdf) of shop drawings for each requirement requested in specification Sections and as Engineer may reasonably request.

.10 Submit seven hard copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Engineer where shop drawings will not be prepared due to standardized manufacture of product.

.11 Delete information not applicable to project.

.12 Supplement standard information to provide details applicable to project.

.13 If upon review by Engineer, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

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

1.4 SAMPLES

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

.2 Deliver samples prepaid to Engineer's business address.

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

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Engineer are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Engineer prior to proceeding with Work.

.6 Make changes in samples which Engineer may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become the standard for quality of work and materials against which installed Work will be verified.

1.5 PROGRESS PHOTOGRAPHIC DOCUMENTATION

.1 Submit progress photographs.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Northwest Territories

.1 Safety Act, R.S.N.W.T. - Updated 2015.

1.2 MEASUREMENT AND PAYMENT

.1 There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan for review by Owner within seven (7) calendar days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.4 Submit copies of incident and accident reports.

.5 Owner will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) working days after receipt of plan. Revise plan as appropriate and resubmit plan to Engineer within seven (7) working days after receipt of comments from Owner.

.6 Owner's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.4 FILING OF NOTICE

.1 File Notice of Project with Territorial authorities prior to beginning of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Engineer prior to commencement of Work.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Engineer may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Territory having jurisdiction and advise Engineer verbally and in writing.

1.10 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Territory having jurisdiction, and in consultation with Engineer.

1.11 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Engineer.

.2 Provide Engineer with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Engineer may stop Work if non-compliance of health and safety regulations is not corrected.

1.12 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 Environmental Protection Plan (EPP)

.1 Prior to any construction or on-site Work activities, the Contractor shall develop and submit to the Owner's Representative a comprehensive and project specific EPP for the Owner's review and approval.

.2 Allow fifteen (15) business days for the Owner to review the EPP and each subsequent revision, if required.

.3 The Owner may request that subsequent revisions are made to the EPP in the event the document does not sufficiently address all required environmental concerns or mitigations.

.4 Installation of mitigation measures, construction Works, and delivery of any materials or equipment to Site shall not commence without an approved EPP.

.5 The EPP shall describe the Contractor's site-specific environmental protection actions and responsibilities during project implementation.

.6 The EPP shall include comprehensive overview of known or potential environmental issues to be addressed during construction.

.7 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.8 At a minimum, the EPP shall include the following:

.1 Names of persons responsible for ensuring adherence to the Environmental Protection Plan.

.2 Names and qualifications of persons responsible for identifying hazardous waste to be removed from Site.

.3 Names and qualifications of persons responsible for training Site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 A complete list of anticipated vehicles, equipment, and materials.

.6 The current Project Schedule.

.7 Work Area Site Plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas.

.2 Plan to include all proposed parking, staging, laydown, and refueling areas.

.3 Plan to include locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on Site.

.4 Plan to include locations of stationary Fire Control equipment.

.8 Hazardous Waste Management and Contaminant Prevention Plan.

.9 Non-Hazardous Solid Waste Disposal Plan.

.10 Air Pollution Control Plan.

.11 Wastewater Management Plan.

.12 Spill Response Plan to include procedures, instructions, and reports to be used in the event of an unforeseen spill of a regulated substance.

.13 Emergency Response Plan in accordance with the Occupational Health and Safety Act.

.14 Dewatering Plan.

.15 Traffic Management Plan.

1.2 Notification

.1 The Owner's Representative will have the right to notify the Contractor in writing of any observed noncompliance with Federal, Territorial, or Municipal environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection Plan.

.2 The Contractor is responsible for monitoring and ensuring compliance with Federal, Territorial, and Municipal environmental laws and regulations, permits, and other elements of Contractor's Environmental Protection Plan. Notification by the Owner's Representative is a courtesy only and shall not be relied upon.

.3 After notification or observation of any noncompliance, inform the Owner's Representative of proposed corrective actions.

.4 Take action only after receipt of written approval from the Owner's Representative, unless immediate action is necessary to prevent further noncompliance.

.5 The Owner's Representative may issue a stop work order until satisfactory corrective action has been taken.

.6 No time extensions or payment adjustments will be allowed for such suspensions.

1.3 Fires

.1 A fire extinguisher shall be carried and available for use on each machine or vehicle in the event of any fire to prevent the fire from burning the unit or spreading to other fuels in the immediate area.

.2 Machinery and equipment shall be operated in accordance with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.

.3 Care shall be taken when extinguishing or disposing of any potential fire ignition source.

.4 In case of fire, the Contractor (or any staff present) shall follow their own Emergency Response Plan and take immediate action to extinguish the fire provided it is safe to do so and will notify the local fire department and Owner immediately.

.5 Any fire or burning of waste materials is not permitted.

1.4 Disposal of Wastes

.1 Do not bury rubbish or waste materials on Site unless approved by the Owner's Representative.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil, or paint thinner into waterways, storm sewers, or sanitary sewers.

1.5 Drainage

.1 Develop and submit with the EPP a Dewatering Plan indicating procedures for dewatering the groundwater from the identified excavation during construction.

.2 Develop and submit with the EPP a Traffic Management Plan including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

.3 Provide temporary drainage and pumping as necessary to keep excavations and Site free from water.

.4 Ensure pumped water into waterways, sewers, or drainage systems is free of suspended materials.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances with use of siltation fences, sedimentation ponds, diversion ditches, silt curtains, sedimentation blankets, slope stabilization, and the like, all in accordance with required environmental regulations and permits.

1.6 Site Clearing and Plant Protection

.1 Protect trees and plants on Site and on adjacent properties.

.2 Minimize stripping of topsoil and vegetation.

.3 Minimize disruption to active layer.

.4 Restrict tree removal to areas indicated or designated by the Owner's Representative.

1.7 Work Adjacent to Waterways

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material.

.3 Do not dump excavated fill, waste material, or debris into waterways.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

.6 No concrete debris, paint, collected debris from pier/abutment caps, or other foreign materials shall be permitted to enter any watercourse.

1.8 Pollution Control

.1 Maintain all temporary erosion and pollution control features installed under this Contract.

.2 Develop and submit with the EPP a Hazardous Waste Management and Contaminant Prevention Plan identifying potentially hazardous substances to be used on job Site, intended actions to prevent introduction of such materials into air, water, or ground, and detailing provisions for compliance with Federal, Territorial, and Municipal laws and regulations for storage and handling of these materials.

.3 Develop and submit with the EPP a Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris.

.4 Develop and submit with the EPP an Air Pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project Site.

.5 Develop and submit with the EPP a Wastewater Management Plan identifying methods and procedures for management and discharge of wastewater which is directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of groundwater, disinfection water, hydrostatic test water, and water used in the flushing of lines.

.6 Control emissions from equipment and plant to local authorities' emission requirements.

.7 Prevent sandblasting and other extraneous materials from contaminating air beyond application area by providing temporary enclosures.

.8 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.9 Additional Mitigation Measures

.1 All Work and associated costs related to required environmental mitigation measures are incidental to the Contract scope of Work and are the responsibility of the Contractor.

.2 Work shall be scheduled so that no site is left in a state of partial completion for an extended period of time or during any shutdown period such as during winter months.

.3 All disturbed areas from construction activities require rehabilitation as part of the Contract. Erosion of steep banks shall be minimized by limiting foot, vehicle, and equipment traffic.

PART 2 PRODUCTS

.1 Not used.

PART 3 EXECUTION

.1 Not used.

PART 4 BASIS FOR PAYMENT

.1 Separate payment shall not be made for items in this Section. Included costs in related items.

END OF SECTION

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.2 REFERENCES TO REGULATORY REQUIREMENTS

.1 Perform Work in accordance with all local, territorial and federal laws, ordinances, rules, regulations, codes and orders relating to the Work, which are or become in force during the performance of the Work, including amendments up to tender closing date and other codes of provincial or local application provided that, in case of conflict or discrepancy, more stringent requirements apply.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: Except as otherwise specified, Constructor shall apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:

.1 Regulatory requirements and fees in force on date of Bid submission, and

.2 A change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

2.2 EASEMENTS AND NOTICES

.1 Owner will obtain permanent easements and rights of servitude that may be required for performance of Work.

.2 Constructor shall give notices required by regulatory requirements.

2.3 PERMITS

.1 The Owner has applied for, obtained and paid for permits related to this construction. Copies of all permits shall be provided by the Owner to the successful Contractor prior to construction.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 INSPECTION

.1 Allow the Engineer access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by the Engineer instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 The Engineer will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, the Owner will pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Engineer for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Engineer.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by the Engineer at no cost to the Engineer. Pay costs for retesting and re-inspection.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency and the Engineer in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 HOLD POINTS

.1 The contractor shall notify the Engineer and City a minimum of three (3) working days in advance of each hold point review in writing.

.2 The contractor shall not proceed with installation of grade beams or box culverts unless the engineer of record or approved representative is on site.

.3 The contractor shall not proceed with subsequent work beyond a listed point until the work has been reviewed and accepted by the Engineer or City.

.4 Failure to provide the required notice shall not be cause for a delay claim. The contractor shall coordinate the work and schedule hold point reviews in advance to avoid impacts to the construction schedule.

.5 Work completed beyond a listed hold point without review and acceptance may be rejected. The contractor shall uncover, remove, replace, repair, or otherwise make good such work as directed by the Engineer, at no additional cost to the Owner.

.6 The following hold points shall apply:

.1 Culvert Channel Dewatering: After dewatering of the culvert channel and prior to placement of piles, the contractor shall notify the Engineer and City to review the dewatered channel and confirm that the work area is suitable for pile installation.

.2 Pile Installation: After completion of pile installation and prior to construction or pouring of the grade beam, the contractor shall notify Engineer with the location, alignment and elevation of each pile.

.3 Pouring of Concrete: Concrete shall not be placed until formwork, reinforcement, embedded items, and placement condition have been reviewed and accepted.

.4 Precast Culvert Placement: Prior to the installation of the precast concrete elements, the contractor shall notify the Engineer and City to review the precast units for cracks, damage, defects, or other faults that may have occurred during fabrication, handling, transportation, or storage.

.5 Backfilling: Contractor shall notify Engineer and City to review the installed work prior to backfilling.

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by the Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of the Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Engineer.

1.7 REPORTS

.1 Submit four (4) copies of inspection and test reports to the Engineer.

.2 Provide copies to manufacturer or fabricator of material being inspected or tested and/or subcontractor of work being inspected or tested.

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by the Engineer and may be authorized as recoverable.

1.9 MILL TESTS

.1 Submit mill test certificates as requested.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CSA Group (CSA)

.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-M1978 (R2003), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M1987 (R2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96 (R2001), Signs and Symbols for the Occupational Environment.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain ladders, swing staging, temporary stairs, scaffolding, ramps, and platforms.

1.5 HOISTING

.1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists or cranes.

.2 Hoists and cranes to be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

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

1.7 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.8 SECURITY

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 OFFICES

.1 Provide office heated to 22 degrees C, lighted to 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

.4 Engineer's Site office.

.1 Provide temporary office for the Engineer.

.2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor minimum 0.3 m above grade, complete with 4 50% opening windows and one lockable door.

.3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -30 degrees C outside temperature.

.4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

.5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10% upward light component.

.6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.

.7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one drawer filing cabinet, one plan rack and one coat rack and shelf.

.8 Maintain in clean condition.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of the Engineer.

1.12 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by the Engineer.

.2 Indicate on sign, name of Owner, Engineer, and Contractor as established by the Engineer.

.3 No other signs or advertisements, other than warning signs, are permitted on site.

.4 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.

.1 Foundations: 15 MPa concrete to CSA-A23.1 minimum 200 mm x 900 mm deep.

.2 Framework and battens: SPF, pressure treated minimum 89 x 89 mm.

.3 Signboard: 19 mm Medium Density Overlaid Douglas Fir Plywood to CSA O121.

.4 Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CAN/CGSB 1.189.

.5 Fasteners: hot-dip galvanized steel nails and carriage bolts.

.6 Vinyl sign face: printed project identification, self-adhesive, vinyl film overlay, supplied by the Owner.

.5 Locate project identification sign as directed by the Engineer and construct as follows:

.1 Build concrete foundation, erect framework, and attach signboard to framing.

.2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.

.3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.6 Direct requests for approval to erect Consultant/Contractor signboard to the Engineer. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording in all official languages.

.7 Signs and notices for safety and instruction in all official languages Graphic symbols to CAN/CSA-Z321.

.8 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by the Engineer.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by the Engineer.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by the Engineer.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by the Engineer.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, sedimentation and control drawings, specific to site, or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Informational and Warning Devices.

.2 Protection and Control of Public Traffic.

.3 Operational Requirements.

1.2 RELATED SECTIONS

.1 Section 01 52 00 – Construction Facilities

.2 Section 31 24 13 – Roadway Embankments

1.3 REFERENCES

.1 Manuals of Uniform Traffic Control Devices for Canada, (MUTCD), 5th Edition February 2014, Transportation Association of Canada (TAC).

.2 Workers' Safety and Compensation Commission (WSCC) Traffic Control Plan requirements.

PART 2 TRAFFIC CONTROL

2.1 DETOURS

.1 Provide and maintain signage and barricades necessary to direct traffic around routes blocked by construction. Transportation Association of Canada standards shall be followed as a guideline.

.2 All signage and barricades shall be maintained and cleaned daily. Missing signs shall be replaced immediately.

.3 Detour routes shall be submitted to the City for review and will be subject to approval by the City. The City will require a minimum of fourteen (14) calendar days to review.

.4 The Contractor shall submit detailed, legible drawings and a written description of the proposed detours.

.5 Type and size of detour signage must be approved by Engineer.

.6 The Contractor must provide fourteen (14) calendar days notice, to all businesses and residents in the area to be affected by detours and road closures, in advance of all planned disruptions to access. Notice must be given in writing.

.7 Procedures for effecting detours and/or public traffic flow disruption shall be as follows:

.1 Contractor shall propose method of traffic signage and control to Engineer.

.2 Engineer shall review proposal and, when satisfied, make recommendation to the City.

.3 The City shall approve, modify or reject the proposal.

.4 Once proposal is approved, the City will arrange radio advertisements, and advise the Fire Department, Municipal Enforcement and the RCMP of the traffic control methods the Contractor will follow.

.5 The Contractor shall effect the detour and/or public traffic flow disruption on the day following the radio advertisements.

.8 For all road closures:

.1 Traffic detour signage plan to be provided to the City 14 calendar days prior to road closure.

.2 Notification to be provided to the City of all road and lane closures 24 hours prior to the closure. The notification is for a City working day. Example, notification on Friday will allow for a closure on Monday (or Tuesday on a holiday Monday) at the same hour of the day that the notification is given.

.3 Closure only applies to areas where use of flag persons is required for maintaining 2 way traffic

.9 The Contractor shall assign a representative on the site to oversee barricades, signage and traffic control.

.10 The City will, if necessary, allow the closure of portions of roadways affected by the proposed work for construction purposes. The City may require that only these streets shall be closed at any time. Local traffic to apartments, businesses and houses shall be maintained.

.11 The Contractor shall schedule work such that only one (1) intersection is closed to vehicle traffic at any one time. Roadway closures require the Fire Chief's approval.

2.2 PUBLIC TRAFFIC FLOW

.1 Provide and maintain flagpersons, traffic signals, barricades and flares/lights/lanterns as required to direct the flow of equipment used in performance of the work and to protect public traffic. Make arrangements with local governing authorities when these facilities will disrupt the normal flow of public traffic.

.2 Unless otherwise authorized, organize working area such that two-way traffic flow is possible at all times.

.3 Provide detailed sketches of proposed signage plans and traffic flow patterns to the City for approval at least fourteen (14) calendar days in advance of any modifications to existing conditions.

2.3 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.

.2 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to traveling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.3 Do not close any lanes of road without approval of the Engineer. Before rerouting traffic erect suitable signs and devices in accordance with instructions contained in Part D of MUTCD.

.4 Keep travelled-way graded, free of pot holes, and of sufficient width for required number of lanes of traffic.

.1 Provide minimum 7 metre wide temporary roadway for traffic in two-way sections through work and on detours.

.2 Provide minimum 5 metre wide temporary roadway for traffic in one-way sections through work and on detours.

.5 At a minimum, provide gravelled detours or temporary roads to facilitate passage of traffic around restricted construction area:

.1 Do grading for detour in accordance with Section 31 24 13 - Roadway Embankments.

.2 Place and compact granular sub-base in accordance with Section 31 24 13.

.3 Place and compact granular base in accordance with Section 31 24 13.

.6 Provide and maintain road access and egress to property fronting along work under Contract and in other areas as required, unless other means of road access exist that meet the approval of the Engineer.

2.4 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of MUTCD.

.3 Place signs and other devices in locations recommended in MUTCD.

.4 Meet with the Engineer prior to commencement of work to prepare list of signs and other devices required for project. If situation on site changes, revise list to the approval of the Engineer.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

2.5 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag persons, trained in accordance with, and properly equipped as specified in, MUTCD in the following situations:

.1 When public traffic is required to pass working vehicles or equipment which block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.

.3 When work crews or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.7 Delays to public traffic due to contractor's operators: maximum 15 min.

.2 Where roadway, carrying two-way traffic, is to be restricted to one lane, for 24 hours each day, provide portable traffic signal system. Adjust, as necessary, and regularly maintain system during period of restriction. Submit timing signal pattern for Engineer's review and approval.

2.6 OPERATIONAL REQUIREMENTS

.1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by the Engineer to protect and control public traffic, existing conditions for traffic to be restricted as follows:

.1 Construction zone speed limit of 30 km/h at all times.

.2 Maintain existing conditions for traffic crossing right-of-way except when required for construction.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 If there is question as to whether products or systems are in conformance with applicable standards, Owner reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be borne by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Owner based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Owner of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to Engineer at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Owner reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, dimensional lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Owner.

.9 Touch-up damaged factory finished surfaces to Engineer satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Owner will be paid for by Owner. Unload, handle and store such products.

1.6 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Engineer in writing, of conflicts between specifications and manufacturer's instructions, so that Engineer will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Owner to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately Engineer if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Owner reserves right to require dismissal from site, workers deemed incompetent or careless.

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

1.8 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.11 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.12 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval Engineer.

1.13 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

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

1.2 MEASUREMENT AND PAYMENT

.1 There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.3 SURVEY REFERENCE POINTS

.1 See drawings for control point locations.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Engineer.

.4 Report to Engineer when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

.1 Establish two (2) permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading and fill placement, and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

.6 Establish liner floor, drainage collection system, top of berm, and top of weir elevations.

1.5 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to Engineer.

.2 On request of Engineer, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.7 SUBSURFACE CONDITIONS

.1 Promptly notify Engineer in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Engineer determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify the Engineer in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Engineer’s inspection.

.2 Engineer’s Inspection:

.1 Engineer and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English, French, Inuktitut and Inuinnaqtun and that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested, adjusted, balanced, and fully operational.

.4 Certificates required by Fire Commissioner, Boiler Inspection Branch, and Utility companies: submitted.

.5 Operation of systems: demonstrated to Owner's personnel.

.6 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Engineer, and Contractor.

.2 When Work incomplete according to Engineer, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Engineer considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting at least one (1) week prior to contract completion with Engineer to:

.1 Verify Project requirements.

.2 Review warranty requirements and manufacturer's installation instructions.

.2 Engineer to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Two (2) weeks prior to Substantial Performance of the Work, submit to the Engineer, four (4) final copies of operating and maintenance manuals in Inuktitut and Inuinnaqtun and English.

.3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in .dwg format on USB drive.

1.4 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project:

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data.

.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Training: refer to individual Sections.

1.5 AS-BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction:

.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual:

.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition:

.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Engineer.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on one (1) set of drawings, and in copy of Project Manual, provided by the Engineer.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress:

.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 Referenced Standards to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain field test records, manufacturer's certifications, inspection certifications, commissioning certificates, and training records required by individual specifications sections.

.7 Provide digital photos for site records.

1.7 FINAL SURVEY

.1 Submit final site survey certificate, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.8 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts:

.1 Give function, normal operation characteristics and limiting conditions.

.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports.

.15 Additional requirements: as specified in individual specification sections.

1.9 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations:

.1 Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections.

1.10 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to location as directed; place and store.

.4 Receive and catalogue items:

.1 Submit inventory listing to Engineer.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.2 Extra Stock Materials:

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to location as directed; place and store.

.4 Receive and catalogue items:

.1 Submit inventory listing to Engineer.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.3 Special Tools:

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to location as directed; place and store.

.4 Receive and catalogue items:

.1 Submit inventory listing to Engineer.

.2 Include approved listings in Maintenance Manual.

1.11 DELIVERY, STORAGE AND HANDLING

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and for review by the Engineer.

1.12 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, at least thirty (30) days before planned pre-warranty conference, to Engineer’s approval.

.3 Warranty management plan to include required actions and documents to assure that the Engineer receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to the Engineer for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint four (4) month and nine (9) month warranty inspection, measured from time of acceptance, by the Engineer.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include HVAC balancing, motors, roofs, pumps, transformers, lightning protection systems, fire protection, fire suppression, alarm systems, commissioned systems.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at four (4) and nine (9) month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in timely manner to oral or written notification of required construction warranty repair work.

.11 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Engineer to proceed with action against Contractor.

1.13 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by the Engineer.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 33.01 – Excavating, Trenching and Backfilling

1.2 REFERENCES

.1 Canadian Federal legislations, the most current of:

.1 Canadian Environmental Protection Act (CEPA).

.2 Canadian Environmental Assessment Act (CEAA).

.3 Transportation of Dangerous Goods Act (TDGA).

.4 Motor Vehicle Safety Act (MVSA).

1.3 MEASUREMENT PROCEDURES

.1 Asphalt Concrete Pavement Removal

.1 Removal of asphaltic concrete pavement will be measured in square meters regardless of depth removed. No differentiation will be made between various pavement thicknesses. Dispose of asphalt in the designated area as directed by the Engineer.

.2 The unit price bid for asphalt pavement removal for the major portions of the work shall include the supply of all material, labour, equipment, tools and incidentals required to do all intermediate cutting, removals and general cleanup.

.3 Asphalt cutting will be measured for the final perimeter of asphalt removal only.

.4 Asphalt removal will not be measured for utility patch repairs designated as water/sewer and should be included in the cost of the work.

.5 Asphalt removal will be measured only for miscellaneous patch repairs designated as road/sidewalk.

.6 Asphalt cutting will also be measured for miscellaneous maintenance and repairs including road/sidewalk and water/sewer repairs.

.2 Concrete Removal

.1 Removal of concrete pavement and sidewalk will be measured in square meters regardless of thickness. Dispose of concrete in the designated area as directed by the Engineer.

.2 The tendered price shall include all costs related to removal and disposal of existing concrete, asphalt pavement, CSP pipes, as directed by the Engineer. The unit price bid for concrete, asphalt, and pipe removal shall include the supply of all material, labour, equipment, tools and incidentals required to do all cutting and general cleanup.

.3 Removal of culverts, pipe sewers and drains will be measured in meters regardless of diameter. End points of measurements will be at centres of manholes or catch basins or open ends of pipes, as applicable.

.4 Removal of manholes and catchbasins will be measured in units removed.

.5 Payment for salvage, stockpiling, sealing, disposal, alternative disposal, recycling, excavating, backfilling and restoration will be included in above removal items.

.6 Removal of waste materials designated for alternate disposal from the site will not be measured separately.

1.4 STORAGE AND PROTECTION

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

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

.3 In all circumstances ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.4 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.

.5 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.

.6 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.

.7 Protect trees, plants and foliage on site and adjacent properties. Notify the Engineer prior to the commencement of any work that might impact existing trees, plants or foliage.

1.5 EXISTING CONDITIONS

.1 Prior to the start of any demolition work, remove contaminated or hazardous materials as directed by the Engineer from site and dispose of in safe manner in accordance with TDGA and all other applicable regulatory requirements.

1.6 REGULATORY REQUIREMENTS

.1 Ensure all work is performed in compliance with all applicable Territorial and Federal regulations.

1.7 SUBMITTALS

.1 Supply certified weigh bills from authorized disposal sites for all material removed from site.

PART 2 PRODUCTS

2.1 EQUIPMENT

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

PART 3 EXECUTION

3.1 PREPARATION

.1 Inspect site with the 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 WORKMANSHIP

.1 Pavement Cutting

.1 Where a new pavement structure ties into an existing pavement structure, the Contractor shall cut back into the existing pavement structure so as to expose the complete cross section of the existing pavement structure. The cut shall be made perpendicular to the centreline of the pavement structure. All cuts shall be made in accordance with this section.

.2 The Contractor shall use as directed by the Engineer, an asphalt saw for cutting and breaking out section of pavement structure designated for removal.

.2 Pavement Removal

.1 Asphaltic concrete pavement structures requiring removal will be marked by the Engineer. All tie-in edges are to be cut as described in 3.2.1. Tearing or ripping of tie-ins is not acceptable. Disposal to be at a location approved by the Engineer.

3.3 SEQUENCES OF OPERATION

.1 Removal

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

.3 In removal of pavements, curbs and gutters:

.1 Remove to lines and grades indicated or established by the Engineer in the field.

.2 Square up adjacent surfaces to remain in place by saw cutting or other method approved by the Engineer.

.3 Use equipment and methods of removal and hauling which do not tear, gouge, break, damage or disturb pavement that is to remain.

.4 Protect adjacent joints and load transfer devices.

.5 Protect underlying and adjacent granular materials.

.4 When removing asphalt pavement for potential future incorporation into hot mix asphalt concrete paving, prevent contamination with base course aggregates.

.5 When removing pipes under existing or future pavement area, excavate at least 300 mm below pipe invert.

.6 Remove only as many trees as required during construction. Obtain written approval of the Engineer prior to removal of any trees.

.7 All trees identified by the Engineer to be healthy are to be alternately disposed of.

.8 Stockpile topsoil for final grading and landscaping. Provide erosion control and seeding if not immediately used.

.9 Provide water for the suppression of dust generated by the removal process.

.2 Removal From Site

.1 Interim removal of stockpiled material will be required by the Engineer, if it is deemed to interfere with operations of the Engineer or other contractors.

.2 Remove stockpiles of like materials by an alternate disposal option once collection of that material is complete.

.3 Only dispose of specified material by selected alternative disposal option as provided by the Engineer. Do not dispose of these materials in a landfill or a waste stream destined for landfill. Additional disposal options will be provided by the Engineer prior to disposal.

.4 All material destined for alternate disposal must be hauled to authorize disposal sites. Any deviation must be approved in writing by the Engineer.

.3 Salvage

.1 Items to be salvaged: paper, plastic, asphalt, concrete, traffic signs, etc.

.2 Carefully dismantle items containing materials for salvage and stockpile salvaged materials at locations approved by the Engineer.

.4 Sealing

.1 Seal pipe ends and walls of manholes or catch basins as indicated. Securely plug to form watertight seal.

.5 Disposal of Material

.1 Dispose of materials not designated for salvage or reuse on site as instructed by the Engineer.

.6 Backfill

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

.7 Stockpile

.1 Stockpile in accordance with Section 31 05 16 – Aggregates for Earthwork.

3.4 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

.2 Use only soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.5 CLEANUP

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

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

.3 Use only cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

.4 See Section 01 77 00 – Closeout Procedures.

3.6 REPORTING

.1 Record off-site removal of debris and materials and provide the following information regarding removed materials to the Engineer within 5 business days.

.1 Time and date of removal.

.2 Type of material.

.3 Weight and quantity of materials.

.4 Final destination of materials.

3.7 COORDINATION

.1 Coordinate alternative disposal activities with the Engineer.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.2 ASTM D5084-10, Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Samples:

.1 Allow continual sampling by Engineer during production.

.2 Provide Engineer with access to source and processed material for sampling.

.3 Install sampling facilities at stockpile site, to allow Engineer to obtain representative samples of items being produced. Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

.4 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.3 MEASUREMENT FOR PAYMENT

.1 Production of aggregate and crush gravel will not be measured separately for payment. There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.4 QUALITY CONTROL AND QUALITY CONTROL TESTING

.1 General

.1 In all sources, quality control and quality control testing are the responsibility of the Contractor throughout every stage of the Work.

.2 Tests performed by the Engineer will not be considered to be quality control tests.

.3 The Contractor shall provide, pay for and maintain equipment and qualified personnel to carry out all field testing necessary to determine and monitor the characteristics of the materials produced and the final product to be delivered.

.4 The Contractor shall provide safe and convenient means for accurately and representatively sampling each aggregate stream being produced during all screening, splitting and crushing processes.

.5 Prior to commencement of the Work, the Contractor shall provide the Engineer with his program and schedule of testing for quality control and shall demonstrate to the satisfaction of the Engineer that the program and schedule are adequate to provide reliable quality control within the limits specified.

.6 All quality control test and test results shall be calculated, recorded and submitted to the Engineer on industry standard worksheets. The tests and test results shall be certified for correctness by the Engineering Consulting Firm employed by the Contractor to perform the tests and shall be signed by the Contractor's representative. All worksheets shall be reviewed and certified for correctness by a Professional Engineer from the Engineering Consulting Firm employed by the Contractor to perform the tests, on a weekly basis at a minimum.

.2 Test Methods

.1 Unless otherwise specified, the latest edition of the following test methods shall be used to determine material characteristics:

.1 Sampling Aggregates – ASTM D75

.2 Sieve Analysis of Fines & CSA A23.2 Aggregates

.3 Sieve Analysis of Materials – ASTM C117 Finer than 75 Micron sieve by Washing

.4 Mineral Filler – ASTM D546

.5 Hydraulic Conductivity Analysis of Clay – ASTM D5084

.3 Quality Control Testing Requirements

.1 The Contractor's quality control and quality control testing program shall include the carrying out of quality control testing using the latest edition of the specified test methods at the minimum specified frequencies.

.1 Sampling

.1 Sampling ASTM D 75 One per 1,000 Aggregate tonnes (This frequency applied to – each fraction being produced).

.2 Sieve Analysis

.1 Crushed One per 1,000 Aggregate tonnes.

.1 Fine and Course ASTM A23.2-2A Fraction

.2 Materials finer ASTM C117 than 75 micron sieve by washing. (This frequency applied to each fraction being produced)

.2 Blend Sand ASTM D546 (One per 300 tonnes)

.3 Manufactured ASTM D546 Blend Sand (Mineral Filler) One per four (4) hours of plant production.

.3 Hydraulic Conductivity Analysis ASTM D5084 One per 1,000 Aggregate tonnes. (This frequency applied to each fraction being produced)

.4 Reporting of Sieve Analysis test Results and Production Quantities

.1 The Contractor shall record all sieve analysis test results on industry standard grain size curve sheets and worksheets which provide all test data, calculations, error checks, test results and any additional information requested by the Engineer. The Contractor shall also determine and record on each sieve analysis worksheet, the time and date of sampling, the total quantity of granular material

produced at the time of sampling and, where applicable, the test lot that the sample refers to.

.5 Quality Acceptance

.1 Acceptance of processed aggregates will take place when they are in their final position and have met all the requirements of the Contract. The Engineer may test at any time at the work site and reject material that does not meet the specifications. The Contractor shall promptly remove rejected material from the site.

.2 The Engineer and his representatives reserve the right to sample, test, inspect and monitor the quality of material being produced and incorporated into the work by the Contractor at any time and as often as he deems necessary. The Contractor shall cooperate with the Engineer and his representatives for such sampling, testing, inspecting and monitoring. The Engineer is under no obligation to provide the Contractor with test results and this testing shall in no way relieve the Contractor of his responsibility to produce aggregates that meet the specifications in all respects

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

.3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

.2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Greatest dimension to exceed 5 times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:

.1 Natural sand.

.2 Manufactured sand.

.3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.

.4 Granular A and Granular B to be crushed stone or Crushed Gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.5 Granular C to be crushed stone or gravel or screened stone or gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.6 Modified Granular C to be crushed stone or gravel or screened stone, gravel or sand and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.7 25mm Washed Stone to be crushed stone or gravel or screened stone, gravel, and shall be free of fines, clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.8 6" to 10" Cobble Stone (Well Graded). Gradations within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.2.

.9 200mm minus aggregate to be coarse, dense graded granular material comprised of crushed rock, recycled concrete, or pit run gravel.

.10 Table:

ASTM Sieve Designation	% Passing						
	Granular A	Granular B	Granular C	Modified Granular C	25mm Washed Stone	150-250mm Cobble	200mm aggregate
250mm	-	-	-	-	-	100	
200mm	-	-	100	-	-	20-100	100
150mm	-	-	-	-	-	0-20	
100mm	-	100	-	-	-	-	70-100
75mm	-	95-100	-	-	-	-	
50mm	-	-	-	-	-	-	50-80
38.1mm	-	-	-	-	-	-	
25mm	100	45-100	50-100	-	100	-	
19mm	85-100	-	-	-	0-80	0-10	35-60
12.5mm	65-90	-	-	-	0-20	-	
9.5mm	50-73	-	-	100	0-10	-	
4.75mm	35-55	25-70	20-100	55-100	0	-	15-35
1.8mm	15-40	-	10-100	30-100	-	-	
0.425mm	-	4-50	-	-	-	-	
0.300mm	5-22	-	2-65	10-50	-	-	
0.075mm	2-8	0-8	0-8	0-10	-	-	0-10

10. Rip-rap to have the following grading specification:

100% smaller than 450mm or 130kg
At least 20% larger than 350mm or 70kg
At least 50% larger than 300mm or 40kg
At least 80% larger than 200mm or 10kg

2.2 SOURCE QUALITY CONTROL

.1 Inform Engineer of proposed source of aggregates and provide access for sampling one (1) week minimum before starting production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.

.3 Advise Engineer one (1) week minimum in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 EXECUTION

3.1 EXAMINATION

.1 N/A

3.2 PREPARATION

.1 N/A

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 33.01 – Excavating, Trenching and Backfill

1.2 DEFINITIONS

.1 Rock: material which requires drilling, ripping or breaking up with power operated tools for its removal, and boulders and pieces of concrete exceeding volume limits as follows: Trench excavation – $0.5m^3$, Mass excavation $1.0m^3$.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Not Used.

PART 3 EXECUTION

3.1 ROCK REMOVAL

.1 Perform excavation in accordance with Erosion and Sedimentation Control Plan.

.2 Remove rock to alignments, profiles, and cross sections as indicated. Only mechanical rock breaking (pneumatic hammers, ripper teeth, etc.) are permitted on site.

.3 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.

.4 Excavate rock to horizontal surfaces with slope not to exceed local regulations.

.5 Excavate trenches to lines and grades to minimum of 150 mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe.

.6 Cut trenches to widths as indicated.

.7 Remove boulders and fragments which may slide or roll into excavated areas.

.8 Correct unauthorized rock removal at no extra cost.

3.2 CLEANING

.1 Rock Disposal:

.1 Dispose of surplus removed rock off site.

.2 Do not dispose removed rock into landfill. Send material to appropriate location as approved by Consultant.

3.3 PROTECTION

.1 Prevent damage to surroundings and injury to persons.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 29 00 – Payment Procedures.

.2 Section 31 05 16 – Aggregates for Earthworks.

1.2 REFERENCE STANDARDS

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-12(2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

.2 ASTM D1557-12(2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3).

.3 ASTM D4318-17e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3 WORK INCLUDED

.1 The work covered by this section shall include excavation, trenching, backfilling, and disposal of excess materials, as required to complete the work covered elsewhere in the contract documents.

.2 The Contractor shall provide all labour, equipment, and materials to complete the works covered by this section.

1.4 CLASSIFICATION OF MATERIAL

.1 Earth Excavation

.1 Includes the excavation of all materials except rock excavation classified hereinafter.

.2 Rock Excavation

.1 Includes the excavation of all boulders greater than 0.75 cubic metres in volume, or solid ledge rock of concrete foundations which, in the opinion of the Engineer, requires for its removal drilling and blasting or wedging or sledging or barring. No soft of disintegrated rock which can be removed with a pick, or loose, shaken or previously blasted rock will be measured or allowed. Frozen materials shall not be classified as rock nor will extra payment be allowed for excavating same.

.3 Backfill

.1 In other areas other than existing roadways, machine backfilling using approved excavated material will be permitted from the top of the granular backfill.

.4 Surplus Material

.1 Excavated material which is not required for the completion of the work.

.5 Suitable Backfill Material

.1 Material from excavation which, in the opinion of the Engineer, is suitable for use as backfill or for other processes.

.6 Unsuitable Material

.1 Material from an excavation which, in the opinion of the Engineer, is not suitable for use as backfill or other processes.

1.5 OCCUPATIONAL HEALTH AND SAFETY ACT

.1 All excavations will have to conform strictly to the requirements of the latest Occupational Health and Safety Act adopted by The City of Iqaluit.

1.6 SAFETY MEASURES

.1 Suitable warning signs, lights and barricades shall be erected for the protection of vehicles and pedestrians during construction. Watchpersons or flagpersons, when required, shall be supplied by the Contractor at their own expense.

.2 The Contractor shall comply with the instructions of a safety inspector appointed or recognized by The City of Iqaluit whose duty is to enforce territorial acts governing the excavation of trenches and the protection of same.

.3 The Contractor shall inform the City's safety inspector of their intention to excavate at least 24 hours before commencing work.

1.7 CAUTION IN EXCAVATION

.1 The Contractor must exercise proper caution in excavating and must repair and make good at their own expense any and all damage done to pipes, sewers, maintenance holes, etc. Where necessary, the Contractor shall make necessary explorations to discover location of existing pipes, conduits, services, etc.

1.8 BLASTING

.1 Retain licensed explosives expert to program and supervise blasting work, and to determine precautions, preparation and operations techniques.

.2 Submit documentation to the Engineer verifying explosives expert's qualifications in accordance to Federal and Territorial laws and Municipal ordinances.

1.9 INCONVENIENCE TO ADJACENT PROPERTY OWNERS

.1 Construction of the work shall be carried out in such a manner that a minimum of inconvenience is caused to the owners and occupants of property adjacent to the works.

1.10 WORKING RESTRICTIONS

.1 The Contractor shall be responsible for maintaining adequate surface drainage during construction. He shall provide all necessary measures to ensure that natural drainage is not impeded to the detriment of the local municipal authority, private landowners, or the public. Water pumped out or removed from a trench shall not be discharged in the

existing sewers unless permission in writing has been obtained from the authority having jurisdiction.

.2 Steel-tracked equipment will not be allowed on the pavement at any time, unless the pavement is protected by planks, pads, or other devices.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Granular Material

.1 Granulars A, B, Modified B, C, Modified C, 150mm-250mm cobble, and 25mm washed stone shall meet the requirements set out in Section 31 05 16 – Aggregates for Earthworks.

.2 Granular Backfill

.1 Backfill material shall be selected from materials taken from the excavation, if in the opinion of the Engineer, they are suitable.

PART 3 EXECUTION

3.1 PREPARATION OF THE WORK

.1 The Contractor, at their own expense, shall clear the surface or road as may be necessary for the full width and length of the proposed trenches or structures and shall dispose of all refuse in a manner satisfactory to the Engineer. The unit prices for the work shall include all costs incurred in removing material of whatever nature from the surface of the ground or road.

3.2 ALIGNMENT AND GRADE

.1 Trenches shall be dug to the alignment and grade required and only so far in advance of pipe laying as the Engineer shall permit.

.2 The bottom of the pipe trench shall be excavated to a flat surface for the bedding material. Earth, boulders and rock shall be removed or excavated to provide a clearance of at least 150 mm below the pipe and the excavation for bedding of the pipe shall be refilled with thoroughly compacted material as specified herein.

3.3 DRAINAGE

.1 The Contractor shall keep all portions of the work properly and efficiently drained during construction and until completion. They shall be held responsible for all damage that may be caused as the result of water backing up or flowing over, though, from, or along any part of the work or surrounding properties due to their operation.

.2 All costs associated with providing drainage for the work as required, shall be included in the unit prices for the installation of mains and access vaults.

3.4 EXCAVATION AND PREPARATION OF TRENCH

.1 Excavation shall be taken to mean the removal from the trench of all materials of whatever kind encountered, for the laying of construction therein of all pressure mains, sewer mains, pre-fabricated maintenance holes, and appurtenances. All excavation shall be made exactly to line and grade, as shown on the drawings or as established by the Engineer. The length of trench which has not been backfilled shall not extend beyond one access vault to the rear of the working area. Excavation, pipe laying, and backfilling shall proceed at such a pace as to prevent permafrost degradation. It shall be braced and drained in a manner to ensure that work may proceed safely and efficiently therein.

.2 The trench shall be excavated to the depth shown on the drawings so as to provide a firm foundation for the pipe sand bedding on solid and undisturbed ground. Any part of the bottom of the trench excavated below the specified grade shall be corrected with approved backfill, thoroughly compacted as directed by the Engineer, with no extra cost to the Owner.

.3 Large rocks and boulders shall be removed to provide a clearance of at least 0.15 metres below and on each side of all insulation, pipe, maintenance holes and appurtenances. This is the minimum clear distance which will be permitted between any part of the pipe and appurtenances being laid and any part, projection or point of such rocks, boulders or stones. The subgrade shall be made by backfilling with an approved sand or gravel in 0.15 metre layers.

.4 These layers shall be thoroughly tamped as directed by the Engineer so as to provide a uniform and continuous bearing and support for the pipe bedding.

.5 Where the bottom of the trench at subgrade is found to be unstable due to material which, in the judgement of the Engineer, should be removed, the Contractor shall excavate and remove such unsuitable material to the depth determined by the Engineer.

.6 Ice rich soils shall be removed completely or to a maximum depth of 0.45 metres measured below the insulation of pipe lines.

.7 The cost of such additional excavation of unstable subgrade due to the presence of unsuitable materials, and backfill, ordered by the Engineer shall be paid for at the tendered unit price.

.8 The Contractor shall obtain the Engineer’s approval, in writing, of the trench or excavation preparation prior to placing pipe bedding, backfill, or structures in the trench or excavation.

.9 No extra payment shall be made for additional excavation and backfill that has become necessary due to subgrade that has become unstable due to water from melting snow and ice that has entered the trench. The trench must be kept dry; refer to Clause 3.13 “Water in Excavation”.

3.5 ROCK EXCAVATION

.1 Any boulders greater than 0.75 cubic metres in volume and any rock that cannot be excavated with a 0.5 cubic metre or larger trackmounted machine, or rock that requires blasting for its removal, will be paid for as rock. Volume of individual boulders will be

determined by measuring three mutually perpendicular dimensions. When rock is encountered. The Engineer must be notified at once, so that measurements can be made.

.2 Measurements for rock volume shall be taken from the top of the rock strata to the bottom of the strata. If the rock strata extends below the elevation of the invert of the pipe, then an allowance of 0.15 metres below the bottom of the pipe insulation will be used in calculating the volume of rock.

.3 Soft shale, soft sandstone, or other rock that can, in the opinion of the Engineer, be successfully excavated with a 0.5 cubic metre backhoe or equivalent without blasting and without unusual wear and tear to the machine will not be classified as “rock excavation”. Hardpan will not be classified as “rock excavation”. Frozen subgrade material or permafrost will not be classified as “rock excavation”.

3.6 BLASTING

.1 Use pre-shearing, cushion blasting or other smooth wall drilling and blasting techniques. The Contractor’s methods or procedure in blasting shall conform to Federal and Territorial laws and Municipal ordinances.

.2 Blasting for excavation will be permitted only after securing the approval of the local municipal authority and only when proper precautions have been taken or the protection of persons or property. The hours of blasting may be fixed by the local municipal authority. Any damage caused by blasting shall be repaired by the Contractor at his own expense. The Contractor will be responsible for obtaining permits required for blasting operations.

3.7 BRACING AND SHORING

.1 Bracing and shoring is the sole responsibility of the Contractor. Open-cut trenches shall be sheeted and braced as required by the Workers’ Compensation Board and Municipal ordinances, and as may be necessary to protect life, property, and work.

.2 When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting. The Engineer reserves the right to order the sheeting driven to the full depth of the trench or to such additional depths as may be required for the protection of the work. Where the soil in the lower limits of the trench has the necessary stability, the Engineer, at his discretion, may permit the Contractor to stop the driving of sheeting at some designated elevation above the trench bottom. The granting of permission by the Engineer, however, shall not relieve the Contractor in any degree from his fully responsibility under the contract. Sheeting and bracing, which have been ordered left in place, must be cut off and removed for a depth of one metre below the established road grade or the existing surface of the road, whichever is lower. Trench bracing, except that which must be left in place may be removed as the backfilling proceeds. Backfilling and withdrawal of sheeting shall proceed together; no voids shall be left in the trench by the withdrawal of sheeting. Sheeting shall not be driven any further below the bottom of the trench than is necessary to ensure proper support for the sheeting.

.3 The cost of furnishing, placing and removing the sheeting and bracing shall be included in the price bid for the work. When sheeting and bracing have been ordered left in place

by the Engineer, the payment for such material shall be as an extra at cost of the material, plus 20% and shall include the upper one metre of "cut-off" section of the sheeting.

3.8 TRENCHING BY HAND

.1 In any location where the use of trench digging machinery might cause property or utility damage the Contractor shall carry out the trenching by hand at no extra cost to the Owner.

3.9 TUNNELLING

.1 Tunnelling may be done with the approval of the Engineer and all shoring or grading necessary for the tunnel shall be left in place at the Contractor's expense. Before approval will be granted, the Engineer may require the Contractor to submit a statement and drawings indicating exactly the method of tunnelling which will be used. Backfilling must be carried out with approved materials and tamped with great care so as to leave the tunnel free of voids.

3.10 EXCAVATED MATERIAL

.1 All excavated material shall be piled into three piles:

.1 Suitable material that can be used for backfill

.2 Unsuitable material that cannot be used for backfill or other processes, and

.3 Frozen material. If upon inspection by the Engineer, the thawed material is deemed suitable for use as backfill, this material can be classified as suitable, otherwise the material will be classified as unsuitable.

.2 Unsuitable material shall be considered surplus material.

.3 Remove soil contaminated with calcium chloride, toxic materials, and petroleum products and legally dispose of at a location accepted by the Engineer.

.4 All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing roadways and driveways. Hydrants under pressure, access vaults and other utility controls shall be left unobstructed and accessible. Gutters and swales shall be kept clear or other satisfactory provisions made for roadway drainage, and natural watercourses shall not be obstructed.

.5 The earth taken from the trench shall be neatly deposited at the sides in such a manner as to obstruct the road or driveway as little as possible. When it is impractical, in the opinion of the Engineer, to place the earth at the side of the trench it shall be removed and deposited as designated by the Engineer. In either case, a clear space must be left on one side of the trench to accommodate the survey stakes.

Permafrost excavated from the trench shall not be stockpiled on top of material to be used as backfill. Materials which are unsatisfactory after permafrost has been stockpiled on top of it shall be considered contaminated and removed from the site by the Contractor. The Contractor shall be governed by

.6 Extra backfill material required because of the disposal of material contaminated by permafrost shall be supplied, placed, and compacted by the Contractor at his expense; see

Clause 3.14 “Backfilling”, for specifications on the approved backfill materials and methods.

3.11 OWNERSHIP OF EXCAVATED MATERIAL

.1 Surplus earth and other excavated materials will remain the property of the Owner.

.2 All surplus or other material of any kind arising from, or during the construction of the works or any portion thereof which belongs to the Owner shall not be sold, thrown away, dumped, wasted or otherwise disposed of, except as directed by the Engineer. If so disposed of by the Contractor, the Engineer shall ascertain, as nearly as they can, the quantity and value thereof, and shall direct the Contractor or his sureties to pay unto the Owner the amount thus found, or the Owner may deduct it from any subsequent progress claim.

3.12 CLEANING UP AND DISPOSAL OF SURPLUS EXCAVATED MATERIAL

.1 All surplus and excess materials that arise out of the construction of the works shall be removed and neatly piled, evenly spread or deposited as directed by the Engineer. The entire expense of loading, hauling, unloading, piling, spreading or otherwise dealing with said waste material shall be borne by the Contractor. If any material is dropped or spilled it shall be promptly removed to the satisfaction of the Engineer.

3.13 WATER IN EXCAVATION

.1 All water pumped or drained from the work shall be disposed of in a suitable manner satisfactory to the Engineer, without damage to the Construction work of other property, structures, or persons.

.2 The expense of removing the water, regardless of origin, is the responsibility of the Contractor. The Contractor shall be wholly responsible for any damage that may occur due to ground water or storm water entering the trench during the period of construction.

.3 No extra payment shall be made for additional excavation and backfill that is required due to subgrade that has become unstable due to water from any source.

3.14 BACKFILLING

.1 Trench excavations shall be backfilled with materials taken from the excavations, if in the opinion of the Engineer, they are suitable for use as compacted backfill. Otherwise Granular “B” or backfill approved by the Engineer shall be supplied by the Contractor as backfill.

.2 All backfill shall be mechanically compacted in even layers not exceeding 0.15 metres in thickness so that there is no subsequent subsidence in the trench. The backfill shall be compacted to a density of 95% of the maximum density at optimum moisture content as determined by the Standard Proctor Test as per ASTM D698-12(2021). Edges of existing pavement shall be cut square with an asphalt saw or compressor and all irregularities removed. Prior to placing asphalt, the edges of the existing pavement shall be swept clean. Pavement shall be replaced for the full damaged or removed width. Paved areas will be replaced with asphalt unless asphalt is unavailable. If asphalt is unavailable, the

paving will be postponed to the subsequent year. The Contractor shall provide daily compaction test results to the Engineer.

.3 In open field areas upon completion of all trenching and backfill, the entire disturbed area shall be bladed level.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 23 16.26 – Rock Removal

.2 Section 31 23 33.01 – Excavating Trenching and Backfilling

.3 Section 32 11 16.01 – Granular Sub-Base

.4 Section 32 11 23 – Aggregate Base Courses

1.2 MEASUREMENT PROCEDURES

.1 General:

.1 Volumes shall be measured in cubic metres and determined from survey cross-sections taken by the Engineer before work is commenced and after the work has been completed.

.2 Under no circumstances shall any excavated material be sold or otherwise disposed of by the Contractor, Sub-Contractors or any of their employees. Excavated material from a gravel base area may be used as base gravel materials for fills or embankments providing the use of such material has first been approved, in writing, by the Engineer.

.3 Contractor shall submit information as required by Section 01 33 00 – Submittal Procedures.

.2 Common Excavation:

.1 To be measured in cubic metres calculated from cross sections taken by the Engineer in areas of excavation.

.2 Initial cross sections to be taken by the Engineer after necessary clearing, grubbing and stripping, and immediately prior to excavation of material to be incorporated into work.

.3 The contract unit price per cubic metre shall be compensation in full for all labor, materials and equipment necessary to excavate, load, haul and dump the material at the designated disposal or stockpile site, and all other work necessary and incidental thereto for which separate payment is not elsewhere provided.

.4 The Contractor shall stockpile approved, excavated granular material for re-use as embankment or backfill material. This may require double handling and/or hauling from one site to another. No additional payment will be made for double handling and/or hauling from one site to another.

.5 The Contractor shall notify the Engineer two business days in advance of the excavation to allow for the measurement of cross sections. If the excavation is backfilled before measurement the Contractor shall forfeit payment for the work.

.3 50 mm Minus Road Base and 20 mm Minus Road Base will be measured and paid at the material Contract Unit Price. Price shall include full compensation for supply of material, placing, grading, watering, compacting, trimming, incidentals and all other work necessary to complete the installation.

.4 Ditching will be measured and paid for at the material Contract Unit Price. The unit price shall include full compensation for the improvement and upgrade of existing ditching.

.5 Geotextile will be measured in square metre of surface covered. Area of overlapping material will not be doubled, overlaps will be considered incidental to the work. The unit price shall include supply, installation, labor and tooling required to install geotextile material.

.6 No separate payment for:

.1 Excavating unnecessarily beyond lines established by Engineer.

.2 Removing and disposing of roots, stumps and other materials excavated during waste operation.

.3 Removing unsuitable material from embankment attributable to Contractor's negligence.

.4 Watering, drying and compacting.

.5 Finishing.

.6 Clearing, grubbing and stripping topsoil.

.7 Proofrolling.

.8 Cellular concrete preparation and coordination.

.9 Maintenance.

1.3 REFERENCES

.1 ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/mn).

1.4 DEFINITIONS

.1 Common Excavation: excavation of materials that are not Rock Excavation or Stripping.

.2 Free Haul: N/A.

.3 Stripping: excavation of organic material covering original ground.

.4 Over Haul: N/A

.5 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements.

.6 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.7 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of one cubic metre (1 m^3).

.8 Embankment: material derived from borrow sources and placed above original ground or stripped surface up to subgrade elevation.

.9 Subgrade elevation: elevation at base of 50 mm minus road gravel material.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

.1 Adhere to regulations of authority having jurisdiction if blasting is required.

.2 Adhere to Territorial and National Environmental requirements if potentially toxic materials are involved.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Embankment materials require approval by Engineer.

.2 Granular material to meet the requirements of Section 32 11 16.01 Granular Sub Base

.3 Geotextile to be non-woven material:

.1 Min Thickness: 40 mils

.2 Min Tensile Strength: 450 N

PART 3 EXECUTION

3.1 TRAFFIC PROVISIONS

.1 Provide and maintain roadways, walkways and detours, for vehicular and pedestrian traffic and access to fire hydrants in service.

.2 See Section 01 55 26 - Traffic Control.

3.2 BURIED SERVICES

.1 Check with utility authorities to locate or advise regarding buried pipes, cables, ducts or services. The Contractor shall pay for repairs to services damaged during excavation.

3.3 COMPACTION EQUIPMENT

.1 Compaction equipment must be capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.

3.4 WATER DISTRIBUTORS

.1 Apply water with equipment capable of uniform distribution. Distributors must have shut-off capability.

.2 The Contractor should have water available for compaction purposes at all times.

3.5 STRIPPING OF TOPSOIL

.1 Commence topsoil stripping of areas as directed by the Engineer. Complete all stripping before any excavation is begun.

.2 Strip topsoil to depths as directed by the Engineer. Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by the Engineer.

.4 Dispose of unused topsoil to where directed by the Engineer.

.5 Remove clearing and grubbing debris from stripping material. Grub out stumps, roots rubbish and other non-perishable material over 50 mm to a minimum depth of 550 mm below indicated finish grade from cleared areas. Remove embedded rocks less than 0.25 cubic metres encountered during clearing operation.

.6 Where directed by the Engineer, upon completion of excavation and embankment construction spread organic stripping on slopes and trim.

3.6 EXCAVATING

.1 General:

.1 Notify Engineer whenever waste materials are encountered and remove to depth and extent directed. Dispose of waste material as directed.

.2 Where subgrade is on transition from excavation to embankment, treat ground slopes at grade points as directed by Engineer.

.3 Advise Engineer in advance of excavation operations to allow for initial cross sections to be taken.

.2 Drainage:

.1 Maintain profiles, crowns and cross slopes to provide good surface drainage.

.2 Provide ditches as work progresses to provide drainage.

.3 Construct interceptor ditches as shown on plans or as directed before excavating or placing embankment in adjacent area.

.3 Rock excavation:

.1 If, during excavation, material appearing to conform to classification for rock is encountered, notify the Engineer and provide sufficient time to enable measurements to be made to determine volume of rock.

.2 Shatter rock to 300 mm below subgrade elevation as indicated on plans.

.3 Scale rock backslopes to achieve smooth, stable face, free of loose rock and overhangs to design backslope.

.4 Control blasting to minimize flying particles.

.4 Borrow Excavation:

.1 Completely use in embankments, suitable materials removed from right-of-way excavations before taking material from borrow areas.

.2 Obtain embankment materials in excess of what is available from cut areas from designated borrow areas:

.1 Notify the Engineer of the source of borrow material.

3.7 EMBANKMENTS

.1 When directed, scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of Engineer.

.2 Break up or scarify existing road surface prior to placing embankment material.

.3 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized.

.4 Maintain crowned surface during construction to ensure ready run-off of surface water.

.5 Drain low areas before placing materials:

.1 Place and compact to full width in layers not exceeding 300 mm loose thickness. The Engineer may authorize thicker lifts if specified compaction can be achieved.

.6 Where material consists of rock:

.1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 300 mm.

.2 Carefully distribute rock material to fill voids with smaller fragments to form compact mass.

.3 Fill surface voids at subgrade level with rock spalls or selected material to form an earth-tight surface.

.4 Do not place boulders and rock fragments with dimensions exceeding 150 mm within 500 mm of pavement subgrade elevation.

.7 Deductions from excavation will be made for overbuild of embankments.

3.8 PLACING

.1 Place material only on a clean surface, properly shaped, compacted and free from snow or ice.

.2 Place granular embankment or granular base and surfacing materials using methods which do not lead to segregation or degradation.

.3 Remove and replace portion of a layer in which material has segregated during spreading.

.4 Where ordered, placed filter cloth on the prepared base of excavation areas.

.5 Lifts are not to exceed 300 mm unless otherwise approved by the Engineer.

3.9 COMPACTION REQUIREMENTS

.1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.

.2 Compact subgrade (native material, pitrun) layer to a minimum of 95% maximum dry density, ASTM D 698.

.3 Compact subbase layer (50 mm minus) to a minimum of 98% maximum dry density, ASTM D 698.

.4 Compact base layer for roads and sidewalks (20 mm Minus) to a minimum of 100% maximum dry density, ASTM D 698.

.5 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction. All compacted backfill materials should be moisture conditioned prior to compaction to achieve +/- 2% of the optimum moisture content for that material.

.6 Shape and roll alternatively to obtain a smooth, even and uniformly compacted sub-base.

.7 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.10 INSPECTION OF SUBGRADE & BASE

.1 Do not place 50 mm minus road gravel subbase until finished subgrade is inspected and approved by the Engineer.

.2 Do not place 20 mm minus road gravel base until finished subbase is inspected and approved by the Engineer.

.3 Failure to allow for inspection by the Engineer will result in the forfeiture of payment.

.4 The Contractor is responsible for ensuring that the testing required by Section 01 45 00 - Quality Control has been completed.

3.11 FINISHING

.1 Finish slopes and ditch bottoms to neat condition, true to lines, grades and drawings where applicable. For cut slopes in bedrock steeper than 1:1, scale slope by removing loose fragments.

.2 Shape subgrade surface to within +/- 25 mm of the design elevations.

.3 Shape base course surface to within +/- 10 mm of the design elevations.

.4 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.5 Remove rocks over 150 mm in any dimension from slopes and ditch bottoms. Fill resulting cavities with material approved by the Engineer.

.6 Hand finish slopes that cannot be finished satisfactorily by machine.

.7 Trim between constructed slopes and edge of clearing to provide drainage and free of humps, sags and ruts.

3.12 PROTECTION & MAINTENANCE

.1 Maintain finished surfaces in condition conforming to this section until acceptance by the Engineer.

.2 Maintain gravel ramps at all connections of gravel roadways to existing asphaltic concrete.

.3 Include as maintenance, restoration of gravel roadways following thawing of any trenches backfilled under freezing conditions, or any other settlements. Windrow surfacing gravel to one side, place and compact granular base material, replace and recompact surfacing material. Carry out when ordered by the Engineer and repair operation as necessary.

3.13 PROOF ROLLING

.1 Proof roll top of base upon completion of final grading and compaction, where directed by the Engineer.

.2 For proof rolling use a heavily-loaded truck having a minimum static weight of 10 tonnes per axle.

.3 Ground speed of 4 to 8 km/hour.

.4 Make sufficient passes with proof roller to subject every point on surface to two (2) separate passes of loaded tire.

.5 Where proof rolling reveals areas of defective subgrade:

.1 Remove base, sub-base and subgrade material to depth and extent directed by the Engineer.

.2 Backfill excavated subgrade with approved common material and compact in accordance with this section.

.3 Replace subbase material and compact in accordance with this Section.

.4 Replace base material and compact in accordance with this Section.

.5 Repeat proof roll.

.6 This work is to be completed at the expense of the Contractor.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

.1 This specification outlines the requirements for supply and installation of baskets fabricated from wire mesh and filled with stone. A gabion structure consists of a number of baskets placed and wired together so that joints between baskets are as strong as the wire mesh, making a monolithic structure.

1.2 MEASUREMENT FOR PAYMENT

.1 Gabions of the size and type specified will be measured in cubic metres of stone filled wire mesh baskets incorporated into the work based on the nominal dimensions of the gabion units used.

.2 Measurement for the volume of the gabion structure shall be the sum of the volumes of the individual rows of gabions. The volume of a row of gabions shall be calculated as the product of: the mean length of a row, times the mean height of the row measured along the face of the row, times the mean depth of the row measured perpendicularly to the exposed face.

.3 Only gabions placed within specified lines and grades will be measured for payment.

.4 Where excavation required for gabions overlaps excavation required for the other work, then payment for excavation will be made in accordance with the specification for the other work as though no excavation required for gabions.

.5 Mass excavation and backfill will be paid in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.3 RELATED REQUIREMENTS

.1 Section 01 29 00 – Payment Procedures.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 35 29.06 – Health and Safety Requirements.

.4 Section 01 45 00 – Quality Control.

.5 Section 01 61 00 – Common Product Requirements.

.6 Section 01 78 00 – Closeout Submittals.

.7 Section 31 05 16 – Aggregates for Earthworks.

.8 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Gabion baskets:

.1 Fabricated so that sides, ends, lid and internal diaphragms readily assemble at site into rectangular baskets of sizes indicated.

.2 Single unit construction or with joints having strength and flexibility equal to that of mesh.

.3 When the length exceeds horizontal width, provide diaphragms of same mesh as gabion walls to divide basket into equal cells of a length not in excess of horizontal width.

.4 Wire mesh to be uniform pattern wire woven in a triple twist pattern or welded wire with openings of approximately not greater than 80 x 100 mm and fabricated to be non-ravelling. Perimeter edges of mesh to be securely selvedged so that joints formed by tying selvedges are as strong as body of mesh.

.5 Wire to have the following mechanical properties:

Wire for mesh (minimum):	2.70mm diameter
Wire for selvedges (minimum):	3.40mm diameter
Wire for binding (minimum):	2.20mm diameter
Minimum tensile:	415MPa strength
Minimum elongation:	10%

.6 Wire: Zinc coated soft or medium temper steel in accordance with ASTM A975, style 3 coating with a high abrasion resistant polymer coating with a nominal thickness of 0.50mm. Standard of acceptance: Maccaferri mesh type 8x10, wire diameter 2.70mm, with PoliMac coating.

.2 Stone fill:

.1 Stone to be hard, durable and abrasion resistant and such that it will not disintegrate from action of wetting and drying, wave action, freezing and thawing cycles.

.2 Stone to be minimum 100mm to maximum 200mm dimension unless otherwise specified.

.3 Geotextile:

.1 Nonwoven geotextile. Standard of acceptance: Maccaferri Mactex MX225 or approved equal.

2.2 PRODUCTION

.1 Gabions shall be so fabricated that the sides, ends, lid, base and diaphragms can be readily assembled at the construction site into rectangular baskets of the specified sizes. Gabions shall have all components interconnected in such a manner that the strength and flexibility at the point of connection is at least equal to that of the mesh.

.2 Where the length of the gabion exceeds its horizontal width, the gabion shall be divided by diaphragms, of the same mesh and thickness of steel wire as the body of the gabion, into equal cells whose length does not exceed the horizontal width. Diaphragms shall be secured in the proper position on the base section such that no additional tying will be required at this juncture.

.3 Gabions and gabion mats shall be supplied in the sizes and to dimensions indicated in the contract documents.

2.3 CERTIFICATION

.1 Gabions shall be accompanied by a certified report of tests showing that the products to be supplied meet the requirements of this specification, and by a statement of the system to be used identifying the various sizes of gabions to be supplied.

.2 These requirements may be waived for subsequent supply, provided the supplier certifies that the gabions to be furnished are of the same specific material and manufactured as that covered by a certified report of the tests previously submitted and approved.

2.4 INSPECTION AND TESTING

.1 Notwithstanding the acceptance of certification, the authority reserves the right to make inspections and tests, and at such times the Engineer may consider necessary to ensure that the materials supplied are in accordance with this specification.

.2 All materials failing to comply with the requirements of this specification shall be rejected.

.3 Rejection shall constitute automatic withdrawal of the Engineer's approval. Applications for re-approval shall be substantiated by an up-to-date test report as required for certification.

2.5 SHIPPING AND MARKING

.1 Gabions shall be shipped folded flat in bundles each containing a uniform number of one size only, except as necessary to complete an order, and weighing not more than 230 kg.

.2 Bundles shall be clearly marked to show the size and number of gabions. In addition, each gabion shall be clearly coloured coded, or otherwise suitably identified, to indicate the size.

.3 Gabion mats shall be shipped in rolls of 30m long, 2 or 3m wide with ends, sides and dividers attached to base.

PART 3 EXECUTION

3.1 SITE PREPERATION

.1 All stumps, roots, debris, and loose boulders in excess of 100mm in maximum dimension shall be removed and disposed off the right-of-way prior to placing gabions. The necessary grading and excavation for gabion structures shall be carried out to such lines and grades as indicated in the contract and as required to provide a smooth, uniform gradient.

3.2 INSTALLATION

.1 Install gabions to lines and grades indicated or as directed by Engineer.

.2 The foundation shall be excavated to an even finish and to the required grade.

.3 The Contractor shall assemble gabions according to the manufacturer recommendations.

.4 The Contractor shall unfold each gabion to the open position. The four corner edges shall be wired to secure the gabion shape. The edges of the diaphragms shall be wired to the gabion walls in the correct position.

.5 Each assembled gabion shall be securely wired to the adjacent gabions along the top and the vertical edges prior to placing of stone.

.6 In assembling individual units, the selvedges at the corners shall be bound together and the selvedges of diaphragms shall be bound directly to the fabric with binding wire. The binding wire, throughout the length of the selvedged, shall be tightly lopped around every other mesh opening in such a manner that single and double loops are alternated. Loops shall be separated by a distance not greater than 100mm.

.7 To achieve better alignment and finish, the contractor shall stretch gabions before filling.

.8 Where gabion units are grouped together in whatever configuration is called for in the contract, each unit shall be secured to adjoining units by binding along and throughout the length of each contacting selvedged edge, in a manner similar to that described for assembling individual units.

.9 Gabions shall be assembled so as to leave no wire ends projecting outside the basket on any exposed surface.

3.3 FILLING BASKETS

.1 On exposed faces of gabions, place stones by hand with flattest surfaces bearing against face mesh to produce a satisfactory alignment and appearance. The remaining rock is to be placed randomly by hand.

.2 After the first gabion in a row has been filled to provide the necessary weight, the remaining rock shall be placed only after the baskets have been stretched taut by means of a standard fence stretcher or by other means approved by the Engineer and adjusted to proper alignment. Four or five gabions in a row may be stretched simultaneously.

.3 In order to prevent local deformation, when 0.91m gabions or 0.46m gabions are placed in rows, they shall be filled in stages. When the first basket has been filled, the second shall have been filled two-thirds of its depth and the third basket shall have been filled to one-third of its depth.

.4 Fill basket cells in lifts of 300mm and connect opposite walls with 2 tie wires after each lift.

3.4 PLACING OF CONNECTING WIRES

.1 When a gabion has been filled to a depth of 0.23m in the case of 0.46m gabions or to a depth of 0.30m in a the case of 0.91m gabions, 2 horizontal connecting wires, one in each direction, shall be placed. In the case of 0.91m gabions, an additional horizontal connecting wire shall be placed in each direction at the end 0.60m mark when the basket has been two-thirds filled. Connecting wires shall be looped around 2 adjoining mesh openings and shall be pulled hand tight.

.2 Where 0.46m depth gabions are used for channelling or revetment, connecting wires are not necessary.

3.5 PLACING GABIONS

.1 Place baskets in position prior to filling with stones.

.2 Wire adjacent baskets together at corners so that joints are as strong as mesh.

.3 For underwater placement, gabions may be prefilled. Provide special devices to handle filled baskets without distortion and to place gabions in position. Connect adjacent basket together when in place using a diver.

3.6 SECURING LIDS

.1 When the basket has been filled, the lid shall be bent over by hand and with the use of a pinch bar, if necessary, inserted at intervals between the selvedges of the lid and the selvedges of the top and sides. The lid shall be pulled until the selvedges coincide and shall be secured to the front and ends by binding wire in a manner in accordance with subsection 3.1 of this specification.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

.1 The work covered by this section includes placement of rip-rap stone as required elsewhere or as required.

1.2 RELATED REQUIREMENTS

.1 Section 01 29 00 – Payment Procedures.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 35 29.06 – Health and Safety Requirements.

.4 Section 01 45 00 – Quality Control.

.5 Section 01 61 00 – Common Product Requirements.

.6 Section 01 78 00 – Closeout Submittals.

.7 Section 31 05 16 – Aggregates for Earthworks.

.8 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.9 Section 33 42 13 – Pipe Culverts.

PART 2 PRODUCTS

2.1 STONE

.1 Rip-rap stone to meet the requirements as set out in Section 31 05 16 – Aggregates for Earthworks.

PART 3 EXECUTION

3.1 PLACING

.1 Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.

.2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.3 Place rip-rap to thickness and details as indicated.

.4 Place stones in a manner approved by Engineer to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.5 Hand placing:

.1 Use larger stones for lower courses and as headers for subsequent courses.

.2 Stagger vertical joints and fill voids with rock spalls or cobbles.

.3 Finish surface even, free of large openings and neat in appearance.

.6 Where required, install a geotextile filter fabric on a firm, compacted bed as recommended by the manufacturer. Place rip-rap in such a manner as to avoid damage to geotextile filter fabric.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.6 ASTM D1557-09, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.7 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.8 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Granular sub-base material: in accordance with the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to [ASTM C136] and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

.3 Table

ASTM Sieve Designation	% Passing			
	Granular A	Granular B	Granular C	Modified Granular C
200mm	-	-	100	-
100mm	-	100	-	-
75mm	-	95-100	-	-
50mm	-	-	-	-
38.1mm	-	-	-	-
25mm	100	45-100	50-100	-
19mm	85-100	-	-	-
12.5mm	65-90	-	-	-
9.5mm	50-73	-	-	100
4.75mm	35-55	25-70	20-100	55-100
1.8mm	15-40	-	10-100	30-100
0.425mm	-	4-50	-	-
0.300mm	5-22	-	2-65	10-50
0.075mm	2-8	0-8	0-8	0-10

.1 Gradations to be within the limits specified when tested to ASTM C136-84a and ASTM c117-84 and are to have a smooth Curve without any sharp breaks when plotted on a semi-log gradient chart.

.2 Granular A and Granular B to be crushed stone or Crushed Gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.3 Granular C to be crushed stone or gravel or screened stone or gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.4 Modified Granular C to be crushed stone or gravel or screened stone, gravel or sand and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials

.4 Other properties as follows:

.1 Liquid Limit: to ASTM D4318, Maximum 25.

.2 Plasticity Index: to ASTM D4318, Maximum 6.

PART 3 EXECUTION

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place granular sub-base materials using methods which do not lead to segregation or degradation.

.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities. For compaction below new asphalt, a single drum vibratory roller is required.

.2 Compact to density of not less than 98% maximum dry density in accordance with ASTM D698.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 32 11 16.01 – Granular Sub-base.

.2 Section 32 11 23 – Aggregate Base Courses.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

- .1 ASTM C131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .2 ASTM C136, Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m^3).
- .4 ASTM D4318, Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB-8., Sieves Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2, Sieves Testing, Woven Wire, Metric.

.3 All references to be latest revision.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Granular base material: to Section 31 05 16 – Aggregates for Earthworks and following requirements:

- .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material and other deleterious materials.
- .2 Gradation to: NSTIR Type 1
- .3 Other properties as follows:
  - .1 Liquid limit: ASTM D4318, maximum 25.
  - .2 Plasticity index: ASTM D4318, maximum 6.
  - .3 Crushed particles: at least 50 % of particles by mass within 19.0 mm to 4.75 mm sieve designation range to have at least 1 freshly fractured face. Material divided into ranges using methods of ASTM C136.

PART 3 EXECUTION

3.1 SEQUENCE OF OPERATION

.1 Scarifying and reshaping:

.1 Scarify roadbed to width as indicated unless directed otherwise by Consultant and to minimum depth of 150 mm.

.2 Pulverize and break down scarified material to 25 mm maximum particle size.

.3 Blade and trim pulverized material to elevation and cross section dimensions as indicated unless directed otherwise by Consultant.

.4 Where deficiency of material exists, add and blend in new granular base material as directed by Consultant. Ensure no frozen material is used.

.2 Compaction equipment:

.1 Compaction equipment capable of obtaining required material densities.

.3 Compacting:

.1 Compact to density minimum 100% corrected maximum dry density.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compaction to obtain specified density.

.4 Use mechanical tampers, approved by Consultant to compact areas not accessible to rolling equipment to specified density.

.4 Repair of soft areas:

.1 Correct soft areas by removing defective material to depth and extent directed by Consultant. Replace with material acceptable to the Consultant and compact to specified density.

.2 Maintain reshaped surface in condition conforming to this section until succeeding material is applied or until acceptance by Consultant.

3.2 SITE TOLERANCES

.1 Reshaped compacted surface within plus or minus 25 mm of elevation as indicated.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 ASTM International

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Granular base: material in accordance with the following requirements:

.1 Crushed stone or gravel.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

.1 Gradation

ASTM Sieve Designation	% Passing			
	Granular A	Granular B	Granular C	Modified Granular C
200mm	-	-	100	-
100mm	-	100	-	-
75mm	-	95-100	-	-
50mm	-	-	-	-
38.1mm	-	-	-	-
25mm	100	45-100	50-100	-
19mm	85-100	-	-	-
12.5mm	65-90	-	-	-
9.5mm	50-73	-	-	100
4.75mm	35-55	25-70	20-100	55-100
1.8mm	15-40	-	10-100	30-100
0.425mm	-	4-50	-	-
0.300mm	5-22	-	2-65	10-50
0.075mm	2-8	0-8	0-8	0-10

.2 Gradations to be within the limits specified when tested to ASTM C136-84a and ASTM c117-84 and are to have a smooth Curve without any sharp breaks when plotted on a semi-log gradient chart.

.3 Granular A and Granular B to be crushed stone or Crushed Gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.4 Granular C to be crushed stone or gravel or screened stone or gravel and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials.

.5 Modified Granular C to be crushed stone or gravel or screened stone, gravel or sand and shall be free of clay lumps, cementation, organic material, frozen material, and other deleterious materials

.6 Liquid limit: to ASTM D4318, maximum 25

.7 Plasticity index: to ASTM D4318, maximum 6.

.8 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 45

.9 Soaked CBR: to ASTM D1883, minimum 100, when compacted to 100% of ASTM D1557.

PART 3 EXECUTION

3.1 PLACEMENT AND INSTALLATION

.1 Place granular base after sub-base surface is inspected and approved in writing by Departmental Representative.

.2 Placing:

.1 Construct granular base to depth and grade in areas indicated.

.2 Ensure no frozen material is placed.

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 Place material using methods which do not lead to segregation or degradation of aggregate.

.5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.7 Remove and replace that portion of layer in which material becomes segregated during spreading.

.3 Compaction Equipment:

.1 Ensure compaction equipment is capable of obtaining required material densities. For compaction below new asphalt, a single drum vibratory roller is required.

.4 Compacting:

.1 Compact to density not less than 100% maximum dry density to ASTM D698.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compacting to obtain specified density.

.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.

.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

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

3.3 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This section refers to the construction of asphalt mix.

1.2 RELATED REQUIREMENTS

.1 Section 01 20 00 – Measurement and Payment.

.2 Section 01 29 83 – Testing and Laboratory Services.

.3 Section 01 33 00 – Submittal Procedures.

.4 Section 01 35 30 – Health and Safety Requirements.

.5 Section 01 45 00 – Quality Control.

.6 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.7 Section 32 11 23 – Aggregate Base Courses.

1.3 WORK INCLUDED

.1 Repair bituminous prime coat or curing seal on previously constructed base course and broom as required.

.2 Supply, haul, store and process aggregate and bituminous materials.

.3 Mix, spread, and compact asphalt mix material.

.4 It is the Contractor's sole responsibility to select and provide equipment that will ensure that the asphalt mix can be properly produced, transported, spread and compacted in a manner that will ensure the material meets the requirements of this specification.

1.4 MEASUREMENT FOR PAYMENT

.1 Prime Coat

.1 The use of prime coat is at the sole discretion of the Contractor. No payment will be made for the application of any prime coat.

.2 Tack Coat

.1 No payment will be made for the application of tack coat to the edge or surface of existing pavement or to the exposed face of any structure. It is considered incidental to the work. Failure to adequately tack surfaces will result in a 5 percent reduction in the asphalt unit price.

.3 Hot Mix Asphaltic Concrete Pavement

.1 The Contractor must prove that the asphalt mix produced meets this specification through QC testing.

.2 The Contractor must obtain written approval from the Owner before commencing with asphalt placement in any of the major areas of the work.

.3 Payment Per Square Metre:

.1 The quantity of asphalt mix for which payment will be made, shall be the actual number of square metres of accepted asphalt surface course of

each type of mix indicated in the Tender Form measured in place. It shall be paid for at the contract unit price bid per square metre based on the Engineer's field measurement made along the centreline of the roadway for the required width and specified compacted depth.

.2 This price and payment shall be compensation in full for preparation of mix design and job mix formula; for quality control testing; for supplying, crushing and hauling aggregates; for supplying and mixing asphalt binder with the aggregate in amounts called for in the mix design; for laying and compacting the asphalt mixture; for sweeping and for all equipment, labour, tools and incidentals necessary to complete the item.

.4 Payment Per Tonnage

.1 This payment item will be for overlays and be measured in metric tonnes of material. Contractor to provide haul tickets within 7 days of asphalt installation. It shall be paid for at the contract unit price bid per tonne.

.2 This price and payment shall be compensation in full for preparation of mix design and job mix formula; for quality control testing; for supplying, crushing and hauling aggregates; for Hamlet of Rankin Inlet supplying and mixing asphalt binder with the aggregate in amounts called for in the mix design; for laying and compacting the asphalt mixture; for sweeping and for all equipment, labour, tools and incidentals necessary to complete the item in accordance with these specifications.

.5 Thickness Tolerance:

.1 Payment reductions shall apply to those areas found to be deficient in thickness unless other corrective actions taken by the Contractor are approved by the Engineer. Payment reductions for deficient thickness shall be applied in accordance with the following conditions.

.2 The minimum compacted thickness of hot mix shall be placed on all areas unless specified otherwise. Pavement structure shall be constructed to the minimum thickness specified. Pavement deficient in thickness by 13 mm or more shall be removed and replaced at the Contractor's expense. For pavement found deficient by more than 3 mm but less than 13 mm, the adjusted unit rate shall have the same ratio to the contract unit price that the square of the average thickness found has to the square of the specified thickness. No adjustments will be made for thickness greater than specified.

.6 Density:

.1 The mixture shall be compacted immediately after spreading to a minimum density required by the asphalt mix design. Asphalt which fails to meet the density specified shall be removed and replaced at the Contractor's expense or a reduced payment may be substituted, as follows:

% of 75 Blow Marshall Density	% Payment Reduction
Minimum and above	0
96.0 - 96.9 (if min 97%)	5
95.0 - 95.9	20
94.5 - 94.9	60
Below 94.5	Replace

.7 Quality Control testing will not be measured separately for payment. It is considered incidental to the work.

.8 Project average asphalt cement content deviating from design value shall result in the following value adjustment.

Unit Price Adjustment for Asphalt Content		
Deviation of the Actual Asphalt Content from the Approved Asphalt Content	**Unit Price Adjustment for Asphalt Content PAa $ per tonne**	
	Below	Above
From 0 to 0.30	0.00	0.00
From 0.31 to 0.35	-1.10	-0.90
From 0.36 to 0.40	-2.20	-1.80
From 0.41 to 0.45	-3.30	-2.70
From 0.46 to 0.50	-4.40	-3.60
For deviations of more than 0.50% the Contractor shall either overlay or remove and replace the previously placed mix.		

PART 2 PRODUCTS

2.1 BITUMINOUS MATERIALS

.1 Asphalt Cement:

.1 The asphalt cement shall be AC200-300(A), uniform in character, free of water and shall not foam when heated to 175C. It shall meet the following specifications:

	Aashto Test Method	Astm Test Method	Specification
Viscosity at 60°C Pa.s		D2171	45+
Viscosity at 135°C mm /s			200 +
Penetration, 0°C, 200 g, 60 sec.			40+
Penetration, 25°C, 100 g, 5 sec.			200-300

	Aashto Test Method	Astm Test Method	Specification
Flash point (Cleveland open cup °C)	T48	D92	177+
Thin Film oven test	T179	D1754	
Penetration after test. 25°C, 100 g, 5 sec. % of original	T49	D5	50+
Ductility at 15.6°C	T51	D113	150+
Solubility in Trichloro - ethylene %	T44	D2042	99+
Test on residue after thin film oven test. Viscosity at 60°C Pa.s			Max 50
Ductility at 25°C CMS			100+

.2 Asphalt Tack Coats: The tack coat shall be a liquid asphalt of the following type and grade:

Emulsified Asphalt - SS-1 or SS-1h

Cutback Asphalt - RC-30, RC-70, or RC-250

.3 Asphalt Seal Coats and Fog Coats: The seal coat and fog coat shall be a liquid asphalt of the following type and grade:

Emulsified Asphalt - SS-1 or SS-1h or

Cutback Asphalt - MC-30, MC-70, RC-30, RC-70 or RC-250

.4 Asphalt Prime Coat Asphalt prime coat shall be a liquid asphalt of the following type and grade:

Emulsified Asphalt - SS-1 or SS-1h

Cutback Asphalt - MC-30, MC-70, or MC-250

2.2 AGGREGATE SOURCES

.1 Source of aggregate selected and method of achieving an acceptable gradation must be approved by the Engineer.

2.3 MINERAL AGGREGATE

.1 The Contractor shall be responsible for the acquisition of aggregates and access to the aggregate source.

.2 All aggregate particles shall be composed of sound, hard, durable particles of sand, gravel and rock and shall be free from elongated particles, injurious quantities of flaky particles, soft shales, organic matter, clay lumps and other foreign matter.

.3 When tested by means of laboratory screens, the mixed aggregate shall meet the following gradation limitations:

Sieve Size	12.5 mm Asphalt mix
20 mm	
12.5 mm	100
10 mm	83-92
5 mm	55-70
1.25 mm	26-45
630 um	18-38
315 um	12-30
160 um	8-20
80 um	2-8

.1 Tolerances:

The job mix gradation shall be maintained within the requirements listed above which are the master range of tolerances and shall govern over any other tolerances prescribed.

Allowable variations in aggregate gradation:

± 3 percent on material retained on the 160 micron sieve and coarser.

± 1 percent on material retained on the 80 micron sieve.

Maximum allowable variation in asphalt cement contents:

± 0.3 percent of the design mix within a test lot.

.2 Failure to meet gradations:

Should the Contractor choose to produce an asphalt mix design with an aggregate gradation that does not fall within these limits, the Contractor shall provide a letter stamped by a Professional Engineer registered in Nunavut which indicates that the revised design gradation will meet or exceed the performance requirements of the Hamlet of Rankin Inlet. Failure to do so will result in the removal and replacement of any placed Hot Mix with an asphalt that meets the requirements of this specification at the Contractor's expense.

.4 Coarse aggregate is all material retained on the 5.00 mm sieve size. This aggregate shall consist of sound crushed stone, crushed gravel, or combinations of these materials. At least 70% of the coarse aggregate shall have at least two (2) fractured faces.

The percentage of wear of coarse aggregate used in surface course mixes shall not be greater than 40% when tested by ASTM C131 for heavy duty pavements.

Coarse aggregates shall be tested for soundness by ASTM C131 for heavy duty pavements.

Coarse aggregates shall be tested for soundness by ASTM C88 or will be satisfactorily proved sound through adequate record of service. When tested for soundness, the number of cycles shall be five (5), the solution shall be sodium sulphate, and the maximum loss shall be 12%. Aggregates having known polishing characteristics shall not be used in mixes for the surface course.

.5 When coarse aggregate grading is such that the material will tend to segregate in stockpiling or handling, such aggregate shall be supplied in two (2) or more sizes. Each size of coarse aggregate required to produce the combined gradation specified above shall be placed in individual stockpiles satisfactory to the Engineer. When it is necessary to

blend two or more coarse aggregates before placing them in the cold bins, the blending shall be done through separate bins at the cold elevator feeders and not in the stockpile.

.6 Fine aggregate is all mineral matter passing the 5.00 mm sieve size. It shall consist of natural sand and/or manufactured material derived by crushing of stone, slag or gravel. The aggregate particles shall be clean, tough, durable, and moderately sharp. Fine aggregations shall be tested for soundness. When tested for soundness, the number of cycles shall be five (5), the solution shall be sodium sulphate, and the maximum loss shall be 15%.

.7 When it is necessary to blend fine aggregates from one or more sources to produce the combined gradation specified, each source or size of fine aggregate shall be placed in individual stockpiles at the plant site and separated by bulkheads or other means satisfactory to the Engineer. The blending shall be done through separate bins at the cold elevator feeds and not in the stockpile.

.8 If the Contractor elects to use an approved drier-drum asphalt mixing process, the designated aggregates shall be split on the 5.00 mm sieve size and each material shall be stockpiled separately such that intermixing of each size and type does not occur. The coarse aggregate stockpile shall contain no more than 20% passing the 5.00 mm sieve size and the fine aggregate stockpile shall contain no more than 20% retained on the 5.00 mm sieve size. At least 2000 tonnes of aggregate shall be placed in each stockpile prior to the start of mixing operations.

.9 The Contractor, during the crushing and splitting process, shall provide a convenient means for accurately and representatively:

.1 Sampling the individual coarse and fine aggregate streams, and the combined aggregate stream in its proper proportion, or

.2 Sampling the individual coarse and fine aggregate streams and weighing the total amounts of both coarse and fine materials being produced.

2.4 MINERAL FILLER

.1 Mineral filler shall be added in the mixing plant if the aggregate gradation is such that its addition is necessary to meet the above specifications. Mineral filler shall consist of Portland Cement, Pozzolan, commercially ground stone dust or other mineral dust approved by the Engineer. Mineral filler shall have a plasticity index of zero and shall meet the following gradation requirements.

Sieve Size	% Passing by Weight
1.250 mm	100

2.5 PERMANENT PAVEMENT MARKING

.1 Not included in contract.

2.6 LIQUID ANTISTRIPPING ADDITIVE

.1 The amount of liquid anti-stripping additive to be used in the mix shall be the greater of:

.1 The amount required to meet the required Marshall Method or Superpave moisture sensitivity requirements, or

.2 0.5% by mass of asphalt cement.

.2 Liquid anti-stripping additives shall be proportioned for use in the quantity required for the mix. Liquid anti-stripping additive shall be handled and mixed with the asphalt cement in accordance with the manufacturer's recommendations. The Contractor shall provide the Engineer with the following documentation prior to placement of mix containing liquid anti-stripping additive:

.1 The time period for which the liquid anti-stripping additive will remain stable in heated asphalt cement;

.2 Appropriate Health and Safety Data;

.3 The type and amount of liquid anti-stripping additive used; and

.4 The time and date when it was added to the asphalt cement.

If the liquid anti-stripping additive is added by the asphalt cement supplier at the refinery depot, for each tanker of asphalt cement, the Contractor shall provide the Contract Administrator with the above documentation in the form of a weigh bill or bill of lading which, accompanies the delivered asphalt cement.

If the liquid anti-stripping additive is added to the mix at a tank which is dedicated exclusively to producing hot mix for this Contract, the liquid anti-stripping additive may be added to the asphalt tanks by an in-line metering device as described below or by other means, provided that the above documentation is given to the Engineer for each batch of asphalt cement with the liquid anti-stripping agent added.

If a liquid anti-stripping additive is added to the hot mix asphalt at a tank which is not dedicated exclusively to producing hot mix asphalt for this Contract only, the liquid anti-stripping additive shall be metered by an in-line metering device controlled from inside the hot mix asphalt plant's control cabin. The Contractor must provide the Engineer with an approved statement of calibration for the metering device along with a continuous record of the process prior to placement of mix containing liquid anti-stripping additive, in addition to the above documentation each time liquid anti-stripping additive is metered into the asphalt cement.

The Contractor shall use the liquid anti-stripping additive in accordance with the obtained supplier information.

Regardless of hot mix asphalt type, the amount of liquid anti-stripping additive, either specified in the Contract documents or determined through mix design procedure, shall be a percentage of the total asphalt cement required in the hot mix asphalt if a liquid anti-stripping additive is used.

PART 3 EXECUTION

3.1 QUALIFICATIONS

.1 The Contractor shall provide an asphalt paver operator with at least five years of experience operating the equipment.

.2 Details of the work history shall be presented upon request by the Owner.

3.2 MIX DESIGN AND JOB MIX FORMULA

.1 A qualified testing laboratory engaged and paid for by the Contractor shall be employed to prepare a mix design and job mix formula for the aggregate on which the tender is based. The mix design and job mix formula shall be submitted to the Engineer for approval a minimum of fourteen (14) days prior to paving. No paving shall commence before the Engineer's approval is given for the mix design or job mix formula.

.2 The Contractor shall conduct QC Field and laboratory tests on the material delivered to and laid for the work. The Contractor must demonstrate that the material produced will consistently meet the mix design and specification requirements with respect to density, asphalt content, air voids content, quality of surface appearance etc.

.3 The Contractor shall submit field compaction test results daily to the engineer.

.4 The laboratory mix design shall be based on the Marshall Method. Absorption of asphalt into the aggregate shall be taken into account using the ASTM Bulk Specific Gravity of the aggregate in calculating optimum asphalt content.

.5 The mix design shall meet the following specifications: Minimum Maximum:

.1 12.5 mm Asphalt Mix Design:

.1 Number of compaction blows each end of Specimen 75

.2 Stability (kN) 8

.3 Flow (mm) 2 to 4

.4 % Voids total mix 3.5 to 4.0

.5 Film Thickness um 6.5

.6 % Voids Filled 68 to 75

.7 Manufactured Fines 50%

.6 The job mix formula shall list the following information:

.1 Batch Plants:

.1 The sieve analysis of the combined aggregate in the mix;

.2 The aggregate size range in each bin separation to be used;

.3 The weight of material to be used from each bin for one (1) batch of mix;

.4 The weight of asphalt to be used in each batch; and

.5 The mixing temperature of the asphalt mix as determined from the temperature-viscosity relationship for the asphalt.

.2 Continuous Plant:

.1 Proportions for a continuous feed mixing plant shall be determined on the basis of a field trial which shall be carried out at least forty-eight (48) hours prior to placing the mix on the job site.

.2 The volumetric settings of the aggregate and asphalt shall be determined by the Contractor and approved by the Engineer. These settings shall be interlocked, so that a change in the volume of aggregate automatically results in a corresponding change in the volume of asphalt.

.3 The following data shall be displayed at the plant:

.1 The weight of asphalt per tonne of mix;

.2 The mixing temperature of asphalt mix as determined from the temperature-viscosity relationship for the asphalt; and

.3 The settings of the feed systems.

3.3 CONTROL OF MIX

.1 The mix produced shall conform to the job mix formula approved by the Engineer and shall conform to the following tolerances:

.1 Aggregate:

.1 The weight of aggregate from any bin, as well as the total weight of aggregate for each bin shall not vary from the job mix formula by more than:

Aggregate Material by Weight Passing Sieve Size	**% Variation**
5 mm and larger	5
1.25 mm	3
630 um to 315 um	2
160 um and 80 um	1.5

.2 Asphalt Binder:

.1 The percent of asphalt in the mix shall not vary by more than 0.3% from the percentage indicated in the approved mix design.

.3 Mix Temperature:

.1 The mixing temperature for asphalt materials shall not vary from those specified in the job mix formula by more than 9oC. In no case shall the mixing temperature exceed the maximum mix temperature indicated from the asphalt temperature-viscosity curve data.

.4 Sand Equivalency:

.1 The combined aggregate after going through the dryer shall have a sand equivalent value of not less than 45.

3.4 HOT MIX PLANT

.1 The hot mix plant shall be of a type capable of consistently meeting or exceeding all of the requirements of these specifications.

.2 The plant shall be equipped with devices to allow samples to be taken of asphalt cement and aggregates, and shall indicate the temperature of the aggregate, asphalt cement, and mixtures. The Engineer shall have access at any time to all parts of the plant for verifications of weights or proportions.

3.5 PREPARATION OF MINERAL AGGREGATE

.1 For Pugmill Type Mixers:

.1 The aggregate may be blended either through a cold feed proportioning unit or by other means, but in any case, shall be screened into bins in accordance with the aggregate sizes called for the job mix formula.

.2 The mineral aggregate shall be dried to a maximum moisture content of 0.5%. The temperature of the aggregate, when delivered to the mixing unit, shall be at a temperature which is consistent with proper mixing and laying and in no case above 150°C.

.2 For Dryer-Drum Type Mixers:

.1 Each aggregate size shall be fed through a separate feeder which has a positive feed and which can be easily and accurately calibrated. Each feeder shall be quick adjusting and shall maintain a uniform, constant flow throughout the range of its calibration. The plant shall be equipped with an aggregate cold feed control, such as a belt scale or other device, which automatically and instantly regulates the feed gates and which has an automatic, positive coupling with the bitumen flow to maintain the required asphalt content. The mineral aggregate shall be dried to a maximum moisture content of 0.5%. The temperature of the aggregate, when delivered to the mixing unit, shall be at a temperature which is consistent with proper mixing and laying and in no case be above 150°C. Removal or addition of any size of aggregate, to attain gradation requirements, shall be done at the initial crushing and stockpiling stage. The cold feed control and bitumen flow shall be calibrated to the job mix formula.

3.6 PREPARATION OF BINDER

.1 The asphalt binder shall be maintained at a temperature between 120°C to 150°C by approved means to obtain uniform heating of the entire contents of the storage tank. The temperature differential between aggregate and asphalt binder shall be no more than 15°C.

3.7 MIXING

.1 For Pugmill Type Mixers:

.1 The mineral aggregate and asphalt binder shall be mixed in such a manner as to produce a homogenous mixture in which all particles of the mineral aggregate are uniformly coated and in the proportions called for in the approved job mix formula. The volume of mineral aggregate and asphalt cement shall not be so great as to extend above the tips of the mixer blades when the blades are in a vertical position. After the hot aggregate and mineral filler have been charged into the mixer and thoroughly mixed for a period of not less than fifteen (15) seconds, the asphalt binder shall be added and the mixing continued for a period of at least twenty (20) seconds and not more than forty-five (45) seconds.

.2 For Dryer-Drum Type Mixers:

.1 The dryer-drum mixer mixing process shall produce a uniform mixture in which all aggregate particles are coated with asphalt. The plant shall be equipped with an automatic, positive coupling which instantly regulates the aggregate cold feed gates with the bitumen flow to maintain the required asphalt content.

3.8 WEIGHING PROCEDURES

.1 Weighing shall be carried out using a weigh scale bearing a site inspection certificate of acceptance by the Department of Weights and Measures. The scale shall be capable of accurately weighing the heaviest loaded truck to be used on the project in one (1) weighing procedure.

.2 The scaleman required to carry out the weighing shall be supplied by the Contractor. The tare weight of each truck used for hauling asphalt concrete pavement shall be measured at the start and end of each day's work. Weighing certificate forms shall be supplied by the Contractor. A weight slip, prepared in triplicate and certified by the scaleman, shall be issued for each load. The weight slip shall bear the truck number, tare weight, loaded weight, and the signature, initials, or other approved marking of the issuing scaleman. Two (2) copies of the weight slip shall accompany each load. These slips shall be turned over the Engineer at the point of delivery. Upon delivery, each load shall be witnessed by the Engineer who will mark the slips and return one (1) copy.

.3 Where payment is to be made on the basis of weight, weight slips retained by the Engineer shall be the basis for quantity calculations for payment purposes.

.4 Where payment is to be made on the basis of area, weight slips retained by the Engineer will be used for checking the placement rate.

3.9 PRIME COAT

.1 The use of prime coat is at the sole discretion of the Contractor. The placement of prime coat will not be measured or paid for separately. If utilized the application of material shall be in accordance with this specification.

.2 The asphalt material shall be applied by means of a self-powered pressure distributor equipped with the following control devices:

- .1 Tachometer
- .2 Pressure gauge
- .3 Adjustable length spray bar
- .4 Positive displacement asphalt pump with separate power unit
- .5 Heating coils and burner capable of applying even heat to the asphalt material
- .6 Thermometer well and accurate thermometer

.3 Before applying the asphalt material, the Contractor shall ensure that the distributor meets the following adjustments and requirements:

- .1 The distributor vehicle will maintain a constant height of the spray bar as the tank is unloaded.
- .2 All spray bar nozzles are of the same manufacture, type and size.
- .3 Clogged nozzles have been removed and cleaned with solvent.
- .4 All nozzles have been set in the spray bar so that the nozzle slots make the same angle (15 to 30 degrees) with the longitudinal axis of the spray bar.
- .5 The spray bar has been adjusted to the correct height to ensure uniform application without streaking.
- .6 The spray bar has been provided with a positive shut-off to prevent dribbling.
- .7 The distributor is capable of maintaining a uniform speed.

.4 Upon a uniformly damp base course, a prime coat shall be uniformly applied, as follows:

.1 Dilution rate: 2 parts SS-1 to 1 part water.

.2 Distribution rate: 2.0 liters per square meter.

.3 Emulsion temperature: 20°C to 50°C.

.4 Ambient air temperature: shall be greater than 4°C. Curing time: minimum of two hours. If weather or other conditions have been such that the prime has not fully cured at the end of two hours, the Engineer may extend the curing period as he deems necessary.

.5 Traffic shall be kept off primed areas until prime has cured.

.6 Apply additional prime to fill voids, to coat and bond particles, or as directed by the Engineer.

.7 If the prime surface is loose, roll with a pneumatic-tired roller.

.5 The asphalt shall be uniformly applied without streaking.

.6 Joints and seams shall not be excessively overlapped. Structures, wheel guards, guardrail or other roadway appurtenances shall not be spattered by the asphalt material. The Contractor shall remove, at his own expense, any spattering caused by his operation.

.7 Areas missed by the distributor or inaccessible to the distributor shall be treated using a hand spray or pouring pot.

.8 Traffic shall not be permitted to travel on prime coat until six hours after application or until it has cured. After this period of time, excess asphalt material remaining on the surface shall be blotted by sand before traffic is permitted to travel on the surface. The 'blotter sand' can be any clean sand.

.9 The prime coat shall be maintained by the Contractor at his own expense, including the required liquid asphalt. Any area of Prime Coat that has become fouled shall be repaired before Hot Mix Asphalt Concrete is placed.

3.10 TACK COAT

.1 Tack coat shall be applied to the edge of curbs, existing asphalt concrete, manholes, etc. where the surface of these structures will be in contact with new asphalt concrete pavement.

.2 Where the surface course of asphalt concrete pavement is not placed immediately after the lower course and when directed by the Engineer, tack coat shall be applied to the lower course of asphalt concrete pavement as specified for existing asphalt concrete pavement surfaces.

.3 Tack coat shall be applied only when the surface is dry and clean, and the air temperature is over 10°C. Care shall be exercised in the application of tack coat to avoid application to areas which will not be paved.

.4 Existing asphalt concrete surfaces shall be thoroughly cleaned by a power-driven sweeper immediately prior to applying the tack coat.

.5 Tack coat shall be uniformly applied with an approved pressure distributor at a rate of 0.25 to 0.17 litres per square metre. The temperature of the material shall be maintained between 32°C and 38°C.

.6 Traffic shall, where possible, be kept off tack coat areas.

3.11 TRANSITIONS

.1 Transitions shall be constructed by saw cutting and removing the existing pavement to the limits shown on the drawings, or as directed by the Engineer. The exposed road base shall be regarded and base material added as required to attain the specified grade and cross section. Before placing the asphalt concrete, the exposed road base shall be thoroughly compacted to 100% of Standard Proctor Density (ASTM D698). The pavement thickness shall be as shown on the drawings, or as specified by the Engineer.

3.12 CONNECTIONS TO EXISTING PAVEMENT

.1 Connections to existing pavement shall be made by saw cutting back the existing pavement to sound material, and providing a neat vertical face with a straight edge. The new pavement shall be placed tight to the existing pavement and the finished surface shall be flush with the existing pavement. Prior to paving, the exposed face of the existing pavement shall be painted with tack coat.

3.13 BASE PREPARATION

.1 The hot mix shall be laid upon a dry firm base, true to grade and cross section and free from all screenings, loose, or foreign material. No hot mix shall be spread when the base is wet, frozen or when other conditions prevent proper spreading, finishing or compaction.

.2 If undercutting, and subsequent backfill with hot mix is done, the backfill operation shall be performed sufficiently far ahead of the paving operation to allow the asphalt concrete sufficient time to cool down to support equipment.

3.14 TRANSPORTATION OF MIXTURE

.1 The hot mix shall be transported from the mixing plant to the work, in vehicles with tight metal boxes previously cleaned of all foreign materials. The inside surface may be lightly lubricated with thin oil or soap solution just before loading but excess of lubricant shall not be permitted. Any puddling of the lubricant constitutes excess usage.

.2 To allow the recording of asphalt mix temperatures, truck shall have an accessible 15 mm diameter hole drilled into the driver's side of the box, at a distance of 300 mm from the box bottom and 150 mm clear of the reinforcing ribs.

.3 To protect the load from adverse weather conditions during transit, trucks shall carry at all times tarpaulins of sufficient weights and size to cover the entire open area of the truck box. Regardless of weather conditions, tarpaulins shall be used when ordered by the Engineer. Tarpaulins shall be used when the air temperature is below 16°C.

.4 No loads shall be sent out so late in the day as to prevent spreading and compacting the mixture during daylight hours.

.5 The Contractor shall provide a sufficient number of trucks to ensure a continuous supply of asphalt to the paver during placement.

3.15 SPREADING MIXTURE

.1 The asphalt mix shall be laid at a temperature not lower than 120°C or more than 140°C.

.2 Place mixture when the roadway surface temperature is 15°C or higher unless otherwise approved.

.3 The asphalt mix shall be spread on dry, clean and unfrozen surfaces.

.4 The asphalt mix shall be spread by means of a mechanical self-propelled paver or approved mechanical spreader capable of spreading the mixture true to the line, grade and crown set by the Engineer. Unless operating on fixed side forms, the paver shall employ mechanical devices such as equalizing runners, straight-edge runners, evener arms or other compensating devices to adjust the depth and confine the edges of the mixture to true lines without the use of stationary side forms.

.5 The paver shall be operated in such a manner as to distribute the asphalt mix to the proper cross-section, width and thickness without causing segregation of the mix. Small segregated areas which may occur shall be corrected immediately. The forward motion of the spreader shall be controlled so that no irregularities in the pavement surface are caused by excessive speed or stops.

.6 The rate of placement of the asphalt mix shall be uniform and coordinated with the production rate of the asphalt plant to minimize intermittent operation of the spreader.

.7 The paver shall be equipped with an adjustable strike off screed of such design that drag marks will be eliminated. The paver shall carry an approved 3 m straight-edge for checking finished surface.

.8 Immediately after any course is screened and before compaction is started, the surface shall be checked and any irregularities adjusted. Irregularities in alignment and grade along the outside edge shall also be corrected by the addition or removal of mixture before the edge is rolled.

.9 The Contractor shall provide a competent workman who is capable of performing the work incidental to the correction of all pavement irregularities. Special attention shall be given by him to the straight-edge checking of each course immediately following the initial rolling.

.10 Compacted depth of 75 mm or less of asphalt mix may be placed in one (1) lift. Depths greater than 75 mm shall be placed in two (2) equal lifts.

.11 Where the asphalt mix is to be placed in two (2) lifts, the first lift shall be placed, finished and compacted for the full width as shown on the drawings, prior to commencing on the second lift.

.12 In placing the second lift, the individual mixture spreads shall be aligned in a manner such that the longitudinal joints in each layer will not coincide.

.13 In narrow areas, deep or irregular sections, intersections, turnouts, or driveways where it is impractical to spread with a paver, the Contractor may use hand methods as directed by the Engineer.

.14 Hauling over new pavement will not be permitted until the mixture has been thoroughly compacted in the manner specified and has cooled to atmospheric temperature.

.15 Contact faces of curbs, gutters, manholes and sidewalks shall be coated with asphalt using a hand applicator before placing the asphalt mix.

3.16 LEVEL COURSE

.1 Leveling of uneven or broken surfaces over which asphaltic concrete is to be placed shall be accomplished by the use of asphaltic concrete placed with a motor grader, a paving

machine, by hand raking, or by a combination of these methods as directed by the Engineer.

.2 Before commencing the level course operation the Engineer shall be contacted so that assistance can be given in maintaining the proper grades, lines and typical cross-sections.

.3 After placement, the asphaltic concrete used for leveling shall be compacted thoroughly with pneumatic-tired rollers.

.4 In the event that the level course is to be used as a wearing surface, the level course shall be machine placed.

3.17 JOINTS

.1 Longitudinal and transverse joints shall be made in such a manner as to provide proper bonding between the two mats for the full depth of the joint.

.2 Transverse joints shall be made by cutting back on the previous course in order to expose its full depth. When spreading of the course is resumed, the exposed edge of the joint shall be painted with an approved bituminous material and the freshly laid mixture shall be raked against the joint, tamped with hot tampers and rolled.

.3 The mixture shall be spread and laid so that all longitudinal joints are made while the asphalt mat which was laid first is still hot.

.4 Longitudinal joints shall be vertical butt type, well bonded and sealed and finished to provide a continuous, smooth profile across the joint. Longitudinal joints shall not be permitted in the lane.

.5 A narrow strip along the edge of a mat which is to be jointed with another asphalt mat shall be left without rolling until the adjoining mat has been placed against it. The joint which is formed shall be rolled immediately after the adjacent mat has been placed to ensure a bonding of the material while the asphalt is still hot. Any cooled longitudinal joint shall be cut and primed prior to the commencement of an adjoining mat.

.6 Care must be taken during the forming of the joints so that there will be a continuum of surface planes devoid of ridges or depressions at the joints. Any joint which is not straight or is hollow, segregated, raised or in any way deemed by the Engineer as being unsatisfactory will be rejected.

.7 Transverse joints in succeeding lifts shall be offset at least 0.6 m and in adjacent lanes they shall be offset a minimum of 0.3m. Longitudinal joints shall be offset at least 0.2 m.

.8 Where mechanical placing methods do not produce proper joints at gutters, curbs, or other structures, hand methods will be required.

.9 When paving is discontinued on the roadway, the asphalt concrete shall be temporarily feathered to a slope of 10 horizontal to 1 vertical. When paving is resumed, the transverse joint shall be straight and have a vertical face when the taper is removed.

.10 The exposed edges of all cold asphalt joints and the face of concrete gutter shall be cleaned and painted with a thin coat of hot asphalt cement. When the ambient air temperature is less than 10°C, joints shall be heated using an infrared heater prior to painting with hot asphalt cement.

.11 Where a transverse joint is made with a cold asphalt mat, the joint shall be made on a vertically true line. Cold jointing shall be done in such a manner as to ensure a thorough and continuous bond between the cold and the hot mats.

.12 A cold asphalt shall be one where the surface temperature, taken within 600 mm of the edge of the mat is less than 65°C.

.13 In order to eliminate longitudinal cold joints in the surface course, the use of two asphalt spreaders in tandem shall be required wherever road widths permit.

3.18 COMPACTION

.1 After the asphalt mix has been spread to the uniform thickness required, it shall be compacted to a minimum of 97% of the 75 Blow Marshall Density. The Contractor shall be responsible for the selection of the type and number of units of compaction equipment. Compaction to the specified density shall be completed before the asphalt mixture has dropped in temperature to 65°C.

.2 The rollers shall be kept in continuous motion while on the hot mat in such a manner that all parts of the pavement receive equal compression.

.3 The Engineer reserves the right to reject the use of any equipment or construction procedure which does not or will not, in his opinion produce proper results.

.4 The Contractor shall provide a sidewalk roller, hand tampers and other compaction equipment as required for compaction in restricted areas.

.5 The speed of compaction equipment shall not exceed 5 km/hr and shall at all times be slow enough to avoid displacement of the asphalt mix. Any displacements which occur as a result of reversing the direction of the roller, or from any other cause, shall at once be corrected by the use of rakes and the addition of fresh mixture where required. Rolling shall proceed continuously until all roller marks are eliminated and no further compression is possible. To prevent adhesion of the mixture to the roller, the wheels shall be kept moist with water, but excess water will not be permitted. Fuel oil, lubricating oil or kerosene will not be permitted.

.6 Along curbs, manholes and other structures not accessible to the rollers, the mixture shall be compacted thoroughly by means of hot tampers. The joints between these structures and the mixture shall be effectively sealed.

.7 Longitudinal joints shall be rolled directly behind the paver.

3.19 SURFACE SMOOTHNESS AND GRADE

.1 After final compaction, the asphalt surface shall be smooth and true to the established crown and grade and have a smooth riding quality. The finished surface of the mat shall be free from segregation, waves, hairline cracks and other obvious defects.

.2 The surface of the mixture after compaction shall be smooth and true to established section and grade. Areas in which any mixture shows an excess or deficiency of asphalt, or uneven distribution of asphalt due to insufficient mixing, or which becomes loose, broken, ravelled, mixed with dirt, or is in any way defective, shall be removed and replaced with fresh hot mixture at the Contractor's expense and be immediately compacted to conform with the surrounding area.

.3 The surface of the finished pavement shall be free from depressions exceeding 6 mm as measured with a 3 m straight-edge parallel to the centreline of the road.

.4 The surface of the finished pavement shall not be more than 15 mm above the gutter lip, but in no case lower than the gutter lip. In general, the elevation of the finished asphalt

surface shall not be more than 15 mm below or more than 25 mm above the elevation staked. The finished surface shall not contain any variations which will impede drainage.

3.20 ASPHALT THICKNESS

.1 All asphalt courses shall be constructed to the thickness specified. Any areas suspected to be deficient in thickness shall be cored and those areas represented by the deficient thicknesses shall be subject to a payment reduction as outlined in Subsection 1.3 Measurement and Payment.

3.21 ASPHALT SEGREGATION

.1 Areas of segregation will be identified visually by the Engineer and the areas for repair will be marked out. Areas of segregation and surface defects will be considered unacceptable work until the areas are repaired, at no additional cost to the Owner, by the following methods:

.1 The Contractor shall apply a slurry seal patch that meets the following requirements:

.1 The seal shall be a mixture of a dry, non-plastic sand, an emulsified asphalt SS-1 (slurry), potable water and if needed, acceptable additives such as Portland Cement and Carbon Black for color.

.2 The gradation of the sand shall meet the requirements of section 31 05 16 – Aggregates for Earthworks.

.3 The mix proportions for a 1,000 liter batch of seal shall be as follows:

.1 360 liters of SS-1 (slurry);

.2 270 liters of potable water; and

.3 850 kg of dry, non-plastic sand. The Contractor shall add the water to the emulsified asphalt followed by the addition of the sand.

.4 The Contractor shall thoroughly mix the seal. If a mineral filler is used, it shall be blended into the mixture. A minimum amount of additional water may be added to obtain a fluid, homogeneous mixture.

.5 If a tack coat is required, the same asphalt chosen for the seal binder shall be used.

.6 The seal shall be neat and square; and uniform and homogeneous with no uncovered areas, ridges or loose aggregate.

.7 Hand or mechanical squeegees may be used to spread the seal.

.8 The completed seal shall be kept free of all traffic until it has cured sufficiently to prevent pickup of aggregate particles.

.2 Repairs for segregation using removal and replacement shall be for the full lane width. The full depth of the asphalt lift shall be removed and replaced in accordance with the specification.

.3 Repairs for segregation using an overlay shall be for the entire pavement width.

.4 All asphalt material used for overlay and removal and replacement repairs shall have a tack coat applied prior to placement.

.5 Any other methods of repair proposed by the Contractor will be subject to the approval of the Engineer with the exception that the application of asphalt (by

distributor, hand spraying, squeegeeing, etc.) shall not be permitted as a method of repair under any circumstances.

.6 Repairs shall be completed during construction or shortly after construction, except when prevented by inclement weather or seasonal shutdown. In these cases, the Contractor shall complete the repairs prior to June 30 of the following year.

3.22 CLEANUP AND TRAFFIC

.1 The entire project, including construction areas as well as Contractor's yards, shall be left in a neat and tidy condition. All construction refuse shall be removed from boulevards, ditches, roadways and yards to the satisfaction of the Engineer.

.2 Traffic shall not be permitted on the finished pavement until it has cooled to atmospheric temperature. The Contractor shall be responsible for traffic control during construction and shall maintain traffic to the satisfaction of the Engineer.

3.23 DIESEL FUEL

.1 Diesel fuel is prohibited from use as a lubricant or asphalt release agent on all City Projects. This includes its use on the beds of asphalt delivery vehicles, pneumatic tire rollers, tools and for cleanup operations.

3.24 QUALITY CONTROL

.1 The Contractor shall be responsible for quality control to ensure the asphalt placed meets the requirements of the contract.

.2 The Contractor must employ a suitable materials testing company to monitor all of the quality requirements for the project.

.3 The Contractor is responsible for correcting any portions of the work that do not meet the project requirements.

3.25 TESTING AND INSPECTION

.1 The Engineer shall have access at any time to all parts of the paving plant for checking mix proportioning and other tests. Quality Assurance (QA) Tests will be taken by the Engineer at his discretion at no expense to the Contractor to check compliance with specifications and to determine acceptability of the end product.

.2 Copies of test results will be made available to the Contractor after review by the Engineer.

.3 Electronic copies of results for all Quality Control (QC) testing carried out by the Contractor shall be forwarded directly to the Engineer.

.4 Areas found to be less than the specified thickness shall be subject to further investigation. This investigation shall be carried out on either side of the test locations indicating thin pavements and shall cover the entire area between adjacent test locations which indicate adequate pavement depth.

.5 The above area shall be tested on the basis of one (1) depth test per 200 square metres of pavement. Test locations shall be determined by a random number system as specified in the Asphalt Institute Manual Series Number 1 (MS-1).

.6 It shall be the Testing Agency's responsibility to fill in all core holes within twenty-four (24) hours of the test.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 20 00 – Measurement and Payment.

.2 Section 01 29 83 – Testing and Laboratory Services.

.3 Section 01 33 00 – Shop Drawings and Submittals.

.4 Section 01 35 30 – Health and Safety Requirements.

.5 Section 01 35 43 – Environmental Procedures.

.6 Section 01 45 00 – Quality Control.

.7 Section 01 51 0 – Temporary Utilities.

.8 Section 01 61 00 – Common Product Requirements.

.9 Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

.10 Section 01 74 23 – Closeout Submittals.

.11 Section 01 78 23 – Operation and Maintenance Manual.

.12 Section 01 78 39 – Project Record Drawings.

.13 Section 31 05 16 – Aggregates for Earthworks.

.14 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.15 Section 32 11 23 – Aggregate Base Courses.

.16 Section 33 31 11 – Public Sanitary Sewerage Gravity Piping.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute/American Water Works Association (ANSI/AWWA).

.1 ANSI/AWWA B300-2018, Hypochlorites.

.2 ANSI/AWWA B301-2018, Liquid Chlorine.

.3 ANSI/AWWA B303-18, Sodium Chlorite.

.4 ANSI/AWWA C500-2019, Metal-Seated Gate Valves for Water Supply Service.

.5 ANSI/AWWA C504-2015, Rubber-Seated Butterfly Valves.

.6 ANSI/AWWA C651-2014, Disinfecting Water Mains.

.7 ANSI/AWWA C800-2014, Underground Service Line Valves and Fittings.

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM D698-12(2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft;) (600kN-m/m;).

.2 ASTM F714-21a, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

.3 American Water Works Association (AWWA)/Manual of Practice

.1 AWWA M17-2016, Installation, Field Testing, and Maintenance of Fire Hydrants.

.4 Canadian General Standards Board (CGSB)

.1 CGSB 41-GP-25M-2012, Polyethylene, for the Transport of Liquids.

.5 Canadian Standards Association (CSA International)

.1 CSA B137 Series-13, Thermoplastic Pressure Piping Compendium. (Consists of B137.0, B137.1, B137.2, B137.3, B137.3.1, B137.4, B137.4.1, B137.5, B137.6, B137.8, B137.9, B137.10, B137.11 and B137.12.

.1 CSA B137.1-13, Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services

.6 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.7 Transport Canada (TC)

.1 Transportation of Dangerous Good Act, 1992 (TDGA).

.8 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S520-M91, Standard for Fire Hydrants.

.2 CAN4-S543-M84, Standard for Internal Lug Quick-Connect Couplings for Fire Hose.

1.3 WORK INCLUDED

.1 The work to be done under this contract consists of furnishing all equipment, materials and labour necessary for the installation of water mains and water services in accordance with the terms of this contract.

.2 Specifically, the work shall include:

.1 The installation of the water mains as specified in this section or shown on the contract drawings, including any connections to access vaults or existing water mains.

.2 Carry out a pressure and leakage test on all new works.

.3 Chlorination and commissioning of the new water mains.

.4 Excavation, backfilling, consolidation and restoration of surfaces.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for distribution piping materials and include product characteristics, performance criteria, physical size, finish, and limitations.

.2 Distribution piping materials include, but not limited to:

.1 Pipe.
.2 Fitting.
.3 Valve.
.4 Fire hydrant.
.5 Mechanical restraint.
.6 All materials used for the distribution system.
.7 Pipe certification to be on pipe.

.2 As-built data:

.1 Submit data to produce record drawings, including directions for operating valves, list of equipment required to operate valves, details of pipe material, hydrant details.

.1 Include top of pipe, horizontal location and vertical elevation of fittings and type, valves, valve boxes, and hydrants.

.2 Operations and Maintenance Data: submit operation and maintenance data for pipe, valves, valve boxes and hydrants for incorporation into manual.

.3 Record top of pipe elevations for water main and water services every 10 metres and send to Engineer for approval prior to backfilling pipe. If pipe is backfilled and pipe elevations are found to be unacceptable, the Contractor shall excavate buried pipe and realign in accordance with Contract Drawings or alignment deemed acceptable by Engineer.

1.5 RECIRCULATION LINE

.1 All references to water mains within these specifications shall also apply to the installation of recirculation lines.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Polyethylene Pipe

.1 All polyethylene pipe shall be Series 160 (1103 kPa) high density polyethylene (HDPE) pipe with 75 mm urethane insulation encased in a 1.14 mm polyethylene black jacket conforming to CGSB 41-GP-25M77.

.2 Where specified on the drawing for the water main to be metal jacketed, the above described pipe will be wrapped in 26 gauge galvanized steel jacket outside the polyethylene jacket.

.3 All polyethylene pipe, fittings, stubends, etc., shall be of the same manufacturer's series, wall thickness and the same grade of polyethylene. All gaskets will have the same internal diameters as the series pipe and all bolts and backup rings will be compatible to allow tightening without washers. Standard of acceptance shall be KWH Sclairpipe, Urecon UIP, or approved equal.

.4 No joints shall be allowed in piping covered with shop applied insulation.

.5 All jacketed pipe shall have a permanent factory applied marking indicating manufacturer, size, series, and project identification at not greater than one meter intervals along its length, i.e. “Dupont 200 mm Series 160”.

.2 Urethane Insulation

.1 Insulation for pipe lines, fittings, etc., shall be rigid closed cell polyurethane insulation to the thickness shown on the drawings. No joints shall be allowed in piping covered with shop applied insulation. Properties of all urethane insulation shall be:

Density (kg per cubic metres core) ASTM D-1622	35
Compressive Strengths kPa @ 25°C 10% Deflection measured axially ASTM D-1621-64	240
Thermal Conductivity W/m°C @ 25°C ASTM D-2326-64T	0.0187
Operating temperature range °C Cyrogenic to +	93
Closed Cell Content – % ASTM D-2856	90 min
Water absorption gm/1000 cc ASTM D-2842	12
Dimensional Stability, % ASTM D-2126 Procedure B & E	3

.3 Warning Tape

.1 The warning tape of water mains shall be 150 mm wide by 0.15 mm polyethylene tape. It shall be blue in colour and have a factory applied marking at one metre intervals, i.e., “Caution Buried Water Line”. The standard of acceptance shall be Decto Tape by Allan Systems.

.4 Field Joint Sleeves

.1 Wrap sleeves for field fusion joints and for flanged connections to vaults shall be 2.7 mm thick. Canusa Wrap LPW or equal. Each wrap will confirm to the manufacturer’s recommended width and length for each size of pipe.

.5 Heat Shrink Tape

.1 Heat shrink tape shall be 150 mm wide with the standard of acceptance being Raychem Thermoclad.

.6 Half Shells

.1 Half shells shall be made of urethane insulation with the properties as described in Section 2.1.6, and shall have a thickness equivalent to the urethane insulation on the pipe.

.7 Field Applied Urethane

.1 Field applied urethane shall be “Portafoam” manufactured by Insta-Foam Products Inc., or equivalent.

.8 Pipe Bedding

.1 Pipe bedding shall be sand conforming to the specifications for Modified Granular “C”, as listed in Section 31 05 16.

.9 Trench Insulation

.1 Trench insulation shall be Styrofoam HI-40, 2440mm wide 50 mm thick.

.10 Valves, Couplings, & Fittings

.1 Valves, couplings, and fittings shall be compression type designated for use with polyethylene piping and properly sized for the pipe used. All connections will include stainless steel inserts 50 mm long and tight fitting within the service pipe. Longitudinally split inserts will not be accepted.

.11 Water Service Saddle

.1 Water service saddles shall be bronze Robar NO. 2706 with double stainless steel straps (or approved equal).

PART 3 EXECUTION

3.1 DRAINAGE

.1 The Contractor shall keep all portions of the work properly and efficiently drained during construction and until completion. He shall be held responsible for all damage that may be caused as the result of water backing up or flowing over, through, from, or along any part of the work or surrounding properties due to his operation.

.2 All costs associated with providing drainage for the work as required, shall be included in the unit prices for the installation of each associated item.

3.2 SITE RESTRICTIONS

.1 When planning the work, the Contractor shall make due allowance for the presence of the existing structures, access, utilities and the operation of others on the site.

.2 Supports, adequate protection and maintenance of all existing underground and surface utility structures, drains, sewers, ducts, conduits, power poles and other obstructions encountered during the progress of the work, shall be provided by the Contractor at his own expense.

3.3 SERVICE CONNECTIONS

.1 Excavation, bedding, backfilling, urethane insulation, piping insulation system, and styrofoam used in the installation of service connections shall conform to the same requirements as for main line installation.

3.4 WATER SERVICE

.1 The water service duct shall be of a size and material as illustrated on the Contract Drawings.

.2 Pipe connections in the water service duct shall be butt fused as described in Clause 3.13.2. No joints or the service pipe will be permitted within the duct.

.3 The Water Service Information Sheet, or equivalent, provided by the local municipal authority must be filled in and submitted for each service.

.4 Drill and tap mains with main under operating pressure after main has been pressure tested, flushed and chlorinated, with a tapping machine capable of inserting corporation stops into main or saddle. Alternatively, the Contractor may dry tap the service connections provided flushing, pressure testing, and chlorination of the services occurs with the main as one system.

.5 Tap main at 3:00 o'clock or 9:00 o'clock position. Service tapping shall be a minimum of 450 mm apart or from any fused connection in the mains. Install saddle using a torque wrench as per manufacturer's instructions. Including re-torquing after set time.

.6 Construct service connection as shown on drawings.

.7 All exposed surfaces including factory coated surfaces of polyurethane are to be coated with mastic.

.8 Flush each service line for a minimum of 5 minutes.

.9 Pressure test the services in coordination with Clause 3.14. Initial pressure test on service is not required.

.10 Joints must be left exposed during pressure test to allow visual inspection.

.11 If water service is not to be connected immediately to house then water lines must be plugged with a water tight plug on the end and ball valve shut off at the main. In these cases, the 100 mm carrier pipe will be installed to 1.0 m into the property for future connection. Sufficient water service pipe (both 25 mm lines) to reach the centre of the lot plus (5) metres will be installed. The length of service pipe that exceeds the carrier pipe will be rolled up and wrapped in plastic. The end of the 100 mm carrier pipe shall be covered with an end cap to prevent debris from entering. Drill holes in the water carrier end cap to allow the 25 mm water service pipe through.

3.5 INSPECTION

.1 All material is subject to inspection and testing for soundness and suitability at the discretion of the Engineer.

.2 All works shall be undertaken in strict adherence to the manufacturer's instructions, which are considered as being part of these Specifications. As each section of the work is

completed, it shall be tested in the manner specified, and in the presence of, and as approved by, the Engineer.

.3 All material found during the progress of the work to have cracks, flows, or other defects, or to be of doubtful quality, will be rejected by the Engineer. All rejected materials shall be promptly removed from the site of the work by the Contractor and all costs associated with the removal and replacement of rejected material shall be borne by the Contractor.

3.6 HANDLING OF MATERIAL

.1 The material shall be delivered and distributed at the site by the Contractor. All pipe and accessories shall be loaded and unloaded by lifting manually or with hoists so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Insulated pipe shall not be skidded on the ground or against pipe already on the ground.

.2 In distributing the polyethylene pipe at the site of the work, each piece shall be unloaded opposite or near the place where it is to be installed.

.3 Pipe shall be handled so the exterior and interior surfaces, prefabricated joints, insulation, etc., will not be damaged. If, however, any part of any surface, coating or lining is damaged, the repair shall be made by the Contractor at his own expense, in a manner satisfactory to the Engineer.

3.7 ALIGNMENT AND GRADE

.1 All pipe sections shall be laid and maintained to the required lines and grades, with fittings, valves, hydrants, access vaults, etc., at the project locations; with joints centred.

.2 No deviation from authorized lines and grades shall be made without the written approval of the Engineer. If, in the opinion of the Engineer, the Contractor’s method of setting grades is inaccurate or insufficient, the Engineer may direct that more suitable equipment and methods be used to ensure that proper grades are established.

3.8 WATER IN EXCAVATION

.1 Work shall be carried out in a dry trench. Water shall not be allowed to run over the invert, reach the joints, or run through the pipe sections during construction.

.2 All water pumped or drained from the work shall be disposed of in a suitable manner satisfactory to the Engineer, without damage to the construction work of other property, structures, or persons.

3.9 PIPE BEDDING

.1 Insulated piping shall be bedded in Modified Granular “C” with a minimum of 0.15 m below the insulation, 0.15 m on both sides and 0.30 m above the insulation of the piping. Mechanical tamping of the pipe bedding shall be carried out in 0.15 m loose layers.

.2 The pipe bedding shall be compacted to 95% Standard Procter Dry Density as per ASTM D698-07e1. Compaction in a wet trench will be not acceptable. The Contractor shall provide daily compaction test results to the Engineer.

.3 Bedding shall be deemed unsatisfactory if, in the opinion of the Engineer, compaction cannot be obtained because of the presence of water.

.4 No extra payment shall be made for the replacement of bedding that has become unsatisfactory due to water from any source.

3.10 WARNING TAPE

.1 A continuous run of "warning" tape shall be laid on the pipe bedding 0.6 m directly above the water main.

3.11 FIELD APPLIED URETHANE

.1 Field spraying of urethane will be carried out by experienced operators only using "Insta-Foam Froth-Pak" kits or approved equal. Exposed urethane shall be coated with 1 mm of Flint Kote-Superior Asphalt Mastic No. 110-14 and heat shrink sleeves. Where geometry does not permit the use of heat shrink sleeves, two layers of Raychem Thermoclad 150 mm wide tape with 50% overlap shall be used.

3.12 PIPE LAYING

.1 Lengths of polyethylene pipe water mains to be laid between flanged fittings on access vaults shall be assembled on dry ground by butt-fusion, complete with flanged ends. The pipe shall be pressure tested (as described in Clause 3.14) and installation of urethane half shells shall be completed prior to laying the pipe in the trench. To prevent the entry of rubbish, blind flanges shall be installed on the ends of mains prior to installation in the trench and shall only be removed immediately prior to connection to the access vault.

.2 The water mains shall be laid to the alignment and grades shown on the drawings.

.3 It is prohibited to drag pipe over the ground which would damage the black jacket or insulation. If the pipe or fused sections of the pipe are to be moved, they must be supported on rollers or completely suspended.

.4 Slings used to lower the insulated pipe into the trench shall support the pipe without causing damage to the jacketing insulation (see Clause 3.6).

3.13 PIPE JOINTS

.1 The insulation shall be cut back 190 mm, as shown on the drawing to allow for the field joining of the pipe. Care shall be taken, when cutting away insulation from the pipe, not to cut the pipe beneath the insulation. Cut pipe shall be rejected from the work. Field cut insulation shall be treated with mastic.

.2 Thermal butt-fusion of polyethylene pipe shall be carried out as recommended by the supplier, but only by a certified butt-fusion technician.

.3 When joining the sections of pipe, it is the fusion equipment that must be moved from joint to joint.

.4 Should it become necessary, and only upon authorization by the Engineer, polyethylene spacer blocks, properly machined, and of the same material as the main, may be used

when required to connect the mains to the access vaults. The spacer blocks shall be installed between the flanges. Only one spacer block is permitted for each connection.

.5 Back up flanges for flange connections shall be ductile iron. Bolts shall be galvanized or cadmium plated. All required bolts and gaskets shall be provided by the Contractor.

.6 Where the drawings call for the use of heat shrink tape or where the geometry of bends and fittings prevents the installation of heat shrink sleeves over the insulation, then two wrappings of heat shrink tape in 150 mm widths shall be applied. The first complete wrapping shall be applied and shrunk down before the second wrapping is applied. The tape shall overlap 50% as it wrapped around the pipe of fitting. These methods shall be used to repair all damage to insulation jacketing.

3.14 PRESSURE TESTING OF POLYETHYLENE PIPE

.1 A pressure test shall be performed on each section of water main, before the insulation of the joints or installation in the trench. A section of water main shall be considered to consist of a length of pipe between two (2) flanged fittings.

.2 The purpose of the pressure test is to verify all joint and pipe integrity.

.3 The Contractor shall provide all necessary labour, materials and equipment for the test including a suitable pump and measuring tank, pressure hoses, connection plugs, caps, gauges and all other apparatus necessary for filling the piping, applying the required test pressure, and record the pressure losses.

.4 Water shall be used for testing. The Contractor shall provide temporary heating and additional insulation as required to keep the water in the pipe from freezing.

.5 Payment for the cost of testing shall be included in the unit price tendered for installation of the water main.

.6 The ends of the pipe to be tested shall be sealed off using blind flanges and gaskets. The flange on the lower end of the pipe shall be tapped to receive the test pump discharge line. The flange on the high end of the pipe shall be tapped to receive a vent cock to discharge air from the line during the filling process. The pipe shall be laid to a continuously rising grade to the vent cock.

.7 The pipe shall be filled with water at a gauge pressure of 1.5 times the series rating of the pipe. No pressure drop will be allowed during this period and maintained for one hour. All leaks or defective material shall be repaired to the Engineer’s requirements, or replaced. Any section requiring repair shall be retested.

.8 Sections of water main shall be installed only after passing the pressure test as outlined above.

3.15 PRESSURE TEST WATER SYSTEM

.1 After the water main system, complete with fittings, valves and hydrants, has been installed, but before making connection to the existing mains, the system shall be pressure tested. The pressure test shall be performed on each section of water main. A section of water main shall be considered to consist of a length of pipe between two (2) valves.

.2 The purpose of the pressure test is to verify the integrity of all joints, pipes and valves.

.3 The Contractor shall provide all necessary labour, materials and equipment for the test including a suitable pump and measuring tank, pressure hoses, connection plugs, caps, gauges and all other apparatus necessary for filling the pipe, applying the required test pressure, and record the pressure losses.

.4 Water shall be used for testing. The Contractor shall provide temporary heating and additional insulation as required to keep the water in the pipe from freezing.

.5 Payment for the cost of testing shall be included in the unit price tendered for installation of the water main.

.6 The valves at each end of a section of pipe shall be closed and the pipe shall be filled with water at a gauge pressure of 1.5 times the series rating of the pipe. The test pressure shall be maintained for an initial period of 4 hours and then reduced by 70 kPa, then held at the reduced pressure for a second period of 1 hour minimum to 3 hours maximum duration. During the second period of the test, the joints on water main fittings, valves, hydrants, etc., in access vaults shall be inspected.

.7 The 70 kPa reduction in pipe pressure after 4 hours of pressurizing compensates for pipe stretch. No water loss allowance shall be made in the second period of the test for pipe stretch.

.8 When testing sections of the pipe, the pressure difference is to be maintained across the valve to test the valve. Therefore, two adjacent sections of pipe cannot be testing simultaneously.

.9 Upon completion of the pressure test, the flanged connection on the exterior of the access vault shall be retightened and the access vault backfilled.

.10 Certificates indicating satisfactory pressure testing must be provided with progress claims.

3.16 DISINFECTION OF WATER MAINS

.1 Prior to disinfection, all water mains shall be thoroughly flushed to remove any debris. The Contractor shall be responsible for making arrangements with the local municipal authority to use local municipal water for flushing.

.2 Before being placed into service, all new water mains shall be chlorinated throughout their entire length. The method to be used to introduce the disinfectant into the line must be approved by the Engineer and the Department of Health and conform to AWWA Standard C651-14. Depending on the chosen disinfection method, chlorine must be added to attain a concentration of 100 parts per million throughout the system and this solution will then be retained for 3 hours, after which time the chlorine concentration must not have dropped below 50 ppm (Slug Method) OR chlorine must be added to attain a concentration of 25 parts per million throughout the system and this solution will then be retained for 24 hours, after which time the chlorine concentration must not have dropped below 10 ppm (Continuous Feed Method). During chlorination, all valves and accessories shall be operated to assure thorough disinfection of all fittings.

.3 After chlorination is completed, the mains shall be flushed throughout until the replacement water is equal chemically and bacteriologically to the supply. Two testing options are acceptable: two (2) consecutive samples taken 16 hours apart OR after 16 hours stagnation, two (2) consecutive samples taken 15 minutes apart. These tests must be made in the presence of the Engineer. Satisfactory bacteriological test results must be obtained prior to commissioning the system.

.4 On completion of the chlorination of the mains, the Contractor shall set the system in operation and supply the necessary labour for the opening or closing of all valves as required or drain the system and pump all mains and services dry, as directed by the Engineer.

.5 The cost of disinfection and putting the mains into service pumping the mains and services dry shall be included in the unit price for the mains.

3.17 TEST FOR OBSTRUCTION

.1 Upon completion of backfilling, water mains shall be tested for obstructions. The Contractor shall provide and pay for all labour, tools, rope, pigs, lights and other equipment required to examine all work as required by the Engineer. The cost of this testing shall be included in the unit prices tendered for the installation of water mains.

.2 The water mains shall be tested for obstructions using a pig test. The pipes shall be deemed unobstructed if a wood or metal ball, having a diameter 19 mm less than the inside diameter of the pipe can be readily pulled through the line. This test shall be performed prior to flushing and chlorination.

3.18 JOINT TESTING

.1 The Owner reserves the right to visually inspect and test fusion joints using non-destructive methods.

3.19 INSPECTION CERTIFICATES

.1 Written inspection certificates shall be issued to the Contractor for various phases of the work after the work has been inspected by the Engineer and has been found to comply with the Plans and Specifications. Inspection certificates are required for work that is to be covered by other work or backfill.

.2 Payment shall not be made for work requiring an inspection certificate until the certificate has been issued by the Engineer. The Engineering shall issue an inspection certificate immediately after approval of a phase of the work.

.3 The issuance of an inspection certificate shall not relive the Contractor from his obligation to maintain the work or replace work subsequently found to be faulty.

.4 The temporary absence of the Engineer from the site shall not relive the Contractor from his obligation to obtain inspection certificates.

3.20 RELOCATION OF MAINS

.1 The Engineer has the right to relocate the mains throughout the project and he will advise the Contractor well in advance of the work if any such work is contemplated.

3.21 TRENCH INSULATION

.1 50mm thick, 2440mm Styrofoam HI-40 trench insulation boards should be laid side by side on 300mm compacted sand fill.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 20 00 – Measurement and Payment.

.2 Section 01 29 83 – Testing and Laboratory Services.

.3 Section 01 33 00 – Shop Drawings and Submittals.

.4 Section 01 35 30 – Health and Safety Requirements.

.5 Section 01 35 43 – Environmental Procedures.

.6 Section 01 45 00 – Quality Control.

.7 Section 01 51 00 – Temporary Utilities.

.8 Section 01 61 00 – Common Product Requirements.

.9 Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

.10 Section 01 74 23 – Closeout Submittals.

.11 Section 01 78 23 – Operation and Maintenance Manual.

.12 Section 01 78 39 – Project Record Drawings.

.13 Section 31 05 16 – Aggregates for Earthworks.

.14 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.15 Section 32 11 23 – Aggregate Base Courses.

.16 Section 33 14 16 – Site Water Utility Distribution Piping.

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM D698-12(2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft;)(600kN-m/m;)

1.3 WORK INCLUDED

.1 The work covered by this section shall include the supply and installation of sanitary sewer and sanitary sewer services including excavation, bedding, backfilling, compaction, and all associated work. All materials supplied are workmanship performed shall meet the requirement of the specifications and be guaranteed for the conditions of service applied to the project.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Polyethylene Pipe

.1 All polyethylene pipe shall be Series 160 (1103 kPa) high density polyethylene (HDPE) pipe with 75 mm urethane insulation encased in a 1.14 mm polyethylene black jacket.

.2 Where specified on the drawing for the sanitary sewer service to be metal jacketed, the above described pipe will be wrapped in 26 gauge galvanized steel jacket outside the polyethylene jacket.

.3 All polyethylene pipe, fittings, stub ends, etc. shall be of the same manufacturer's series, wall thickness, and the same grade of polyethylene. All gaskets will have the same internal diameter as the series pipe and all bolts and back up rings will be compatible to allow tightening without washers. Standard of acceptance shall be KWH Sclairpipe, Urecon UIP, or approved equal.

.4 No joints shall be allowed in piping covered with shop applied insulation.

.5 All jacketed pipe shall have a permanent factory applied marking indicating manufacturer, size and series identification at not greater than one metre intervals along its length, i.e. "Dupont 200 mm Series 160".

.2 Urethane Insulation

.1 Insulation for pipe lines, fittings, etc., shall be rigid closed cell polyurethane insulation to the thickness shown on the drawings. No joints shall be allowed in piping covered with shop applied insulation. Propertied of all urethane insulation shall be:

Density (kg per cubic meters core)	
ASTM D-1622	35
Compressive Strengths kPa @ 25℃ 10% Deflection measured axially	
ASTM D-1621-64	240
Thermal Conductivity W/m℃ @ 25℃	
ASTM D-2326-64T	0.0187
Operating temperature range ℃	
Cyrogenic to +	93
Closed cell content –	
% ASTM D-2856	90 min
Water absorption gm/1000 cc	
ASTM D-2842	12
Dimensional Stability, % ASTM	
D-2126 Procedure B & E	3

.3 Warning Tape

.1 The warning tape of sanitary sewers shall be 150 mm wide by 0.15 mm polyethylene tape. It shall be green in colour and have factory-applied marking at one metre intervals, i.e., “Caution Buried Sewer Line”.

.4 Field Joint Sleeves

.1 Wrap sleeves for field fusion joints and for flanged connections to vaults shall be 2.7 mm thick. Canusa Wrap LPW or equal. Each wrap will conform to the manufacturer’s recommended width and length for each size of pipe.

.5 Heat Shrink Tape:

.1 Heat shrink tape shall be 150 mm wide with the standard of acceptance being Raychem Thermoclad.

.6 Half Shells

.1 Half shells shall be made of urethane insulation with the properties as described in Section 2.2.1, and shall have thickness equivalent to the urethane insulation on the pipe.

.7 Field Applied Urethane

.1 Field applied urethane shall be “Portaform” manufactured by Insta-Foam Products Inc., or equivalent.

.8 Pipe Bedding

.1 Pipe bedding shall be sand conforming to the specifications for modified Granular “C”, as listed in Section 31 05 16: Aggregates for Earthworks.

.9 Valves, Couplings, & Fittings

.1 Valves, couplings, and fittings shall be compression type designated for use with polyethylene piping and properly sized for the pipe used. All connections will include stainless steel inserts 50 mm long and tight fitting within the service pipe. Longitudinally split inserts will not be accepted.

.10 Trench Insulation

.1 Trench insulation shall be Styrofoam HI-40, 2440mm wide 50mm thick Granular Backfill

.11 Sanitary Service Saddle

.1 Sanitary sewer service saddles shall be Dupont stainless steel (TS-8-4 or TS-10-4) with rubber gaskets and couplings (or approved equal).

PART 3 EXECUTION

3.1 DRAINAGE

.1 The Contractor shall keep all portions of the work properly and efficiently drained during construction and until completion. He shall be held responsible for all damage that may

be caused as the result of water backing up or flowing over, through, from, or along any part of the work or surrounding properties due to his operation.

.2 Work shall be carried out in a dry trench. In no case shall water be allowed to run over the invert, reach the joints, or run through the pipe or culvert sections during construction.

3.2 SITE RESTRICTIONS

.1 When planning the work, the Contractor shall make due allowance for the presence of the existing structures, access, utilities and the operation of others on the site.

.2 Supports, adequate protection and maintenance of all existing underground and surface utility structures, drains, sewers, ducts conduits, power poles and other obstructions encountered during the progress of work, shall be provided by the Contractor at his own expense.

3.3 RELOCATION OF MAINS

.1 The Engineer has the right to relocate the mains throughout the project and he will advise the Contractor well in advance of the work if any such move is contemplated.

3.4 SERVICE CONNECTIONS

.1 Excavation, bedding, backfilling, urethane insulation, piping insulation system, and styrofoam used in the installation of service connection shall conform to the same requirements as for main line installation.

.2 The corresponding sections of the specification are to be read in conjunction with this section.

3.5 INSPECTION

.1 All material is subject to inspection and testing for soundness and suitability at the discretion of the Engineer.

.2 All works shall be undertaken in strict adherence to the manufacturer’s instructions, which are considered as being part of the Specifications. As each section of the work is completed, it shall be tested in the manner specified, and in the presence of, and as approved by, the Engineer.

.3 All material found, during the progress of the work, to have cracks, flaws, or other defects, or to be of doubtful quality will be rejected by the Engineer. All rejected materials shall be promptly removed from the site of the work by the Contractor and all costs associated with the removal and replacement of rejected material shall be borne by the Contractor.

3.6 HANDLING OF MATERIAL

.1 All material shall be delivered and distributed at the site by the Contractor. All pipe and accessories shall be loaded and unloaded by lifting manually or with hoists so as to avoid shock or damage. Under no circumstances shall such materials be dropped.

.2 In distributing the polyethylene pipe at the site of the work, each piece shall be unloaded opposite or near the place where it is to be installed.

.3 Pipe shall be handled so the exterior and interior surfaces, prefabricated joints, insulation etc., will not be damaged. If, however, any part of any surface, coating or lining is damaged, the repair shall be made by the Contractor at his own expense, in a manner satisfactory to the Engineer.

3.7 ALIGNMENT AND GRADE

.1 All pipe sections shall be laid and maintained to the required lines and grades, with fittings, valves, access vault etc., at the proper locations and grade with joints centered.

.2 No deviated from the authorized lines and grades shall be made without the written approval of the Engineer. If, in the opinion of the Engineer, the Contractor's method of setting grades is inaccurate or insufficient, the Engineer may direct that more suitable equipment and methods be used to insure that proper grades are established.

3.8 WATER IN EXCAVATION

.1 Work shall be carried out in a dry trench. In no case shall water be allowed to run over the invert, reach the joints, or run through the pipe during construction.

.2 The expense of removing the water, regardless of origin, is the responsibility of the Contractor. The Contractor shall be wholly responsible for any damage that may occur due to ground water or storm water entering the trench during the period of construction.

3.9 TRENCHING BY HAND

.1 In any location where the use of trench digging machinery might cause property or utility damage the Contractor shall carry out the trenching by hand at no extra cost to the Owner.

3.10 PIPE BEDDING

.1 Insulated piping shall be bedded in modified Granular "C" with a minimum of 0.15 m below the insulation, 0.15 m on both sides and 0.3 m above the insulation of the piping. Mechanical tamping of the pipe bedding shall be carried out in 0.15m loose layers.

.2 The pipe bedding shall be compacted to 95% Standard Proctor Dry Density as per ASTM D698-07el.

.3 Bedding shall be deemed unsatisfactory if, in the opinion of the Engineer, proper compaction cannot be obtained because of the presence of water.

.4 No extra payment shall be made for the replacement of bedding that has become unsatisfactory due to water from any source.

3.11 WARNING TAPE

.1 A continuous run of "warning" tape shall be laid on the pipe bedding 0.6m directly above the water main.

3.12 FIELD APPLIED URETHANE

.1 Field spraying of urethane will be carried out by experienced operators only using “Insta-Foam Froth-Pak” kits or approved equal. Exposed urethane shall be coated with 1 mm of Flint Kote-Superior Asphalt Mastic No. 110-14 and heat shrink sleeves. Where geometry does not permit the use of heat shrink sleeves, two layers of Raychem Thermoclad 150 mm wide tape with 50% overlap shall be used.

3.13 PIPE LAYING

.1 Lengths of polyethylene pipe sanitary sewer mains to be laid between flanged fittings on access vaults shall be assembled on dry ground by butt-fusion, complete with flanged ends. The pipe shall be pressure tested (as described in Clause 3.15) and installation of urethane half shells shall be installed on the ends of mains prior to installation in the trench and shall only be removed immediately prior to connection to the access vault.

.2 The sanitary sewer mains shall be laid to the alignment and the grades shown on the drawings.

.3 It is prohibited to drag pipe over the ground which would damage the black jacket or insulation. If the pipe or fused sections of pipe are to be moved, they must be supported on rollers or completely suspended.

.4 Slings used to lower the insulated pipe into the trench shall support the pipe without causing damage to the jacketing insulation (see Clause 3.5).

3.14 PIPE JOINTS

.1 The insulation shall be cut back 190 mm, as shown on the drawing to allow for the field joining of the pipe. Care shall be taken, when cutting away insulation from the pipe, not to cut the pipe beneath the insulation. Cut pipe shall be rejected from the work. Field cut insulation shall be treated with mastic.

.2 Thermal butt-fusion of polyethylene pipe shall be carried out as recommended by the supplier, but only by a certified butt-fusion technician.

.3 When joining the sections of the pipe, it is the fusion equipment, which must be moved from joint to joint.

.4 Where the drawings call for the use of heat shrink tape or where the geometry of bends and fittings prevents the installation of heat shrink sleeves over the insulation then two wrappings of heat shrink tape in 150 mm widths shall be applied. The first complete wrapping shall be applied and shrunk down before the second wrapping is applied. The tape shall overlap 50% as it is wrapped around the pipe of fitting. These methods shall be used to repair all damage to insulation jacketing.

3.15 PRESSURE TESTING OF POLYETHYLENE PIPE

.1 A pressure test shall be performed on each section of sewer main, before the insulation of the joints or installation in the trench. A section of sewer main shall be considered to consist of a length of pipe between two flange fittings.

.2 The purpose of the pressure test is to verify all joint and pipe integrity.

.3 The Contractor shall provide all necessary labour, materials and equipment for the test including a suitable pump and measuring tank, pressure hoses, connection plugs, caps, gauges and all other apparatus necessary for filling the pipe, applying required test pressure, and recording the pressure losses.

.4 Water shall be used for testing. The Contractor shall provide temporary heating and additional insulation as required to keep the water in the pipe from freezing.

.5 Payment for the cost of testing shall be included in the unit price tendered for installation of the sewer main.

.6 The ends of the pipe to be tested shall be sealed off using blind flanges and gaskets. The flange on the lower end of the pipe shall be tapped to receive the test pump discharge line, and the flange on the high end of the pipe shall be tapped to receive a vent cock to discharge air from the line during the filling process. The pipe shall be laid to a continuously rising grade to the vent cock.

.7 The pipe shall be filled with water at a gauge pressure of 1.5 times the series rating of the pipe, and maintained for one hour. No pressure drop will be allowed during this period. All leaks or defective material shall be repaired to the Engineer's requirements, or replaced. Any section requiring repairs shall be retested.

3.16 TEST FOR OBSTRUCTIONS

.1 Upon completion of backfilling, sewer mains shall be tested for obstructions. The Contractor shall provide and pay for all labour, tools, ropes, pigs, lights and other equipment required to examine all work as required by the Engineer. The cost of this testing shall be included in the unit prices tendered for the installation of the sewer mains.

.2 The sewer mains shall be tested for obstructions using a pig test. The pipes shall be deemed unobstructed if a wood or metal ball, having a diameter 19 mm or less than the inside diameter of the pipe, can be readily pulled through the line.

3.17 TV INSPECTION OF SEWER MAINS

.1 It is brought to the attention of the Contractor that the Owner reserves the right to have a complete TV inspection done, on completion of the project, of the installed sewer mains. The cost of such TV inspection shall be borne by the Owner. Deficiencies noted by means of the TV inspection shall be rectified by the Contractor at his own expense.

3.18 FLUSHING

.1 Sewer mains to be flushed with a minimum flow of 1.5m/s with in the pipe for the duration of 10 minutes or until all foreign materials have been removed and flushed water is clear.

.2 Flushing operations shall be performed under the direction of the Engineer. Provide 48 hours notice prior to start of flushing operations.

3.19 JOINT TESTING

.1 The Owner reserves the right to visually inspect and test fusion joints using non-destructive methods and visual inspection.

3.20 INSPECTION CERTIFICATES

.1 Written inspection certificates shall be issued to the Contractor for various phases of the work after the work has been inspected by the Engineer and has been found to comply with the Plans and Specifications. Inspection certificates are required for work that is to be covered by other work or backfill.

.2 Payment shall not be made for work requiring an inspection certificate until the certificate has been issued to the Engineer. The Engineer shall issue and inspection certificate immediately after approval of a phase of the work.

.3 The issuance of an inspection certificate shall not relieve the Contractor from his obligation to maintain the work or replace work subsequently found to be faulty.

.4 The temporary absence of the Engineer from the site shall not relieve the Contractor from his obligation to obtain inspection certificates.

3.21 TRENCH INSULATION

.1 50mm thick, 2440mm Dow Chemical Company Styrofoam HI-40 trench insulation boards should be laid side by side on 300mm compacted sand fill.

END OF SECTION

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 Measure supply and installation of pipe culvert including excavation and backfill in metres in place for each size, type and class of pipe. There shall be no direct cost associated with this section. Include cost in lump sum bid price.

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 DELIVERY, STORAGE AND HANDLING

.1 See Section 01 61 00 – Common Product Requirements.

PART 2 PRODUCTS

.1 As per details in Issued for Tender drawing package or Engineer approved equivalent.

.2 Granular bedding and backfill material to Section 31 05 16 – Aggregates for Earthworks.

PART 3 EXECUTION

3.1 TRENCHING

.1 Do trenching Work in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.2 Obtain Engineer's approval of trench line and depth prior to placing bedding material or pipe.

3.2 BEDDING

.1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place 150 mm minimum thickness of approved granular material on bottom of excavation as detailed on contract drawings and compact to 95% minimum of corrected maximum dry density.

.3 Place bedding in unfrozen condition.

3.3 LAYING CSP & HDPE PIPE CULVERTS

.1 Begin laying at downstream end of culvert.

.2 Install pipe in trench by lowering.

.3 Ensure bottom of pipe is in contact with bedding throughout pipe length.

.4 Allow water to flow through pipes during construction only as permitted by Engineer.

3.4 JOINTS CULVERTS

.1 Install couplings in accordance with manufacturer's instructions.

3.5 BACKFILLING

.1 See Section 31 23 33.01 Excavating, Trenching and Backfilling.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 16 Cleaning and Site Maintenance

.3

1.2 MEASUREMENT AND PAYMENT

.1 Measure erection of roadside steel W-beam guide rail including posts and necessary hardware in metres of guide rail installed and measured from outer tips of steel W-beam guide rail, including guide rail used in anchorages and terminal sections.

1.3 REFERENCE STANDARDS

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M180-[2000 (2004)], Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrails.

.2 ASTM International

.1 ASTM A123/A123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A307-[07b], Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

.3 CSA Group (CSA)

.1 CAN/CSA O80 Series-[08], Wood Preservation.

.4 United States Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for guide rail, wood, and coatings and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings of W-beam and post and rail installation for approval by Consultant.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect guide rails from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Steel W-beam guide rail as indicated and as follows:

.1 Steel rail and terminal sections: to AASHTO M180, class A Type 1 zinc coated.

.2 Bolts, nuts and washers: to ASTM A307, hot dip galvanized to ASTM A123/A123M.

.3 Standard Type (W-beam) consisting of 2.75 mm thick rail. The length shall not be less than 4125 mm, having post bolt slots 3810 mm apart centre to centre.

.4 Workmanship shall be equivalent to good commercial practice and all edges, boltholes and surfaces shall be free of torn metal, burns, sharp edges and protrusions.

.2 Sawn timber posts:

.1 Timber for posts and anchors shall be sound, well-seasoned structural grade lumber. Only birch wood will be acceptable for 150 mm x 150 mm guide rail posts. Hemlock or other approved species will be acceptable for 200 mm x 200 mm guide rail posts.

.2 Anchors shall consist of either one piece of guide rail post cut 450 mm long, or two pieces of 38 mm x 140 mm x 450 mm lumber.

.3 Posts and anchors shall be pressure treated with an acceptable wood preservative The minimum required depth of penetration of wood preservative shall be 13 mm. To determine penetration, a borer core shall be taken from 20 pieces in each charge. If 80% of the borings meet the penetration requirements, the charge shall be accepted.

.3 Wood Preservative

.1 Wood preservative for use in treating field cut ends of posts shall be of the same type and chemical composition as that used in the original treatment.

.4 Signal Reflectors

.1 Silver signal reflectors and yellow signal reflectors shall be of size 75 mm x 100 mm.

.2 Nails for securing signal reflectors shall consist of 30 mm galvanized flat head nails.

.5 Bolts, Nuts, Washers and Spikes

.1 All bolts, nuts and washers shall conform to the specifications of ASTM A307 or F3125M, except that rail splice bolts shall be button headed.

.2 Post bolts and splice bolts shall have shoulders of such shape and size that they fit into the bolt slots in the rails and thus prevent the bolt from turning.

.3 Post bolts shall be 16 mm diameter and 200 mm long for use with standard 150 mm x 150 mm posts, or 16 mm diameter and 250 mm long for use with 200 mm x 200 mm posts.

.4 Post bolt washers for the back of posts shall be 45 mm in diameter and 4 mm thick.

.5 Bolts for anchors shall be 16 mm diameter and 350 mm long for use with standard 150 mm x 150 mm posts and anchors, or 16 mm diameter and 450 mm long for use with 200 mm x 200 mm posts and anchors. Washers shall be 45 mm round and 4 mm thick.

.6 Spikes for anchors shall be 125 mm galvanized spikes.

.7 Bolts, nuts, washers and other fittings shall be hot-dip galvanized in accordance with ASTM A153 “Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.”

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for guide rail installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 ERECTION

.1 Set posts by instrument for alignment, and locations as indicated.

.2 Excavate post holes to depths as indicated and to diameter of 360 mm plus or minus 20 mm.

.1 Compact bottom to provide firm foundation.

.2 Set post plumb and square in hole.

.3 Backfill around posts using excavated material and compact in uniform layers not exceeding 300 mm compacted thickness.

.4 Leave or make depression approximately 150 mm deep around posts until painting is completed, then fill and compact to ground elevation.

.5 Cut off tops of posts as indicated.

.6 Worker protection: ensure workers wear protective clothing, eye protection and respirators when handling, drilling, sawing, cutting or sanding preservative treated wood and applying preservative materials.

.7 Treat cut tops and cut ends with 2 coats of the same type and chemical composition as that used in the original treatment.

.8 Erect steel W-beam components to details as indicated. Lap joints in direction of traffic.

.1 Tighten nuts to 100 N.m torque.

.1 Maximum protrusion of bolt 12 mm beyond nut.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 16 Cleaning and Site Maintenance

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 16 Cleaning and Site Maintenance.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by guide rail installation.

END OF SECTION

CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACEMENTS

Iqaluit

IQALUIT, NUNAVUT, CANADA

DILLON PROJECT: 24-8833
DATE: SEPTEMBER 4, 2026
ISSUED FOR TENDER

DILLON CONSULTING

ISSUED FOR TENDER

Sheet List Table	
Sheet Number	Sheet Title
C0	COVER PAGE
C1	GENERAL LOCATION PLAN
C2	NIPISA STREET EXISTING CONDITIONS AND REMOVALS
C3	NIPISA STREET PLAN
C4	NIPISA STREET SECTIONS
C5	QUENN ELIZABETH II WAY EXISTING CONDITIONS AND REMOVALS
C6	QUEEN ELIZABETH II WAY PLAN AND PROFILE
C7	QUEEN ELIZABETH II WAY PROFILES
C8	QUEEN ELIZABETH II WAY CULVERT DETAILS
C9	SECTIONS AND DETAILS
C10	GUIDE RAIL POST DETAILS
S2.1	NIPISA STREET BOX CULVERT DESIGN
S3.1	QUEEN ELIZABETH II WAY BOX CULVERT DESIGN



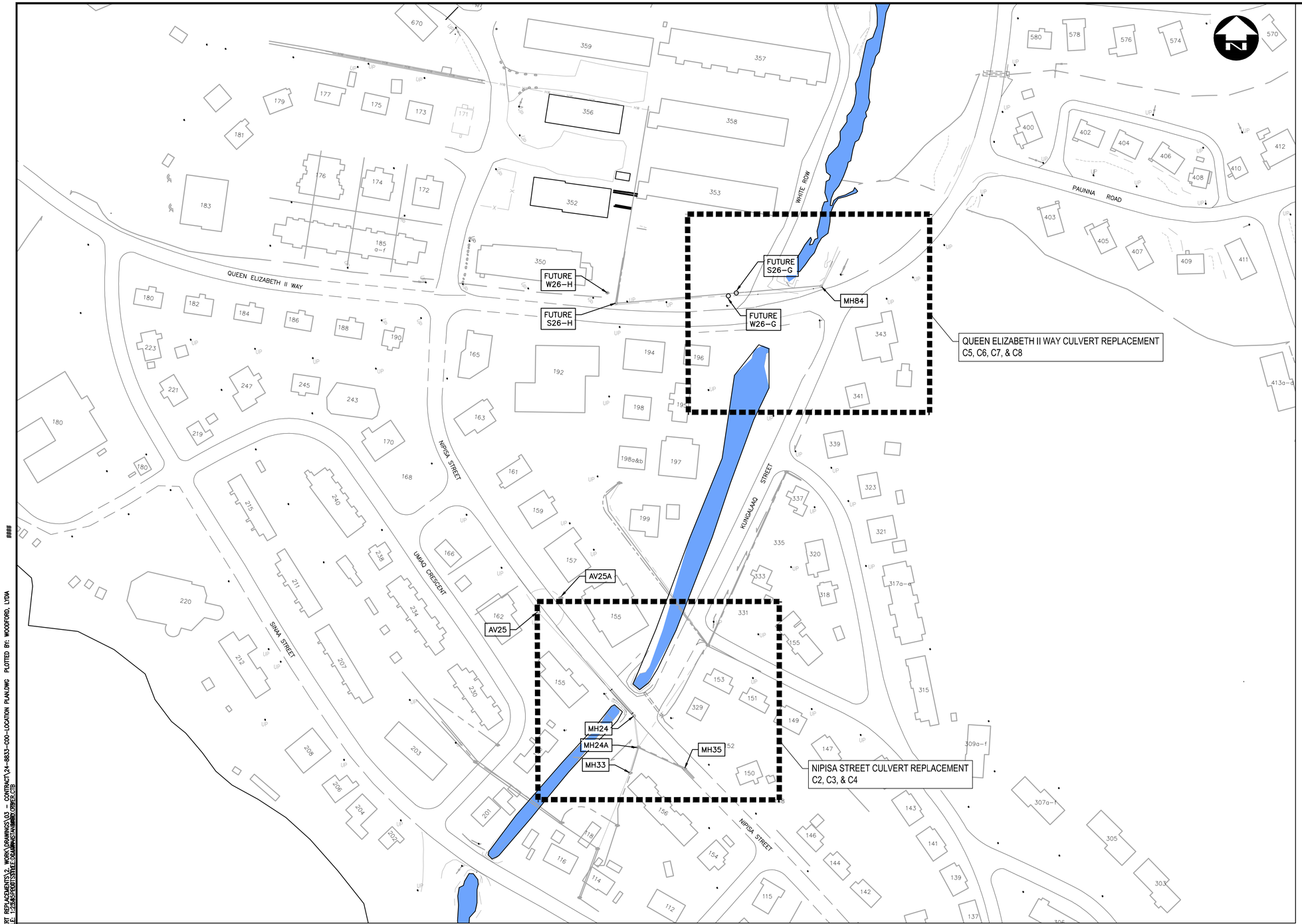
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FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 - CONTRACT\24-8833-00-COVER SHEET.DWG PLOTTED BY: WOODFORD, LYDIA
PLOT DATE: 2026-09-02 @ 1:41:16 PM PLOT SCALE: 1:25.4 PLOT STYLE: DILLON-STANDARD.CTB



GENERAL LOCATION PLAN

SCALE 1:1,000 — 20 0 20 METRES

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO PROCEEDING WITH THE WORK AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. ALL SURVEY MONUMENTS DISTURBED BY CONSTRUCTION SHALL BE REINSTATED.
3. ELEVATIONS SHOWN ON DRAWINGS ARE BASED ON GEODETIC DATA, BENCHMARKS: AS INDICATED ON SURVEY CONTROL POINTS TABLE ON THIS DRAWING
4. THIS PROJECT'S SCOPE OF WORK MAY OVERLAP SPATIALLY OR TEMPORALLY WITH THE ADJACENT/ CONCURRENT UTILIDOR PROJECT. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION SCHEDULES, SITE ACCESS, WORK ZONES, UTILITY TIE-INS, AND STAGING AREAS WITH THE UTILIDOR PROJECT TEAM TO PREVENT CONFLICTS, AVOID DELAYS, AND ENSURE SITE SAFETY THROUGHOUT CONSTRUCTION.
5. CONTRACTOR SHALL PROVIDE ALL TEMPORARY SIGNAGE FOR PEDESTRIAN AND TRAFFIC REROUTING AS REQUIRED.
6. ACCESS TO EXISTING PROPERTIES AND BUSINESSES SHALL BE MAINTAINED AT ALL TIMES.
7. LOCATION OF EXISTING SERVICES, UNDERGROUND INFRASTRUCTURE, STRUCTURES, AND BUILDINGS ARE APPROXIMATE ONLY AND ARE TO BE LOCATED BY NON-DESTRUCTIVE TESTING AND CONFIRMED IN THE FIELD BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS.
8. CONTRACTOR TO CONTACT UTILITY COMPANIES REGARDING ANY UNDERGROUND UTILITIES IN THE AREA OF WORKS. CONTRACTOR SHALL USE CAUTION TO LOCATE EXISTING UNDERGROUND POWER AND TELECOMMUNICATIONS LINES. LINES SHALL BE KEPT IN SERVICE WHERE TRENCHING CROSSES UNDERGROUND LINES. CONTRACTOR SHALL SUBMIT SUPPORT AND BRACING DETAILS TO ENGINEER FOR APPROVAL PRIOR TO UNDERMINING POWER AND TELECOMMUNICATION LINES.
9. DEMOLISHED CONCRETE, PIPE, CONTAMINATED SOILS, AND OTHER UNSUITABLE MATERIALS MUST BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR AT A DISPOSAL SITE APPROVED BY THE GOVERNMENT OF NUNAVUT. PAYMENT FOR DISPOSAL TO BE MADE UNDER CASH ALLOWANCE.
10. ROCK REMOVAL, IF REQUIRED, SHALL BE CARRIED OUT BY MECHANICAL MEANS ONLY. THE USE OF EXPLOSIVES IS NOT PERMITTED ON SITE.
11. ALL EXISTING AREAS AND INFRASTRUCTURE DISTURBED BY CONTRACTOR'S OPERATIONS WHICH ARE NOT DESIGNATED TO BE RELOCATED OR RECONSTRUCTED SHALL BE REINSTATED TO PRE-CONSTRUCTION CONDITION OR BETTER, AS RECORDED IN THE PRE-CONSTRUCTION SITE REPORT. THERE SHALL BE NO ADDITIONAL PAYMENT FOR REINSTATEMENT OF SUCH.
12. THE CONTRACTOR SHALL SUBMIT A COMPREHENSIVE CONSTRUCTION AND COMMISSIONING PLAN. AT A MINIMUM, THE PLAN SHALL INCLUDE:
    - CONSTRUCTION PHASING PLANS
    - COMMISSIONING PHASING PLANS
    - TRAFFIC CONTROL PLANS
    - LIFTING PLANS FOR CULVERT INSTALLATIONS
    - STREAM DIVERSION PLANS
    - EROSION AND SEDIMENT CONTROL PLANS
12. THE CONTRACTOR SHALL SEAL ALL ABANDONED WATER AND SEWER PIPES WITH A WATER TIGHT PLUG AND FILL WITH FLOWABLE GROUT. EXACT LOCATIONS TO BE SURVEYED AND PROVIDED TO OWNER PRIOR TO BACKFILLING.
13. PUMPED BYPASS OF SANITARY FLOW REQUIRED AROUND AREA OF CONSTRUCTION, PROPOSED BY-PASS PLAN TO BE PROVIDED MINIMUM 2 WEEKS PRIOR TO CONSTRUCTION FOR REVIEW AND APPROVAL. BY-PASS PLAN SHALL INCLUDE THE USE OF GRINDER PUMPS. BACKUP POWER MUST BE PROVIDED TO ENSURE 24 HOUR OPERATION.
14. THE CONTRACTOR SHALL MAINTAIN THE PRIMARY AND BACKUP PUMPS FOR SANITARY SEWER FLOW, AND NO POOLING OR SURCHARGE OF SANITARY SEWAGE SHALL BE PERMITTED AT ANY TIME.
15. WHERE NEW WATER MAINS ARE TO BE RECONNECTED TO EXISTING SYSTEMS THE CONTRACTOR MUST PROVIDE 48 HOURS NOTICE TO THE ENGINEER IF THE SYSTEM MUST BE SHUT DOWN TO MAKE THE CONNECTION. THE CONNECTION MUST BE MADE IN SUCH A WAY AS TO MINIMIZE DISRUPTION OF THE SERVICE. CONTRACTOR MUST, IN CONJUNCTION WITH CITY STAFF VERIFY OPERATION OF WATER MAIN VALVES REQUIRED FOR SHUT-OFF OF WATER PRIOR TO CARRYING OUT WATER MAIN CONNECTIONS.
16. THE CONTRACTOR TO PROVIDE TEMPORARY UTILITIES TO MAINTAIN FLOW TO HYDRANTS AND EXISTING DWELLINGS AFFECTED BY THE WORK. CONTRACTOR TO SUBMIT A PLAN TO ENGINEER FOR APPROVAL PRIOR TO PROCEEDING WITH WORK.
17. IF NEW PAVING IS TO TIE INTO EXISTING GRAVEL ROADS, THE CONTRACTOR SHALL ADD 90mm OF GRANULAR 'A' TO TIE INTO EXISTING ROAD GRADE.
18. EXCAVATIONS SHALL COMPLY WITH CURRENT OCCUPATIONAL HEALTH AND SAFETY ACT
19. ANY WATER PUMPED FROM THE CONSTRUCTION AREA SHALL BE PUMPED DOWN USING A SETTLEMENT POND AND FILTERING BAGS TO REMOVE ANY SEDIMENT FROM THE WATER BEFORE LEAVING THE SITE.
20. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF GRADE BEAMS OR BOX CULVERTS UNLESS THE ENGINEER OF RECORD OR APPROVED REPRESENTATIVE IS ON SITE.
21. THE CONTRACTOR SHALL PROVIDE THE THE ENGINEER AS-BUILT SURVEY INFORMATION AT THE TOP OF THE CULVERTS EVERY 5 METERS AND AT BOTH ENDS OF THE CULVERT FOR ACCEPTANCE PRIOR TO BACKFILLING. IF THE ALIGNMENT IS FOUND TO BE UNACCEPTABLE AND THE CULVERT IS BACKFILLED, THE CONTRACTOR SHALL EXCAVATE THE TRENCH AND FIX THE WORK AT THEIR OWN EXPENSE.

SURVEY CONTROL:

NORTHING	EASTING	ELEVATION	CONTROL MONUMENT NO.
7068349.224	522488.479	38.71	CCM3
7067616.303	522955.168	35.208	CCM4
7070285.229	522960.322	55.231	CCM46
7069841.593	523217.707	26.499	CCM8
7069091.491	524068.735	55.817	CCM17
7068685.633	524389.529	40.566	CCM21
7069061.855	524652.711	71.837	CCM23A
7068768.253	524890.145	86.677	CCM25
7068443.017	525103.656	102.456	CCM26
7068622.873	525561.309	117.526	CCM28
7068019.707	526047.243	119.397	CCM29
7066445.991	527146.353	62.088	CCM30
7068512.444	524504.331	59.186	CCM47
7069296.29	523858.192	32.278	CCM48

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PERMIT TO PRACTICE
DILLON CONSULTING LIMITED
Signature
Date September 4, 2026
PERMIT NUMBER: P 010
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
S.J. GREELEY
LICENSEE
09-04-2026
NT/NU

ISSUED FOR TENDER

Iqaluit

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
1	ISSUE FOR TENDER	09-04-2026	SJG

DESIGN SJG | REVIEWED BY SJG
DRAWN MWC | CHECKED BY LW
DATE SEPTEMBER 2026
SCALE 1:1000

CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

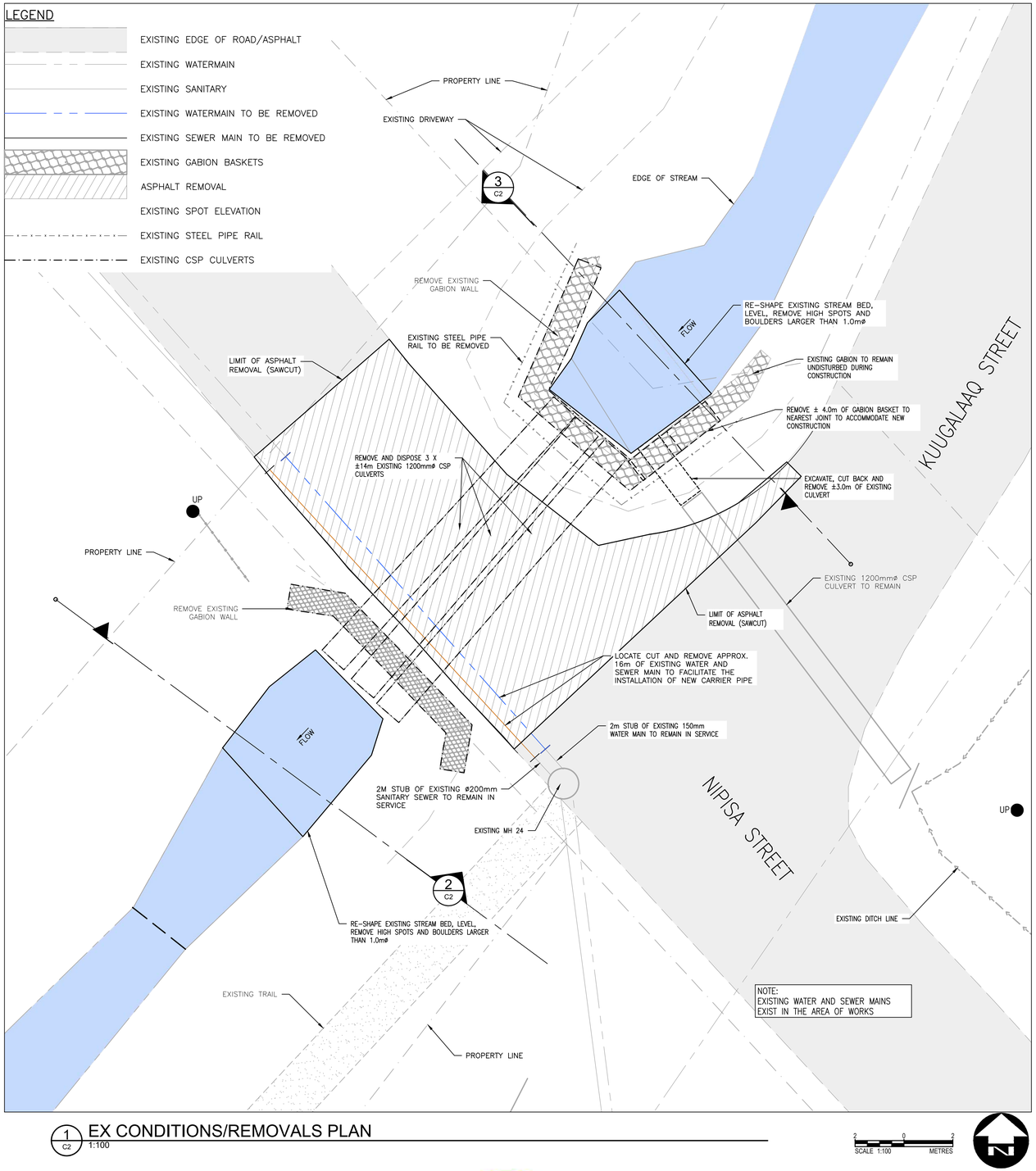
GENERAL LOCATION PLAN

SHEET NO. C1

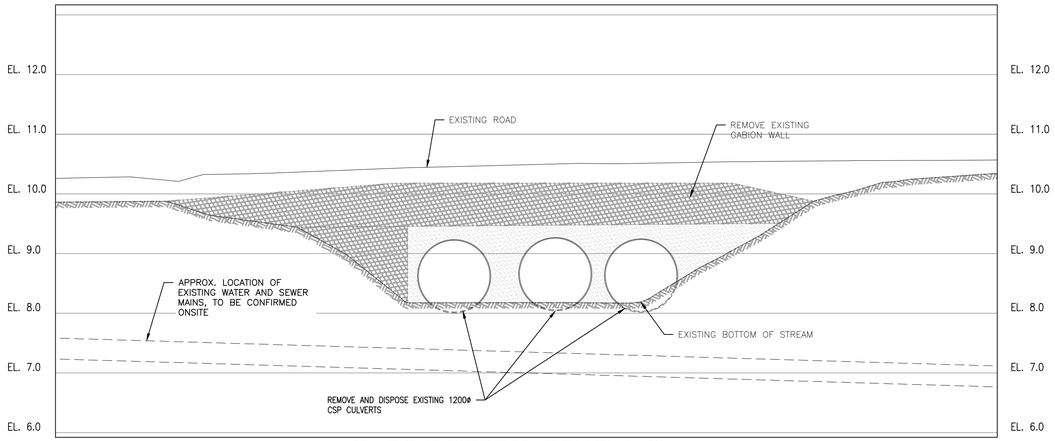
FILENAME: P:\2024\24-8833 NIPISA AND QEW CULVERT REPLACEMENTS\2_WORK\DRAWINGS\03 - CONTRACT\24-8833-C00-LOCATION PLAN.DWG PLOTTED BY: WOODFORD, LYDIA
PLOT DATE: 2026-09-02 @ 1:48:39 PM PLOT SCALE: 1:250 PC-001 SYSTEM: PLAN-MASTER-ANSI-D.CTB

LEGEND

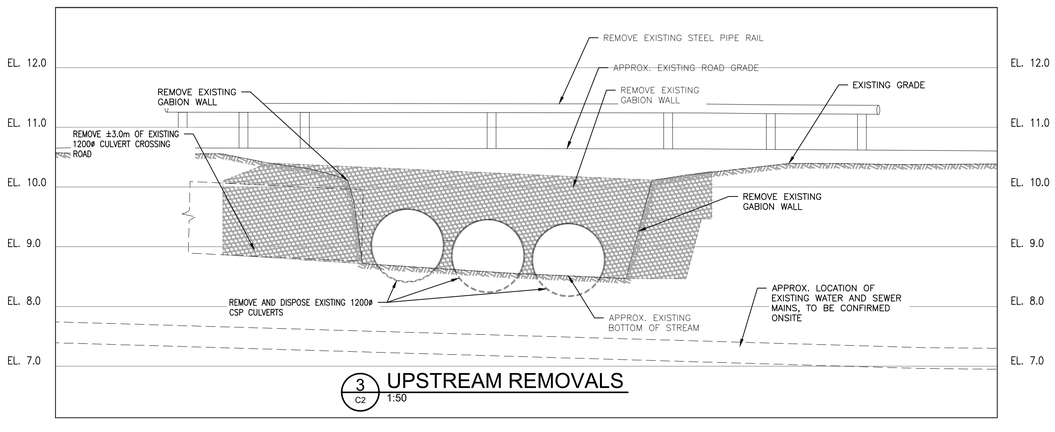
- EXISTING EDGE OF ROAD/ASPHALT
- EXISTING WATERMAIN
- EXISTING SANITARY
- EXISTING WATERMAIN TO BE REMOVED
- EXISTING SEWER MAIN TO BE REMOVED
- EXISTING GABION BASKETS
- ASPHALT REMOVAL
- EXISTING SPOT ELEVATION
- EXISTING STEEL PIPE RAIL
- EXISTING CSP CULVERTS



1 C2 EX CONDITIONS/REMOVALS PLAN
1:100



2 C2 DOWNSTREAM REMOVALS
1:50



3 C2 UPSTREAM REMOVALS
1:50



UPSTREAM / LOOKING SOUTH-WEST

NOTE:
1. CONTRACTOR TO OBTAIN ALL PERMITS AND APPROVALS OF AUTHORITY HAVING JURISDICTION FOR ALL WORK BELOW THE HIGH WATER LEVEL OF THE STREAM.



RE-SHAPE EXISTING STREAM BED, LEVEL, REMOVE HIGH SPOTS AND BOULDERS LARGER THAN 1.0mø

DOWNSTREAM / LOOKING NORTH-EAST

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PERMIT NUMBER: P 010
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REGISTERED PROFESSIONAL ENGINEER
S.J. GREELEY
LICENSEE
09-04-2026
NT/NU

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CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

NIPISA STREET
EXISTING CONDITIONS AND REMOVALS

SHEET NO. C2

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 - CONTRACT\248833-02-RDA-CON_bulDWG C:\USERS\MWC\APPDATA\LOCAL\TEMP\ACPUBLISH_6076\248833-02-RDA-CON_bulDWG
PLOT DATE: 2026-09-02 @ 1:57:10 PM PLOT SCALE: 1:25 PLOTTED BY: MWC
DILLON CONSULTING LIMITED, 5 VAUGHAN CRESCENT, IQALUIT, NUNAVUT, X0A 0T0 | 1558 WILLSON PLACE, SUITE 200, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209

ALL GUIDERAIL END TREATMENTS TO BE VALTIR SRT-350 OR APPROVED EQUAL

EXISTING WATER AND SEWER MAINS

APPROXIMATE EXTENT OF REINSTATEMENT

EXISTING UTILITY POLE

0+000

13.5m N.T.S.

3 C4

2 C4

NEW ROADWAY SHOULDER TO TIE INTO EXISTING (TYP.)

EXISTING PROPERTY LINES

0+016

4 C4

REGRADE EXISTING DRIVEWAY, ENSURE SMOOTH TRANSITION USING 150mm OF GRANULAR 'A'

NEW 26m LONG GUIDERAIL SEE DETAIL SHEET C10

NEW 16m ø200mm HDPE SAN SEWER C/W VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS

NEW 16m ø150mm HDPE WATER MAIN C/W VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS

TIE-INTO TO EXISTING GRADE. MAX SLOPE 3:1

INSTALL NEW 2 TIER X 3 WIDE GABION WALL

INSTALL NEW 2 TIER X 5 WIDE GABION WALL

3:1 SLOPE TO EXISTING GRADE

EDGE OF GRAVEL SHOULDER

TOP OF BASKETS

0.00%

34.12%

2.0% (TYP.)

RE-SHAPE EXISTING STREAM BED, LEVEL, REMOVE HIGH SPOTS AND BOULDERS LARGER THAN 1.0mø. INSTALL 250mm OF 150-250mø COBBLE

TOP OF CURB

0+010

0+000

FLOW

0+019.391

EDGE OF STREAM

EXISTING GABION WALL TO REMAIN UNDISTURBED DURING CONSTRUCTION

INSTALL ±15m CONCRETE BOX CULVERT

0+025

2X NEW 10m ø450mm HDPE CARRIER PIPE FOR NEW ø200mm SANITARY AND ø150mm WATER MAIN

INSTALL 3m OF NEW 1200mmø CSP CULVERT C/W COLLAR. CONNECT TO EXISTING CULVERT

INSTALL NEW 2 TIER X 4 WIDE GABION WALL

NEW ROADWAY SHOULDER TO TIE INTO EXISTING (TYP.)

13.5m

NEW 30m LONG GUIDERAIL SEE DETAIL SHEET C10. GUARDRAIL END TREATMENT SHALL BE STR-350. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND APPLICABLE STANDARDS

EXISTING TRAIL

APPROX. EXTENT OF REGRADING, MAX SLOPE 3:1

EXISTING 2m STUB OF ø150mm WATER MAIN TO REMAIN

EXISTING 2m STUB OF ø200mm SANITARY MAIN TO REMAIN

EXISTING MH 24 TO REMAIN

NIPISA STREET

APPROXIMATE EXTENT OF REINSTATEMENT

EXISTING 1200ø CULVERT TO REMAIN

SCALE 1:50 0 1 METRES

NOTE:

1) CONTRACTOR TO COMPLETE ALL WORK IN THE DRY. CONTRACTOR TO SUBMIT PLAN TO DIVERT STREAM FLOWS TO ALLOW WORK TO BE DONE IN THE DRY
2) SIZES, LOCATIONS AND ELEVATIONS OF EXISTING SERVICES APPROXIMATE. EXACT LOCATION TO BE CONFIRMED IN THE FIELD. DAYLIGHT EXISTING SERVICES BY NON-MECHANICAL MEANS.
3) SERVICES ARE TO BE KEPT IN SERVICE DURING CONSTRUCTION AT THE CONTRACTOR'S EXPENSE.

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SCALE 1:50

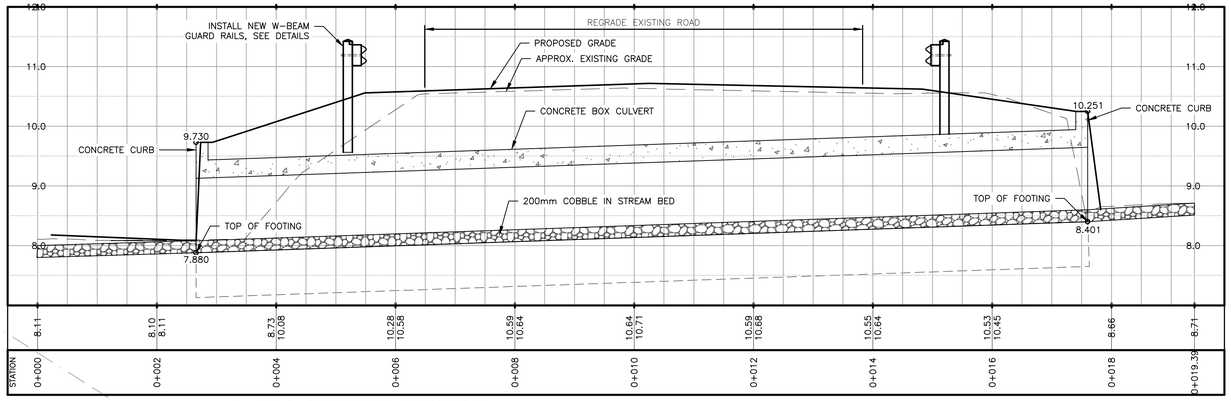
CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

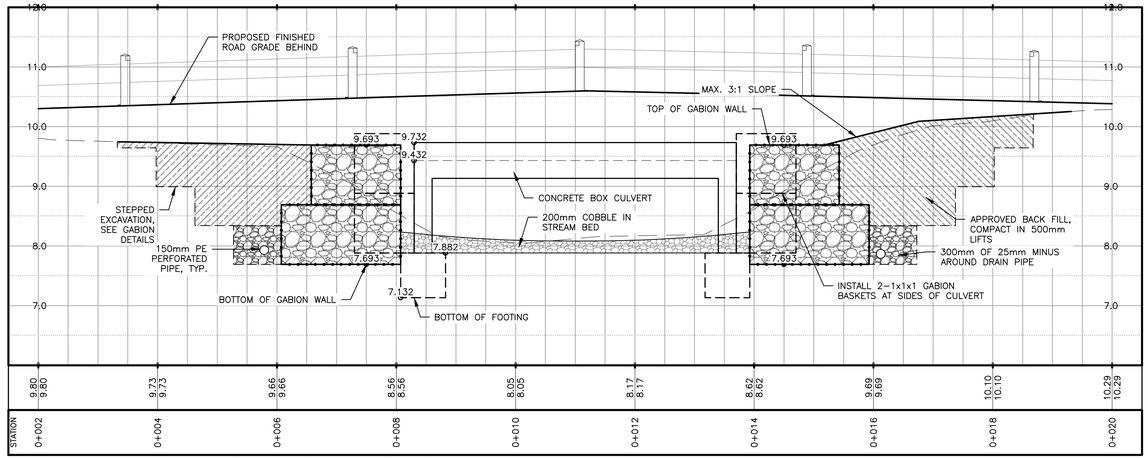
NIPISA STREET
PLAN

SHEET NO. C3

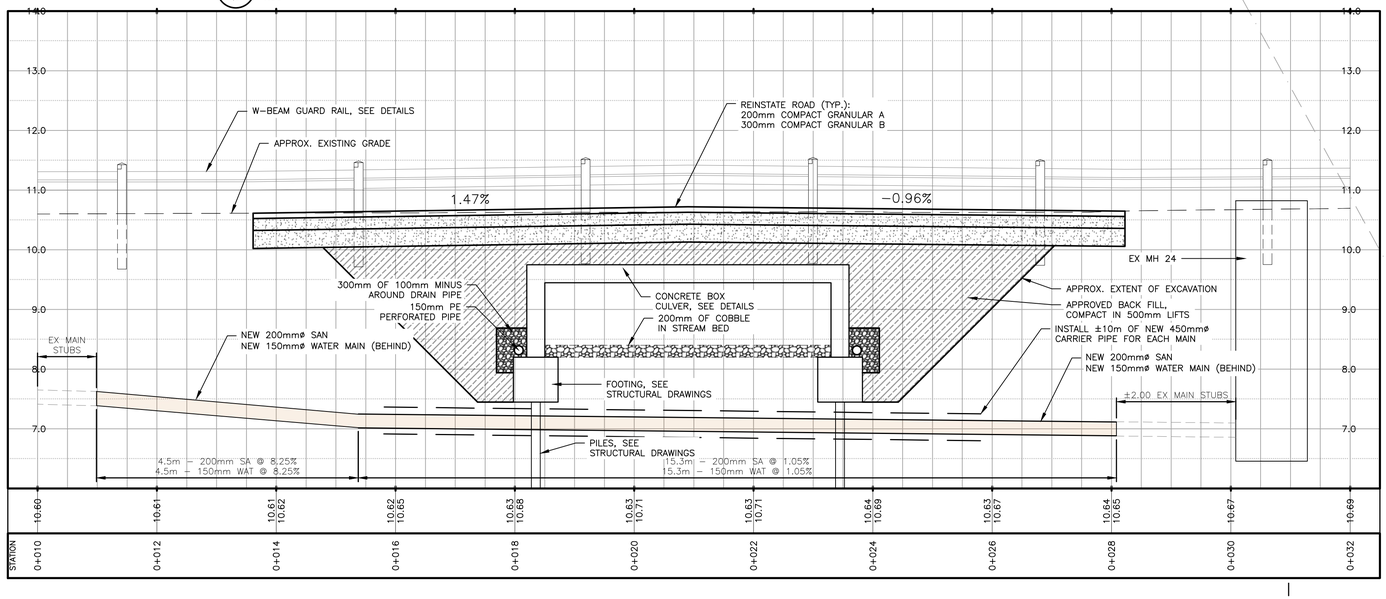
FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2_WORK\DRAWINGS\03 - CONTRACT\248833-02-PLPR-CULV-CON_L_2.DWG PLOTTED BY: WOODFORD, LYDIA
PLOT DATE: 2026-09-02 @ 2:37:53 PM PLOT SCALE: 12.585 PLOT STYLE: CANRAL - MARY RIVER.CTB



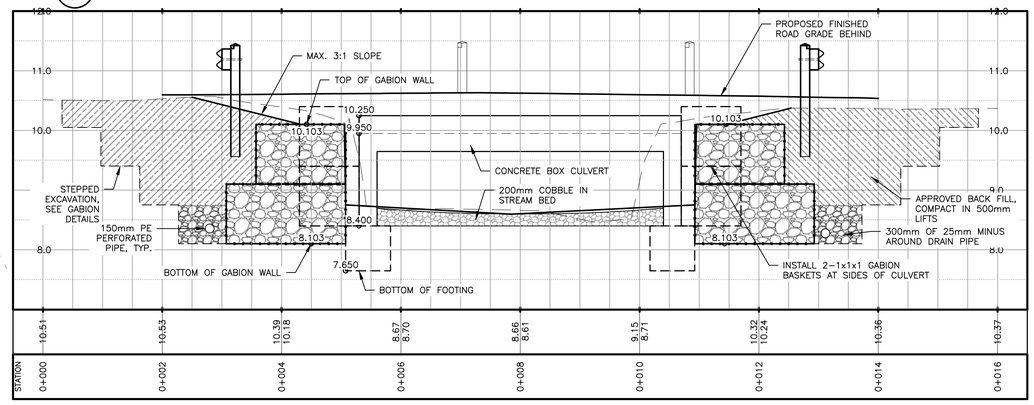
1 C4 N-S STREAM SECTION
1:50



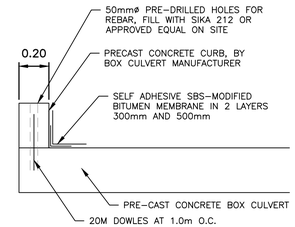
3 C4 DOWN STREAM SECTION
1:50



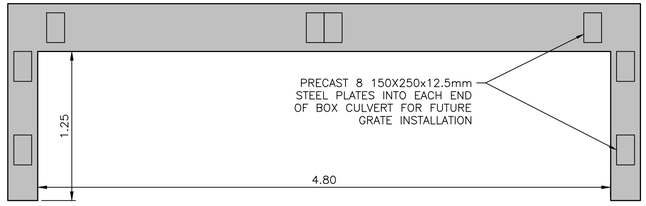
2 C4 ROAD SECTION
1:50



4 C4 UP STREAM SECTION
1:50



5 C4 CONCRETE CURB (TYP.)
N.T.S.



6 - NIPISA STREET BOX CULVERT SECTION (TYP.)
N.T.S.

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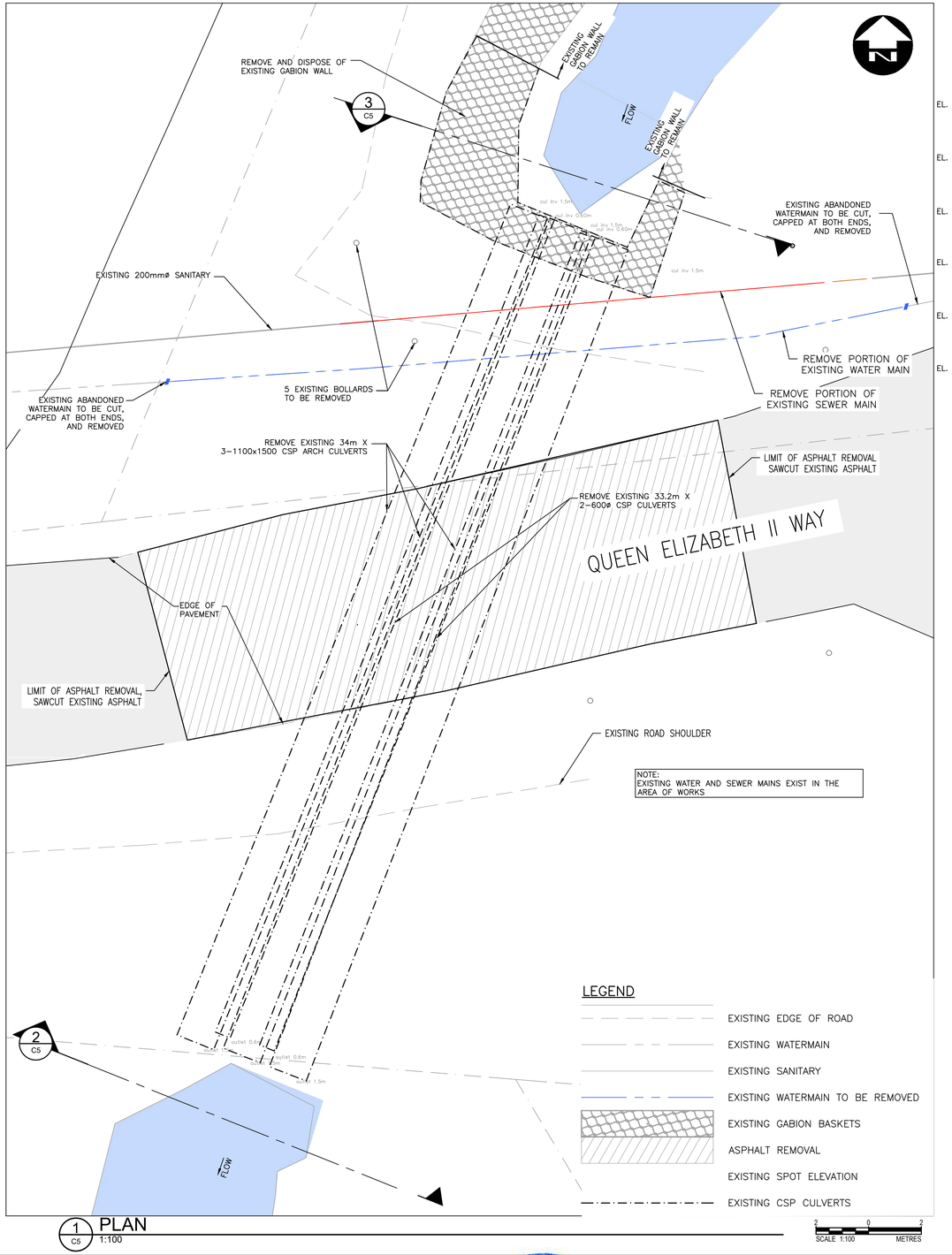
CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

NIPISA STREET PROFILES AND DETIALS

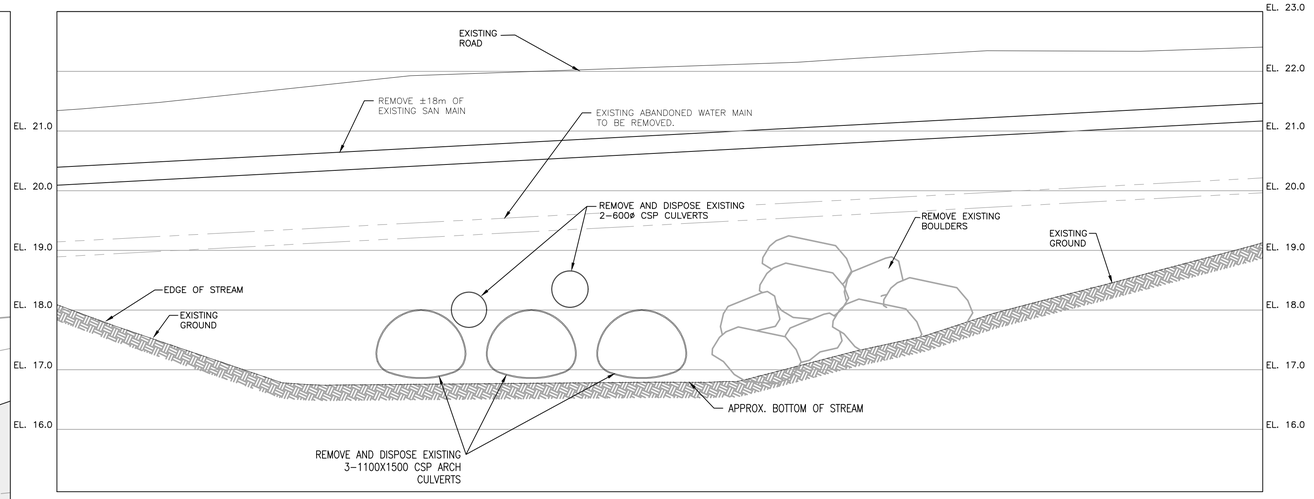
PROJECT NO. 24-8833
SHEET NO. C4

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2_WORK\DRAWINGS\03 - CONTRACT\248833-02-PLPR-CULVERTDETAILS.DWG
PLOT DATE: 2026-09-02 @ 3:24:10 PM PLOT STYLE: CANRAIL - MARY RIVER.CTB
PLOT SCALE: 12.565

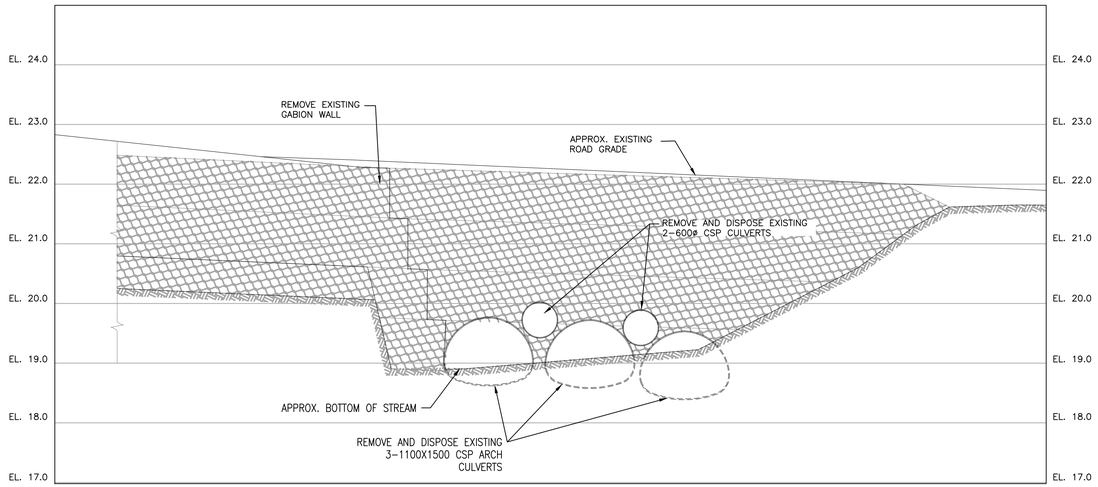
DILLON CONSULTING LIMITED, 1 NICHOLAS BEAVER PLACE, IQALUIT, NUNAVUT, X0A 1H1, PHONE (867) 979-0741
DILLON CONSULTING LIMITED, 150 DUFFERIN AVENUE, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209



1 C5 PLAN 1:100



2 C5 DOWNSTREAM REMOVALS 1:50



3 C5 UPSTREAM REMOVALS 1:50



DOWNSTREAM / LOOKING NORTH–EAST





UPSTREAM / LOOKING SOUTH–WEST

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09-04-2026
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CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

QUEEN ELIZABETH II WAY
EXISTING CONDITIONS AND REMOVALS

SHEET NO. C5

DILLON CONSULTING LIMITED, 235 YORKLAND BLVD, SUITE 800, NORTH YORK, ONTARIO, M2J 4Y8, PHONE (416) 229-4647, FAX (416) 229-4692
DILLON CONSULTING LIMITED, 1 CONCORDE GATE, SUITE 1000, TORONTO, ONTARIO, M3C 3N6, PHONE (416) 229-4647, FAX (416) 229-4692
DILLON CONSULTING LIMITED, 1558 WILLIAM STREET, UNIT 1, LONDON, ONTARIO, N5V 1Z7, PHONE (519) 438-6192, FAX (519) 672-8209

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 – CONTRACT\248833–02–RDH–CON–DETAILS.DWG
PLOT DATE: 2026–09–02 @ 1:58:47 PM PLOT SCALE: 1:25.45 PROJECTSITE:DWG, INSTALLATION OTHER.CTB

SRT-350 TERMINATION ON ALL GUARDRAIL ENDS

FUTURE AV S26-G

EXISTING ABANDONED WATER MAIN

EX 200mm SAN. SEWER TO REMAIN IN SERVICE DURING CONSTRUCTION

WHITE ROW

0+000

NEW 44m LONG GUIDERAIL SEE DETAIL SHEET C10

2 C7

APPROXIMATE EXTENT OF REINSTATEMENT

QUEEN ELIZABETH II WAY

NEW 41m LONG GUIDERAIL SEE DETAIL SHEET C9

0+020

EDGE OF EXISTING GRAVEL ROAD

SRT-350 TERMINATION ON ALL GUARDRAIL ENDS

NEW ROADWAY SHOULDER TO TIE INTO EXISTING

2 C8

0+000

21.21

21.17

21.54

1 C8

INSTALL NEW 3 TIER X 6 WIDE GABION WALL

20.58 | 3:1 | 20.58

21.53

21.88

3:1

FLOW

0+000

0+025

21.75 | 19.01 | 19.31

21.75 | 18.90

1 C7

0+040

FLOW

EDGE OF STREAM

19.01

21.95

22.28

CONCRETE BOX CULVERT SEE DETAIL SHEET C8

3:1

21.37 | 20.69 | 20.69

INSTALL NEW 2 TIER X 7 WIDE GABION WALL ON TOP OF BOX CULVERT

INSTALL NEW 3 TIER X 3 WIDE GABION WALL

0+013.136

22.36

22.30

22.69

3:1

0+000

REPLACE ±18m OF SAN SEWER TO MATCH EXISTING, C/W COUPLER ON EACH END

NEW ROADWAY SHOULDER TO TIE INTO EXISTING

2.02% (TYP.)

APPROXIMATE EXTENT OF REINSTATEMENT

0+032.189

ABANDONED WATER MAIN

ABANDONED WATER MAIN

10.5 N.T.S.

SRT-350 TERMINATION ON ALL GUARDRAIL ENDS

MH84

SRT-350 TERMINATION ON ALL GUARDRAIL ENDS

LEGEND

- ABANDONED WATERMAIN
- EXISTING SANITARY MAIN
- EXPOSED END OF NEW CONCRETE BOX CULVERT
- EXISTING GABION BASKETS
- NEW GABION BASKETS
- EXISTING PROPERTY LINES
- EXISTING CONTOURS
- NEW ASPHALT PAVING
- NEW GUIDERAIL
- NEW COBBLE IN STREAM

1.5 0 1.5
SCALE 1:75 METRES

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SCALE	1:75

CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

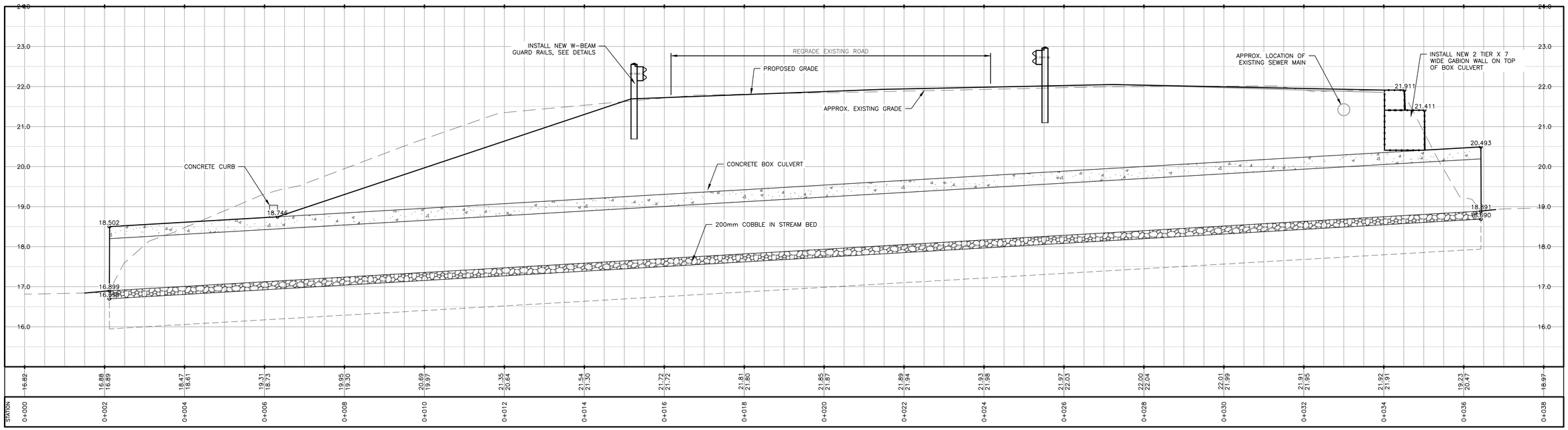
PROJECT NO. 24-8833

QUEEN ELIZABETH II WAY
PLAN

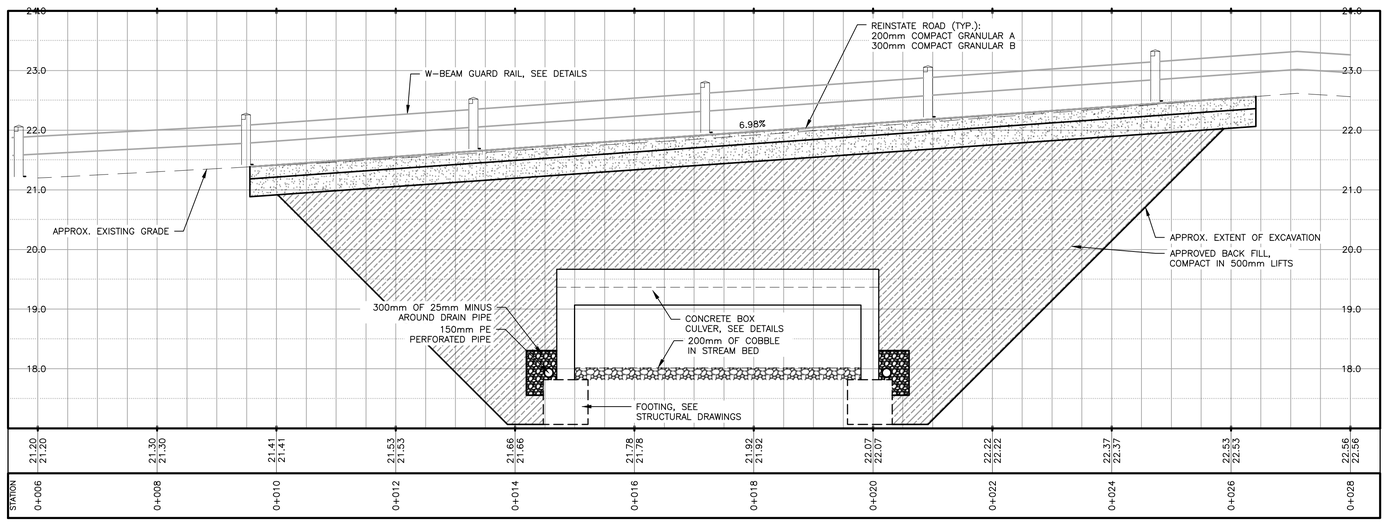
SHEET NO. C6

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FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 - CONTRACT\248833-02-PLPR-CULVERT.DWG
PLOT DATE: 2026-09-03 @ 11:20:56 AM PLOT SCALE: 1:25 PLOTTED BY: MWOOD
XREF: ...\DWG\248833-02-PLPR-CULVERT.DWG



1 C7 N-S STREAM SECTION
1:50



2 C7 ROAD SECTION
1:50

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SCALE AS NOTED

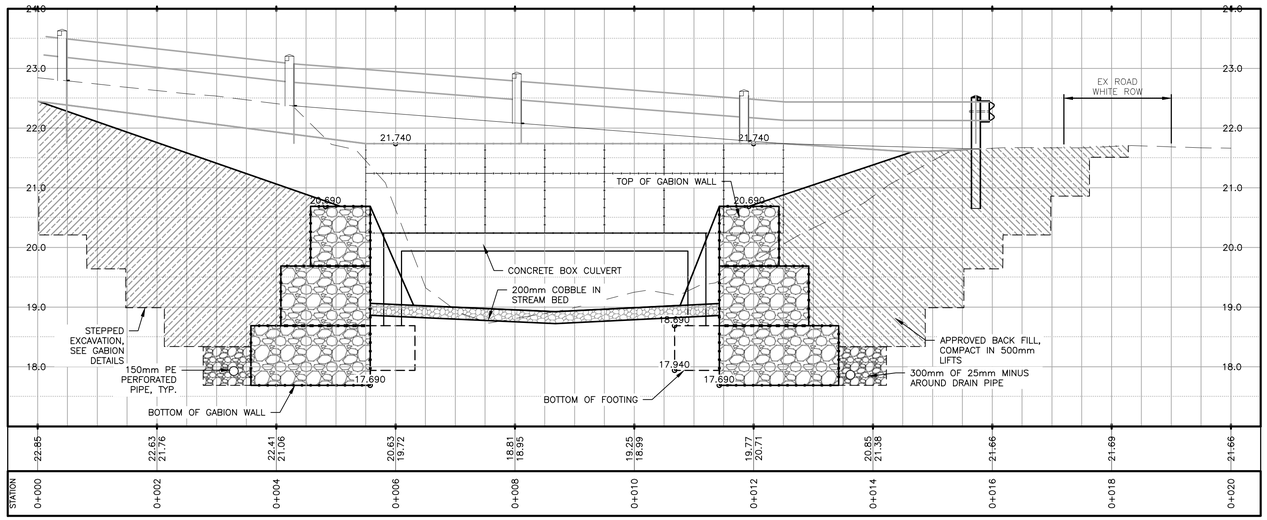
CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

QUEEN ELIZABETH II WAY
PROFILE

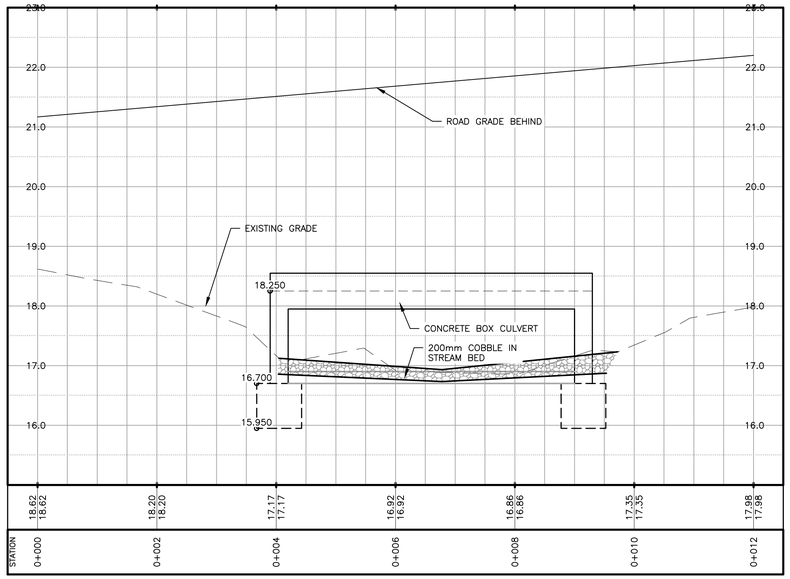
PROJECT NO. 24-8833

SHEET NO. C7

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 - CONTRACT\248833-02-PLPR-CULVERTS.DWG
PLOT DATE: 2026-09-03 @ 11:21:35 AM PLOT SCALE: 1:2.585 PLOT STYLE: CANVAS - MARY RIVER.CTB
DILLON CONSULTING LIMITED, 1 NICHOLAS BEAVER AVENUE, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209

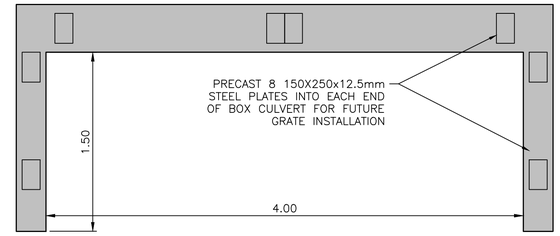


1 / C8 UP STREAM SECTION
1:50

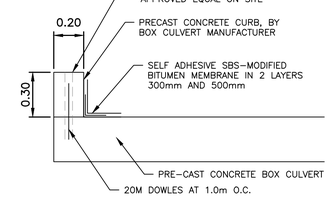


2 / C8 DOWN STREAM SECTION
1:50

PRECAST BOX CULVERT NOTES:
1. CONCRETE
   a. CLASS: C1
   b. MAXIMUM WATER TO CEMENT RATIO = 0.50
   c. MINIMUM SPECIFIED COMPRESSIVE STRENGTH = 35MPa AT 28 DAYS
   d. AIR CONTENT RANGE = 5–8%
2. FOOTING TO BE PRECAST WITHIN SECTIONS OF BOX CULVERT, FOOTING AND BOX CULVERT TO BE DESIGNED BY MANUFACTURER.
3. ALL EXPOSED CORNERS OF BOX CULVERT TO HAVE 25mm CHAMFER UNLESS NOTED OTHERWISE.
4. ALL DOWELED CONNECTIONS BETWEEN BOX CULVERT SECTIONS TO BE FILLED WITH NON–SHRINK GROUT.
5. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR PRECAST CONCRETE BOX CULVERT AND FOOTINGS, CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE TERRITORY OF NUNAVUT.
6. STRUCTURES TO BE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF CAN CSA S6. LIVE LOAD TO BE CL–625 OR ABOVE.
7. UNIT PRICES WITH SUPPLY AND INSTALLATION OF CONCRETE BOX CULVERT SHALL INCLUDE ALL LABOUR, SHIPPING, PLANT AND MATERIALS TO INSTALL NEW CONCRETE BOX CULVERT TO SIZE AS INDICATED. PRICE IS INCLUDING BUT NOT LIMITED TO PROVISION OF ENGINEERED SHOP DRAWINGS, EXCAVATION, BACKFILL, SUPPLY, SHIPPING AND PLACEMENT OF PRECAST CONCRETE BOX CULVERT.



3 / C8 QUEEN ELEZIBETH II WAY BOX CULVERT X-SECTION (TYP.)
1:25



4 / C8 CONCRETE CURB (TYP.)
1:20

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\2_WORK\DRAWINGS\03 – CONTRACT\248833–02–PLPR–CULVERTS.DWG
PLOT DATE: 2026–09–03 @ 11:27:57 AM PLOT SCALE: 1:2.585 PLOT STYLE: CANRAIL – MARY RIVER.CTB
DILLON CONSULTING LIMITED, 10 KINGSBRIDGE GARDEN CIRCLE, SUITE 700, MISSISSAUGA, ONTARIO, M5V 0W2, PHONE (905) 567-4444
DILLON CONSULTING LIMITED, 5155 SPECTRUM WAY, UNIT 6, MISSISSAUGA, ONTARIO, L4W 5A1, PHONE (905) 567-4444
DILLON CONSULTING LIMITED, 1 NICHOLAS BEAVER ROAD, SUITE 101, IQALUIT, NUNAVUT, X0A 0H0, PHONE (867) 979-0093
DILLON CONSULTING LIMITED, 1558 WILLIAM STREET, UNIT 1, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209

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Date September 4, 2026
PERMIT NUMBER: P 010
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REGISTERED PROFESSIONAL ENGINEER
S.J. GREELEY
LICENSEE
09-04-2026
NT/NU

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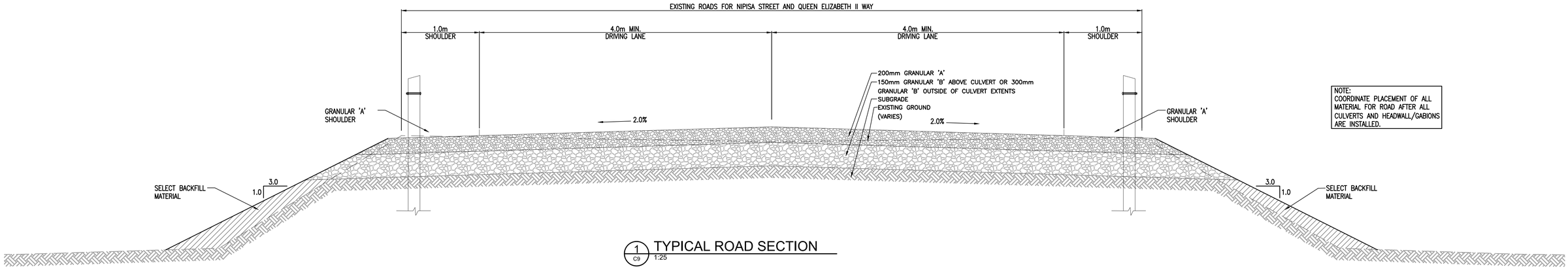
DESIGN SJG	REVIEWED BY SJG
DRAWN MWC	CHECKED BY LW
DATE SEPTEMBER 2026	
SCALE AS NOTED	

CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

QUEEN ELIZABETH II WAY
CULVER DETAILS

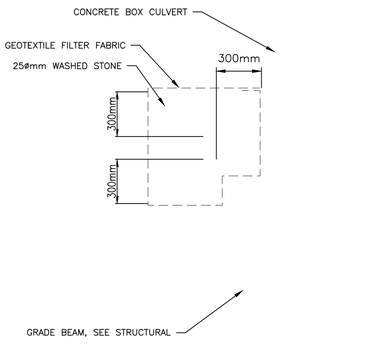
PROJECT NO. 24-8833

SHEET NO. C8

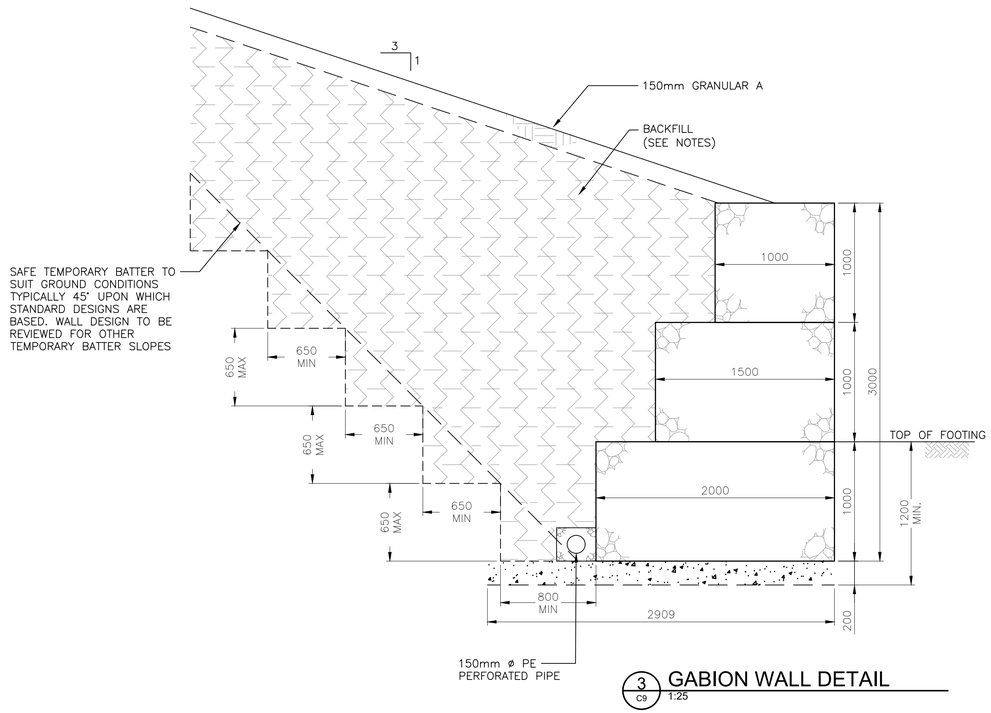


NOTE:
COORDINATE PLACEMENT OF ALL MATERIAL FOR ROAD AFTER ALL CULVERTS AND HEADWALL/GABIONS ARE INSTALLED.

1 C9 TYPICAL ROAD SECTION
1:25



2 C9 WEEPING TILE
1:20



3 C9 GABION WALL DETAIL
1:25

NOTE:

1. THE SIDE OF THE EXCAVATIONS AND ANY TEMPORARY EARTHWORKS PROFILES ARE TO BE REGULARLY INSPECTED TO ENSURE THAT THEY REMAIN STABLE AND ARE NOT DETERIORATING THROUGH THE INGRESS OF WATER OR GROUND WATER SEEPAGE OR ANY OTHER MEANS AND THE WORKS CAN BE CONSTRUCTED SAFELY AT ALL TIMES.
2. GABIONS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. ALL GABION PANEL INTERSECTIONS ARE TO BE LACED WITH WIRE MATCHING THE GABION MESH.
4. INTERNAL BRACING WIRES ARE TO BE PROVIDED TO EXPOSED FACES. WIRE TO MATCH GABION MESH. WIRE TO BE PROVIDED AT 1/3 AND 2/3 GABION HEIGHT FOR 1.0m HIGH GABIONS AND 1/2 HEIGHT FOR 0.5m HIGH GABIONS.
5. GABION INFILL STONE SHALL BE HARD AND DURABLE AND 150mm NOMINAL SIZE BUT NOT LESS THAN 100mm AND NOT GREATER THAN 200mm.
6. GABION INFILL STONE SHALL BE ANGULAR AND PLACED FLAT TO MINIMIZE VOIDS AND PROVIDE A DENSE STABLE MASS. GABION STONE SHALL BE HAND PICKED AFTER PLACING BY MACHINE. STONES TO THE FRONT SHALL BE SELECTED AND HAND PLACED TO PROVIDE A NEAT FINISH.
7. GABION SIZES ARE NOMINAL AND ARE 2.0m NOMINAL LENGTH. ACTUAL SIZES ARE TO THE NEAREST 3 INCHES. FOR FURTHER DETAILS CONTACT FINE MESH METALS LTD.
8. GABIONS TO BE WELDED MESH 76.2x76.2x3,4 OR 5mmØ WIRE. GALFAN CORROSION PROTECTION COATING AS FINE MESH METALS LTD.
   –3.0 ø WIRE FOR WALLS UP TO AND INCLUDING 3.0m HIGH.
   –4.0 ø WIRE TO FACE PANELS TO TOP THREE ROWS AND THROUGHOUT THE SUBSEQUENT ROWS FOR WALLS GREATER THAN 3.0m HIGH.
9. FORMATION TO BE PROOF ROLLED WITH A DEAD WEIGHT ROLLER TO IDENTIFY ANY SOFT SPOTS WHICH ARE TO BE EXCAVATED AND FILLED WITH TYPE 1 GRANULAR SUB BASE MATERIAL COMPACTED IN LAYERS N/E 150mm THICKNESS

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SCALE	AS SHOWN

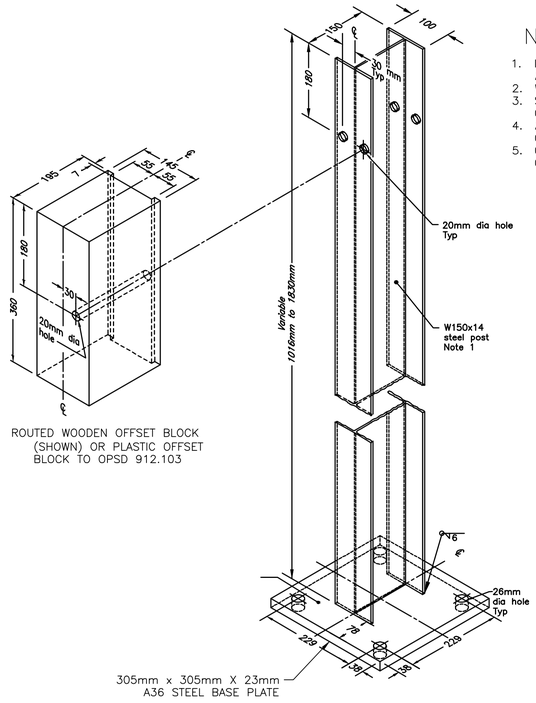
CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

SECTIONS AND DETAILS

SHEET NO. C9

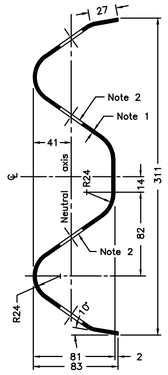
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PLOT DATE: 2026-09-03 @ 11:31:46 AM PLOT SCALE: 1:25.8 PROJECTSTYLE: DILLON-STANDARD.CTB FRAME.CTB



NOTES

1. IMPERIAL SIZE STEEL SECTIONS W6x9 OR W6x8.5 ARE ACCEPTABLE.
2. WELDS SHALL BE ACCORDING TO CSA W59
3. STEEL POST AND BASE PLATE SHALL BE HOT DIP GALVANIZED AFTER MANUFACTURING
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
5. GUIDERAILS TO BE INSTALLED AS PER CSA S6 CANADIAN HIGHWAY BRIDGE DESIGN CODE.

1 GUARDRAIL POST INSTALLATION ON BOX CULVERT
C'0 N.T.S

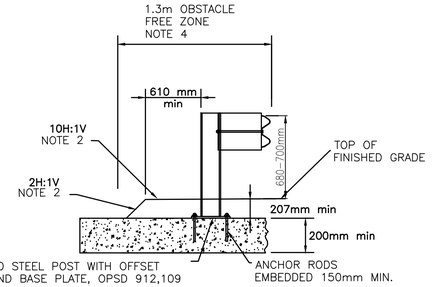


NOTES

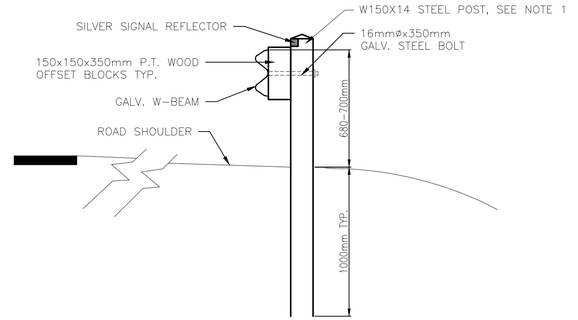
1. BASE METAL THICKNESS OF RAIL SHALL BE 2.67mm NOMINAL AND 2.44mm MINIMUM.
2. HOLES ONLY IN RAIL
3. ALL DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES UNLESS OTHERWISE INDICATED
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

SPLICE BOLT LENGTH	
LOCATION	LENGTH
At posts	32
At structure anchor	38

2 W-BEAM
C10 N.T.S



3 GUIDERAIL POST DETAIL CONNECTION TO CONCRETE BOX CULVERT
C10 N.T.S



4 GUIDERAILTYP INSTALLATION
C10 1:20

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CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

GUIDERAIL POST DETAILS

PROJECT NO. 24-8833
SHEET NO. C10

FILENAME: P:\2024\24833 NIPISA AND QEW CULVERT REPLACEMENTS\2. WORK\DRAWINGS\03 - CONTRACT\24833-02-DETJDWG PLOTTED BY: WOODFORD, LYDIA
PLOT DATE: 2026-09-03 @ 11:32:07 AM PLOT SCALE: 1:25#5-P500 ISSUE FOR TENDER.DWG STANDARD.CTB