Project Name:	Nipisa Street and QEW Culvert Replacements
Addendum Number:	2
Project ID:	2026 RFT-015

Addendum 2 is hereby issued to amend the *2026-RFT-015 Nipisa and QEW Culvert Replacements*. The changes outlined in this addendum shall take precedence over the original document.

Question 1.1

For Nipisa street 2 gabions of 1m x 1m x 1m are shown on drawing C4 on the side of culvert but are not included in cost submission form? Please confirm this requirement and add it to the cost submission form if required.

Answer 1.1

See attached updated Bid Form.

Four (4) 1m x 1m x 1m gabion baskets are required on Nipisa Street.

Question 1.2

There are no details for piles and concrete footing. There is a note to refer to structural drawings, but no structural drawings are included in the RFT documents. Please provide the structural drawings showing the concrete footing details and confirm dimensions and number for piles.

Answer 1.2

See attached Structural drawings, for pile and footing details.

Question 1.3

Allowance for third party testing in cost submission form is $16,000 each for both Nipisa and Queen Elizabeth way. Section 01 21 00 from specs indicates an allowance of $27,000. There is a discrepancy please confirm which amount is the correct one.

Answer 1.3

The allowance for third party testing is $16,000.

See attached revised specification section 01 21 00

Question 1.4

There is a discrepancy for gabions between specification for gabions on drawing C9 and the one from specification 31 36 00. Please confirm which specifications are the correct one.

Answer 1.4

See attached revised specification section 31 36 00.

Question 1.5

Specification for Vehicle W-beam guide rail is included in section 34 71 13.25 that is indicated to be applicable for culverts. Please correct this.

Answer 1.5

See attached revised specification section 34 71 13.25.

Question 1.6

For Nipisa: Cost submission form is indicating 14 gabions of 2m x 1m x 1m and 14 gabions of 1,5m x 1m x 1m but drawing C3 shows 15 gabions of each dimension. Please confirm which quantities are correct.

For Queen Elizabeth way: Cost submission form is indicating 7 gabions de 1m x 1m x 0,5m but drawing shows 0,5m wide x 0,5m high gabions. Please confirm which is correct?

Answer 1.6

See attached updated Bid Form.

Question 1.7

Please confirm in which item of the cost submission form the installation of 3 meters of new 1200mm CSP culvert should be included?

Answer 1.7

See attached updated Bid Form.

Question 1.8

Specifications for water and sanitary main lines in the RFT documents ask for Series 160 HDPE pipe. The city of Iqaluit draft municipal guidelines asks for DR9 (Series 250) for both water and sewer mains. Please confirm which specifications are to be considered as municipal guidelines are normally to be respected.

Answer 1.8

See attached revised Specification Section 33 14 16.13.

All watermains and sewermains to be DR9 (series 250) piping. Proponents shall comply with the City of Iqaluit's Municipal Design Guidelines.

Question 1.9

Please confirm that DR11 HDPE pipe is acceptable for the 450mm carrier pipe?

Answer 1.9

All carrier pipes for water and sewer mains to be HDPE DR11.

Revise note on sheet C3 to read:

> "NEW CARRIER PIPE FOR WATER AND SEWER. 10m LONG EACH 600mm DIAMETER HDPE CARRIER PIPE FOR 200mm DIAMETER WATER MAIN 550mm HDPE CARRIER PIPE FOR 200mm DIAMETER SANITARY MAIN"

See attached revised Specification Sections 33 14 16.13 and 33 31 11.

Question 1.10

Appendix E - product suppliers: There is a line for Geogrid and culvert markers but there is no requirement for these products on the drawing on in the RFT document. Please remove this or confirm where they are required?

Answer 1.10

Appendix E delete the word "Geogrid" in row 4 of table, replace with "Geotextile"

Culvert marker to be reinstalled at culvert extension on Nipisa Street.

Question 1.11

Detail 1 drawing C10 for guide rail posts is indicating a variable height between 1016mm and 1830 mm but detail 3 shows a height between 887mm and 907mm. Please confirm which is correct?

Answer 1.11

Top of W-Beam to be 680-700mm above finished grade. See details 3&4 Sheet C10.

Question 1.12

Item 12.c of the cost submission form for Nipisa Street indicates a total length of guide rail of 42 meters, however the notes on drawings C3 indicate 26 meters and 30 meters for a total of 56 meters. Please confirm which length is correct? Item 12.c of the cost submission form for queen Elizabeth way is indicating a total length of guide rail of 67 meters however the notes on drawing

are indicating 44 meters and 41 meters for a total of 85 meters. Please confirm which length is correct?

Answer 1.12

Cost items as per Bid form to allow for site adjustments.

Question 1.13

Please confirm location of the approved site for transport and disposal of excavated material and asphalt.

Answer 1.13

Upon award of contract an approved disposal location will be selected with in the municipal boundary of Iqaluit.

Question 1.14

Final completion date should be clearly indicated in the contract general timelines point 27.4 of part I – procurement and contract requirement. Also, the warranty start date should be 1 day after the substantial performance date.

Answer 1.14

See Addendum #1

Question 1.15

Normal working hours are indicated to be from Monday to Saturday, 7:00 am to 7:00pm. Please confirm that work on Sunday will be permitted.

Answer 1.15

Working on Sunday is permitted.

Question 1.16

Please confirm if any royalties will apply to granular material produced from an approved quarry for this contract. If applicable, please provide applicable rates and calculation basis.

Answer 1.16

Yes, royalties will apply to granular material produced from an approved quarry for this contract. The applicable royalty rates and calculation basis shall be in accordance with the Contractor's quarry permit.

Question 1.17

There is a specifications section for Asphalt paving (32 12 16) however no asphalt paving is included in the cost submission form. Please confirm if there is a requirement for asphalt paving for this project.

Answer 1.17

Remove specification Section 32 12 16 from Tender Document

Question 1.18

Please confirm if there is any requirement for installation of trench insulation for new water and sanitary lines to be installed?

Answer 1.18

Trench insulation as per the City of Iqaluit Guidelines is required for the new water and sanitary sewer along Queen Elizabeth.

Question 1.19

Drawing C8 indicates that footing is to be precast within sections of box culvert and footing and box culvert are to be designed by manufacturers. However, drawings seem to show the footing independent from the box culvert. Footing should be designed by the consultant to ensure compatibility with structural steel piles design. Please confirm who will be responsible for the design of the footing

Answer 1.19

See attached Structural drawings, stamped shop drawings to be submitted of box culvert and footing prior to fabrication.

Question 1.20

Can 25 minus cleaned stone or RipRap be approved to replace 100mm minus material around the drainpipe. 100mm minus is not a typical material used on other projects in Iqaluit.

If substitution is not approved, please provide specifications for the 100 minus as it is not included in table at point 2.1.10 from spec section 31 05 16.

Answer 1.20

Use of 25 mm clear stone in replacement of 100mm minus material is acceptable around the drainpipe.

Question 1.21

Please clarify what excavation is included in the item for common excavation:

-Excavation for box culvert

-Excavation for gabions

-Excavation for piping removal/ installation

-Excavation to divert stream channel to work dry

Excavation is included in cost submission form for item 9 (culvert), item 10 (gabion). If excavation costs for these items are covered under item 6 (Common excavation) please remove the term excavation in the parenthesis for item 9 and 10.

Answer 1.21

Excavation removed from items 9 and 10. All excavation to be included in item 6.

See attached updated Bid Form.

Question 1.22

Would it be possible to add an item in the cost submission form for the new 18 meters HDPE sewer line for Queen Elizabeth Way. There is currently no item for the new line to be installed.

Answer 1.22

See attached updated Bid Form.

Question 1.23

Cost submission form for Nipisa is indicating the water main to be 200mm (Item 13.d).

Drawing C2 and C3 indicates that the water main is 150mm.

Please confirm which is correct and modify drawings/cost submission form accordingly

Answer 1.23

See attached updated Bid Form.

Watermain to be 200mm.

Question 1.24

City of Iqaluit – Infrastructure and lotting document shows an AV25 for sanitary line close to MH24. After validation on site, it appears that there is no AV with sanitary line at this location. Can you confirm MH26 has sanitary line passing through that will allow pumping of the sanitary for the bypass? Can you confirm MH26 has sanitary line passing through that will allow pumping of the sanitary for the bypass?

Answer 1.24

City's existing infrastructure mapping and critical pipeline drawings both indicate an active sewer main flowing through both AV 25 and MH 26.

Question 1.25

Can you confirm if a new AV with sanitary line is planned to be installed in 2027 as part of the projects for new building 158 or 162? If so, please provide location and installation timeline.

Answer 1.25

For the purpose of the bid consider that new AV will not be installed within 2027.

Question 1.26

Can you confirm that item 13.a, 13.b for both Nipisa and Queen Elizabeth way includes temporary services for the buildings affected by the water and sewer line change and the by-pass?

Answer 1.26

Yes, Temporary services to be provided to all affected buildings during construction.

Watermain on Queen Elizabeth is abandoned. Line item removed from Bid Form. The temporary bypass needs to be submitted for review and approved by the city.

Question 1.27

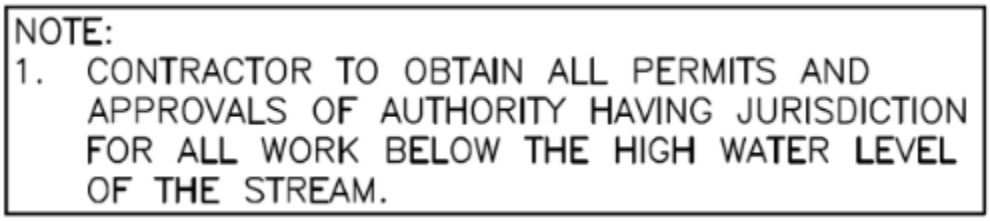
Considering the inquiries that was submitted for which we didn't have answers and the fact the time line of the submission of tender pricing has not affect on the project would it be possible to have an extension of 1 week (7 days) with the closing date on November 4th?

Answer 1.27

See Addendum #1

Question 1.28

There is a note on drawing C2:


NOTE:
1. CONTRACTOR TO OBTAIN ALL PERMITS AND APPROVALS OF AUTHORITY HAVING JURISDICTION FOR ALL WORK BELOW THE HIGH WATER LEVEL OF THE STREAM.

Please confirm that:

2.1 the city has no Nunavut Water Board license or other approvals for this work and that the contractor is responsible for this?

2.2 Please confirm that the Nunavut Waterboard license attached in the RFT document does not cover the work to be done in the stream bed for this project?

Answer 1.28

2.1 & 2.2 The existing authorization covers the work to be done in the stream bed. The city's water license expires on December 13, 2026, and is undergoing renewal. The contractor is not required to apply for additional approval but the work on the stream bed shall not commence until the renewed license is in effect.

END OF ADDENDUM No. 2

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 $16,000 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 WOR 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 PA MENT

.1 abions 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 Only gabions placed within specified lines and grades will be measured for payment.

.3 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.

PART 2 PRODUCTS

2.1 MATERIALS

.1 abion baskets:

.1 abricated 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 as specified on drawings.

.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 eotextile:

.1 Nonwoven geotextile. Standard of acceptance: Maccaferri Mactex M 225 or approved equal.

2.2 PRODUCTION

.1 abions 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.
abions 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 abions and gabion mats shall be supplied in the sizes and to dimensions indicated in the contract documents.

2.3 CERTIFICATION

.1 abions 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. 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. SHIPPING AND MAR ING

.1 abions 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 undles 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 abion 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.

. 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.

. abions shall be assembled so as to leave no wire ends projecting outside the basket on any exposed surface.

3.3 FILLING AS ETS

.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. our or five gabions in a row may be stretched simultaneously.

.3 In order to prevent local deformation, when 0. 1m 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 ill basket cells in lifts of 300mm and connect opposite walls with 2 tie wires after each lift.

3. 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. 1m gabions, 2 horizontal connecting wires, one in each direction, shall be placed. In the case of 0. 1m 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. PLACING GA IONS

.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 or 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. 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 RELATED RE UIREMENTS

.1 Section 01 20 00 Measurement and Payment.

.2 Section 01 2 83 Testing and Laboratory Services.

.3 Section 01 33 00 Shop Drawings and Submittals.

.4 Section 01 35 30 ealth and Safety Requirements.

.5 Section 01 35 43 Environmental Procedures.

.6 Section 01 45 00 Quality Control.

. Section 01 51 00 Temporary Utilities.

.8 Section 01 61 00 Common Product Requirements.

. Section 01 4 1 Construction Demolition Waste Management and Disposal.

.10 Section 01 4 23 Closeout Submittals.

.11 Section 01 8 23 Operation and Maintenance Manual.

.12 Section 01 8 3 Project Record Drawings.

.13 Section 31 05 16 Aggregates for Earthworks.

.14 Section 31 23 33.01 Excavating, Trenching and ackfilling.

.15 Section 32 11 23 Aggregate ase Courses.

.16 Section 33 14 16 Site Water Utility Distribution Piping.

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM D6 8-12 2021 , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400ft-lbf ft 600kN-m m

1.3 WOR 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 Sewer mains shall be DPE DR PE 4 10 Resin, Series 250, 1 24 kPa, IPS dimensional standard with 5 mm urethane insulation encased in a 1.2 mm polyethylene black jacket.

.2 Sewer main carrier pipe to be DPE DR11 PE 4 10 Resin, Series 200, 13 kPa, IPS dimensional standard

.3 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.

.4 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 W Sclairpipe, Urecon UIP, or approved equal.

.5 No joints shall be allowed in piping covered with shop applied insulation.

.6 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	0.018
Operating temperature range	
Cyrogenic to	3
Closed cell content	
ASTM D-2856	0 min
Water absorption gm 1000 cc	
ASTM D-2842	12
Dimensional Stability, ASTM	

D-2126 Procedure 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 uried Sewer Line .

.4 ield oint Sleeves

.1 Wrap sleeves for field fusion joints and for flanged connections to vaults shall be 2. 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 eat Shrink Tape:

.1 eat shrink tape shall be 150 mm wide with the standard of acceptance being Raychem Thermoclad.

.6 alf Shells

.1 alf 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.

. ield Applied Urethane

.1 ield applied urethane shall be Portaform manufactured by Insta- oam Products Inc., or equivalent.

.8 Pipe edding

.1 Pipe bedding shall be sand conforming to the specifications for modified ranular C , as listed in Section 31 05 16: Aggregates for Earthworks.

. alves, Couplings, ittings

.1 alves, 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 I-40, 2440mm wide 50mm thick ranular ackfill

.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. e 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. SER ICE 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. 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. 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. 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. WATER IN EXCA ATION

.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. TRENCHING 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.

3.1 PIPE EDDING

.1 Insulated piping shall be bedded in modified ranular 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 5 Standard Proctor Dry Density as per ASTM D6 8-0 el.

.3 edding 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 ield spraying of urethane will be carried out by experienced operators only using Insta-oam roth-Pak kits or approved equal. Exposed urethane shall be coated with 1 mm of lint ote-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 LA ING

.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 .

3.1 PIPE OINTS

.1 The insulation shall be cut back 1 0 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. ield 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.

3.1 PRESSURE TESTING OF POL ETH LENE 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.

. 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.

3.1 TEST FOR O STRUCTIONS

.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 1 mm or less than the inside diameter of the pipe, can be readily pulled through the line.

3.1 T INSPECTION OF SEWER MAINS

.1 It is brought to the attention of the Contractor that the Owner reserves the right to have a complete T inspection done, on completion of the project, of the installed sewer mains. The cost of such T inspection shall be borne by the Owner. Deficiencies noted by means of the T inspection shall be rectified by the Contractor at his own expense.

3.1 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 lushing operations shall be performed under the direction of the Engineer. Provide 48 hours notice prior to start of flushing operations.

3.1 OINT TESTING

.1 The Owner reserves the right to visually inspect and test fusion joints using non-destructive methods and visual inspection.

3.2 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 I-40 trench insulation boards should be laid side by side on 300mm compacted sand fill.

END OF SECTION

P r 1 G r

1.1 RELATED RE UIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 4 16 Cleaning and Site Maintenance

.3

1.2 MEASUREMENT AND PA MENT

.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 ighway and Transportation Officials AAS TO

.1 AAS TO M180- 2000 2004 , Standard Specification for Corrugated Sheet Steel eams for ighway uardrails.

.2 ASTM International

.1 ASTM A123 A123M- 0 , Standard Specification for inc ot-Dip alvanized Coatings on Iron and Steel Products.

.2 ASTM A30 - 0 b , Standard Specification for Carbon Steel olts and Studs, 60 000 PSI Tensile Strength.

.3 CSA roup CSA

.1 CAN CSA O80 Series- 08 , Wood Preservation.

.4 United States Environmental Protection Agency EPA Office of Water

.1 EPA 832 R- 2-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and est Management Practices.

1. ACTION AND INFORMATIONAL SU MITTALS

.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. DELI ER 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 andling 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.

P r 2 Pr d

2.1 MATERIALS

.1 Steel W-beam guide rail as indicated and as follows:

.1 Steel rail and terminal sections: to AAS TO M180, class A Type 1 zinc coated.

.2 olts, nuts and washers: to ASTM A30 , hot dip galvanized to ASTM A123 A123M.

.3 Standard Type W-beam consisting of 2. 5 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 Signal Reflectors

.1 Silver signal reflectors and yellow signal reflectors shall be of size 5 mm x 100 mm.

.2 Nails for securing signal reflectors shall consist of 30 mm galvanized flat head nails.

.3 olts, Nuts, Washers and Spikes

.1 All bolts, nuts and washers shall conform to the specifications of ASTM A30 or 3125M, 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 olts 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.

. olts, nuts, washers and other fittings shall be hot-dip galvanized in accordance with ASTM A153 Standard Specification for inc Coating ot Dip on Iron and Steel ardware.

P r 3 E

3.1 EXAMINATION

.1 erification 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 isually 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- 2-005 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 ackfill 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.

. 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. CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 4 16 Cleaning and Site Maintenance

.1 Leave Work area clean at end of each day.

.2 inal Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 4 16 Cleaning and Site Maintenance.

3. 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

APPENDIX B – COST SUBMISSION FORM

Date: _____

Project Name: **City of Iqaluit – Nipisa Street and QEW Culvert Replacements**

I/We, _____

Of _____

ddr

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 are 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, and Concrete Testing)	L.S.	1	$16,000	$
6.	Common Excavation	m^3	560	$	$
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 including 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. 25mm Washed Stone 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	$	$
	g. 1200mm CSP Culvert and marker	m	3	$	$
10.	Gabion Baskets including 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.	15	$	$
	ii. Install	ea.	15	$	$
	b. 1.5m x 1m x 1m				
	i. 1.5m x 1m x 1m – Supply and Deliver	ea.	15	$	$

	ii. 1.5m x 1m x 1m – Install	ea.	15	$	$
	c. 1m x 1m x 1m				
	i. Supply and Deliver	ea.	4	$	$
	ii. Install	ea.	4	$	$
	d. Non woven Geotextile	m^2	63	$	$
	e. Remove				
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 10m length 500mm HDPE carrier pipe DR 11	m	10	$	$
	d. Supply and install 10m length 600mm HDPE carrier pipe DR 11	m	10	$	$
	e. Supply and Install 200mm HDPE Water Main	m	16	$	$
	f. Supply and Install 200mm HDPE Sanitary Sewer	m	16	$	$
	g. 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 Piles	m	30	$	$

15.	Supply and installation of Steel Piles	LS	1	$	$
				Subtotal Nipisa Culvert.	$
Queen Elezabeth II Way					
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 and Asphalt Testing)	L.S.	1	$16000	$
6.	Common Excavation and disposal off-site at the city-specified location.	m^3	1300	$	$
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 each.	m	36	$	$
	d. Existing Gabion Baskets	m	36	$	$
	e. Existing Bollard	Ea.	1	$	$
9.	Culverts including 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 including 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.	17	$	$
	ii. Install	ea.	17	$	$
	d. 05m x 0.5m x 1m				
	i. Supply and Deliver	ea.	8	$	$
	ii. Install	ea.	8	$	$
	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 Sanitary Sewer In Service During Construction	L.S	1	$	$
	b. 150mm HDPE End Cap	Ea.	2	$	$
	c. Supply and install new 200mm DR9 Sanitary Sewer c/w mechanical restraint couplers	m	18	$	$
14.	Supply and Install Concrete Grade Beam c/w 50mm Void Form and Connections to Concrete Box Culvert and Adfreeze Steel Piles	m	68	$	$
15.	Steel Piles	LS	1	$	$
				Sub-Total <u>Queen Elezabeth II Way</u>:	$
				Total both locations	**$**
				GST:	**$**
				TOTALTENDER AMOUNT:	**$**

END OF SECTION

GENERAL NOTES:
1. DO NOT SCALE THESE DRAWINGS. CHECK ALL DIMENSIONS BY SITE MEASUREMENT PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS WITH THE STRUCTURAL DETAILS SHOWN. REPORT ANY INCONSISTENCIES PROMPTLY TO THE ENGINEER.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ANY EXISTING SERVICE PIPES OR CONDUITS TO REMAIN ACTIVE ON THE NEW SITE.
3. COMPLY WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE AND LOCAL CONSTRUCTION SAFETY ACTS & REGULATIONS.
4. DO NOT EXCEED THE DESIGN LOADS DURING CONSTRUCTION. PROVIDE ADEQUATE BRACING TO ENSURE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. PROVIDE TEMPORARY BRACING AS REQUIRED.
5. ALL WORK TO BE DONE IN ACCORDANCE WITH 2015 NBC-1ST WRITING AND CAN/CSA-S6-14 (CHBDC).

STRUCTURAL STEEL:
1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED TO CAN3.S16.1M. SUPPLY ALL NEW STRUCTURAL STEEL: ROLLED BEAMS AND COLUMNS TO CSA G40.21M GRADE 350W; HOLLOW SECTIONS, CHANNELS, ANGLES AND PLATES TO CSA G40.21M GRADE 300W CLASS 'C'. SUPPLY ALL NEW BOLT FASTENERS: ASTM A325M. ANCHOR BOLTS: ASTM A307M.
2. SHOP AND SITE WELDING SHALL COMPLY WITH CSA W59 AND W48 USING E480XX ELECTRODES. WELDING SHALL BE CARRIED OUT BY WELDERS CERTIFIED UNDER CWB IN ACCORDANCE WITH CSA W47.1.
3. ALL STEEL SHALL BE CLEANED TO SSPC.SP.3 MINIMUM. EXPOSED MEMBERS SHALL RECEIVE 2 COATS OF ZINC RICH PRIMER TO COSR SPEC 1.GP.171M, REMAINDER TO RECEIVE 1 SHOP COAT OF PRIMER TO COSR SPEC 1.GP.40M, UNLESS HOT DIPPED GALVANIZING IS NOTED. EXISTING STEEL TO BE THOROUGHLY CLEANED OF ALL FLAKING, PAINT SURFACE CORROSION AND SCALE.
4. ALL CONNECTIONS SHALL USE ASTM A325M BOLTS AND CONFORM TO CAN3.S16.1M AND THE CISC HANDBOOK OF STEEL CONSTRUCTION.
5. SUBMIT COPIES OF SHOP DRAWINGS SHOWING ERECTION AND CONNECTION DETAILS. PROVIDE ALL TEMPORARY SHORING AND BRACING TO ENSURE THE STRUCTURE REMAINS STABLE DURING CONSTRUCTION.
6. GROUT BELOW ALL COLUMN BEARING PLATES USING DRY PACK NON-SHRINK CONCRETE GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 30 MPa UNO.
7. THE SHEAR CAPACITY OF ALL BEAM AND GIRDER CONNECTIONS SHALL NOT BE LESS THAN THE SHEAR CAPACITY OF THE SECTION ACTING AS A SIMPLE BEAM LOADED UNIFORMLY TO ITS MOMENT CAPACITY OVER THE SAME SPAN NOR LESS THAN THAT SHOWN ON THE DRAWINGS, WHICHEVER IS GREATER.

SUB-FOUNDATIONS:
1. DO NOT BURY THE PILES WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.
2. JOINTS MUST BE MADE WITH FULL PENETRATION "GROOVE WELDS". ALL WELDS TO BE PREFORMED BY A FABRICATOR CERTIFIED WITH THE "CANADIAN WELDING BUREAU" (CWB) AS PER CSA W47.1-09(R2014) AND SHALL CONFORM TO REQUIREMENTS ESTABLISHED IN CSA W59-03(R2008). COMPETENCE CARDS WILL BE REQUIRED.
3. PILE HEADS MUST NOT BE 50mm AWAY FROM THEIR THEORETICAL LOCATION. PILE VERTICAL ALIGNMENT MUST NOT DEVIATE BY MORE THAN 2% WHEN COMPARED TO THEIR FULL LENGTH.
4. PRIOR TO COMMENCING PILE INSTALLATION, SUBMIT TO THE ENGINEER FOR VERIFICATION. ALL CHARACTERISTICS RELATING TO PILE DRIVING EQUIPMENTS, AS WELL AS FORMULAS USED IN PILE DRIVING DESIGN CALCULATIONS.
5. PILES ARE TO BE FILLED WITH SAND OR SLURRY.
6. PILE TO BE VIBRATED IN PLACE TO ENSURE A GOOD SEAT ON BEDROCK.
7. PILE BOND LENGTH TO BE CLEANED OF GREASE, OIL OR LOOSE MATERIAL.
8. DRILLED HOLE TO BE FREE OF DEBRIS, MUD OR WATER PRIOR TO INSTALLATION.
9. PILE DESIGN BASED ON GEOTECHNICAL REPORT BY CANADRILL LIMITED, TITLED 'GEOTECHNICAL INVESTIGATION 2022 DRAINAGE IMPROVEMENTS IQALUIT, NU' ISSUED NOV. 4, 2022 TO CITY OF IQALUIT.
10. WHENEVER POSSIBLE, FULL LENGTH PILES SHALL BE PROVIDED TO ELIMINATE SPLICING DURING INSTALLATION. SHOP SPLICING SHALL BE PERFORMED USING COMPLETE JOINT PREPARATION GROOVE WELDS.
11. STEEL FOR CAP PLATES AND TIP REINFORCEMENT SHALL CONFORM TO CAN/CSA STANDARD G40.21 GRADE 300W
12. APPROVAL SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO PRE-BORING, WATER JETTING OR OTHER SIMILAR TECHNIQUES. THE CONTRACTOR MAY UTILIZE ALL NORMAL METHODS TO INSTALL PILES, INCLUDING REMOVAL OF OBSTRUCTIONS, SPUDDING, JETTING, PRE-DRILLING OR THE USE OF FOLLOWERS.
13. PILES DAMAGED OR BROKEN DUE TO DRIVING OR MISHANDLING WILL NOT BE ACCEPTED
14. PILES ARE TO BE FILLED WITH A SAND SLURRY MIX BOTH INSIDE AND OUTSIDE OF THE PILE.
15. REFER TO TYPICAL PILE DETAIL(S) FOR ADDITIONAL INSTALLATION REQUIREMENTS.
16. CONTRACTOR TO FOLLOW RECOMMENDATIONS FOR PILE INSTALLATIONS PROVIDED IN GEOTECHNICAL REPORT.
17. ADFREEZE PILES NOT TO BE LOADED UNTIL ADEQUATE FREEZE BACK HAS OCCURED AS PER GEOTECHNICAL RECOMMENDATIONS.

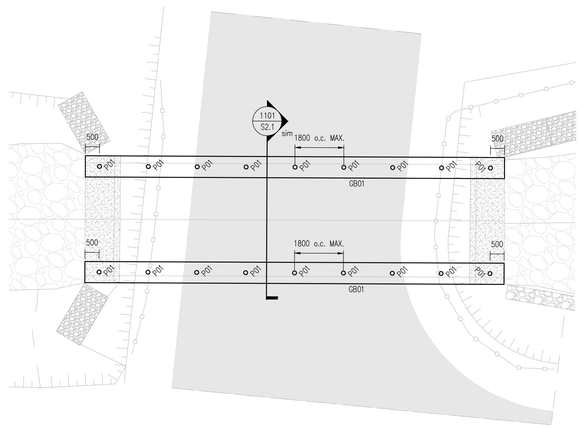
DESIGN CRITERIA
1. DESIGN LOADS AS PER REQUIREMENTS OF CAN/CSA-S6-14 (CANADIAN HIGHWAY BRIDGE DESIGN CODE).

COLD WEATHER GROUT:
1. GROUT USED FOR ADFREEZE STEEL PIPE PILES INSTALLATION TO BE COLD WEATHER GROUT, "SIKAGROUT ARCTIC-100" OR APPROVED EQUIVALENT, HAVING MINIMUM UNCONFINED COMPRESSION STRENGTH OF 30 MPa OR GREATER.
2. GROUT MIX TO BE BETWEEN 20°C TO 25°C WHEN PLACED.
3. GROUT SHOULD BE PLACED WITH AN INTEGRAL MECHANICAL MINER/PUMP WITH SHEARING ACTION.

CAST-IN-PLACE CONCRETE:

1. CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH CSA A23.1 AND CSA A23.3.
2. CONCRETE SHALL BE READY-MIXED AND USE MATERIAL CONFORMING TO:
CEMENT: CSA A3001, NORMAL TYPE GU PORTLAND CEMENT
AGGREGATE: CSA A23.1
REINFORCING STEEL: CSA G30.18 GRADE 400 (400W WHERE WELDING REQUIRED)
3. CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:
28-DAY COMPRESSIVE STRENGTH: 30MPa
SLUMP:75mm +/- 25mm
AIR CONTENT: 5-8%
EXPOSURE CLASS: C-1
COVER: 80mm
4. WELDED WIRE FABRIC SHALL BE PLACED IN ACCORDANCE WITH THE RSIC MANUAL. WELDED WIRE FABRIC SHALL BE CHAIRED TO PROVIDE PROPER COVER.
5. DEVELOPMENT LENGTHS SHALL CONFORM TO THE FOLLOWING:
A. STRAIGHT BAR DEVELOPMENT: 24 1/2"
B. STRAIGHT BAR SPLICE: 32"
C. HOOKED BAR DEVELOPMENT: 9 1/2"
6. PROTECT CONCRETE SLABS FROM PREMATURE MOISTURE LOSS OR MECHANICAL INJURY FOR MINIMUM OF 4 DAYS FOLLOWING PLACEMENT. USE CLEAR LIQUID SEAL TO ASM C309 OR WET CURING.
7. CONTRACTOR SHALL ARRANGE FOR ALL TESTING OF CONCRETE TO CSA A23.1. TEST RESULTS SHALL BE FORWARDED TO THE ENGINEER FOR REVIEW.
8. PLACE A 19mm CHAMFER ON ALL EXPOSED EDGES.
9. WET SETTING OF REINFORCING STEEL, DOWELS, AND ANCHOR BOLTS IS PROHIBITED.

PRECAST UNITS
1. PRECAST BOX CULVERT UNITS SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH CAN/CSA-S6-14 (CHBDC).
2. SUPPORT CONDITIONS FOR DESIGN OF THE PRECAST UNITS SHALL BE BASED UPON THE ASSUMPTION THAT THE FOUNDATIONS PROVIDE VERTICAL SUPPORT ONLY (NO RESTRAINT AGAINST HORIZONTAL MOVEMENT OR ROTATION).
3. THE PRECAST DESIGNER SHALL VERIFY THE REINFORCING INDICATED IS ADEQUATE TO TRANSFER REQUIRED LOADS BETWEEN ADJACENT PRECAST UNITS.
4. SHOP DRAWINGS SHALL BE SUBMITTED AND BEAR THE SIGNATURE AND STAMP OF A QUALIFIED PROFESSIONAL ENGINEER REGISTERED IN NUNAVUT AND THE NORTHWEST TERRITORIES.
5. THE LOAD SUPPORT REACTIONS (PER METRE LENGTH OF FOUNDATION) SHALL BE INDICATED ON THE PRECAST UNIT SHOP DRAWINGS AND WILL BE REVIEWED BY THE ENGINEER TO VERIFY THE FOUNDATION DESIGN.



Nipisa Street Box Culvert Plan

Scale : 1:100

0 1000 2000 4000

DRAWING LIST
S2.1 BOX CULVERT PLANS & TYPICAL BOX CULVERT SECTION GENERAL NOTES, SCHEDULES, AND TYP. AD-FREEZE PILE TYPICAL ROCK SOCKET DETAIL

ROCK SOCKETED GEOTECHNICAL PARAMETERS PILE TABLE

PILE OUTSIDE DIAMETER (mm)	UNFACTORED ULS GROUT-TO-ROCK CAPACITY (kPa)	SLS GROUT-TO-ROCK BOND CAPACITY (kPa)	MINIMUM EMBEDMENT INTO SOUND BEDROCK (m)
114 OR 141	1500	N/A	1.0

NOTE:
1. ULS UNFACTORED BOND CAPACITY IS BASED ON THE USE OF 30MPa GROUT AND SLOTS 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 TO RESIST FROST JACKING FORCE OF 150 kPa THROUGH THE DESIGN ACTIVE LAYER THICKNESS.

AD-FREEZE GEOTECHNICAL PARAMETERS PILE TABLE:

PILE OUTSIDE DIAMETER (mm)	UNFACTORED ULS AD-FREEZE BOND CAPACITY (kPa)	SLS AD-FREEZE BOND CAPACITY (kPa)	MINIMUM EMBEDMENT BELOW FINISHED GRADE (m)
114 OR 141 (UNSLOTTED)	175	45	10.0
114 OR 141 (SLOTTED)	225	60	10.0

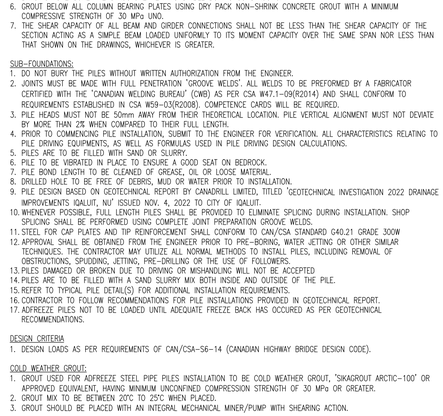
NOTE:
1) ULS GEOTECHNICAL RESISTANCE FACTOR OF 0.4 SHOULD BE APPLIED FOR COMPRESSION LOADS.
2) ULS GEOTECHNICAL RESISTANCE FACTOR OF 0.3 SHOULD BE APPLIED FOR TENSION LOADS.
3) SLS BOND CAPACITY BASED ON 30mm CREEP OVER 30 YEARS
4) MINIMUM EMBEDMENT TO RESIST FROST JACKING FORCE OF 150 kPa THROUGH THE DESIGN ACTIVE LAYER THICKNESS.

PILE SCHEDULE

DESIGNATION	PILE OUTSIDE DIAMETER (mm)	ROCK SOCKETED EMBEDMENT (m)	SLOTTED AD-FREEZE EMBEDMENT (m)	MAX. COMPRESSION PILE LOAD (kN)
P01	141	2.0	15.0	480

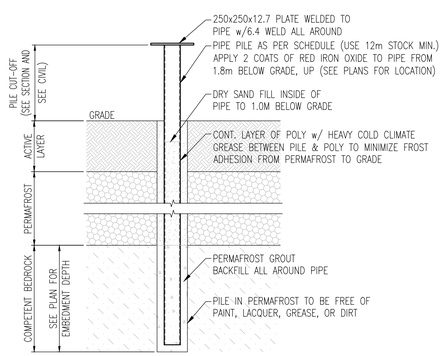
GRADE BEAM SCHEDULE

DESIGNATION	DESCRIPTION
GB01	900mm x 750mm w/ SHEAR KEY (SEE SECTION) 4-20M T&B +2-15M E.F. +10M STIRRUPS @ 250mm o.c.



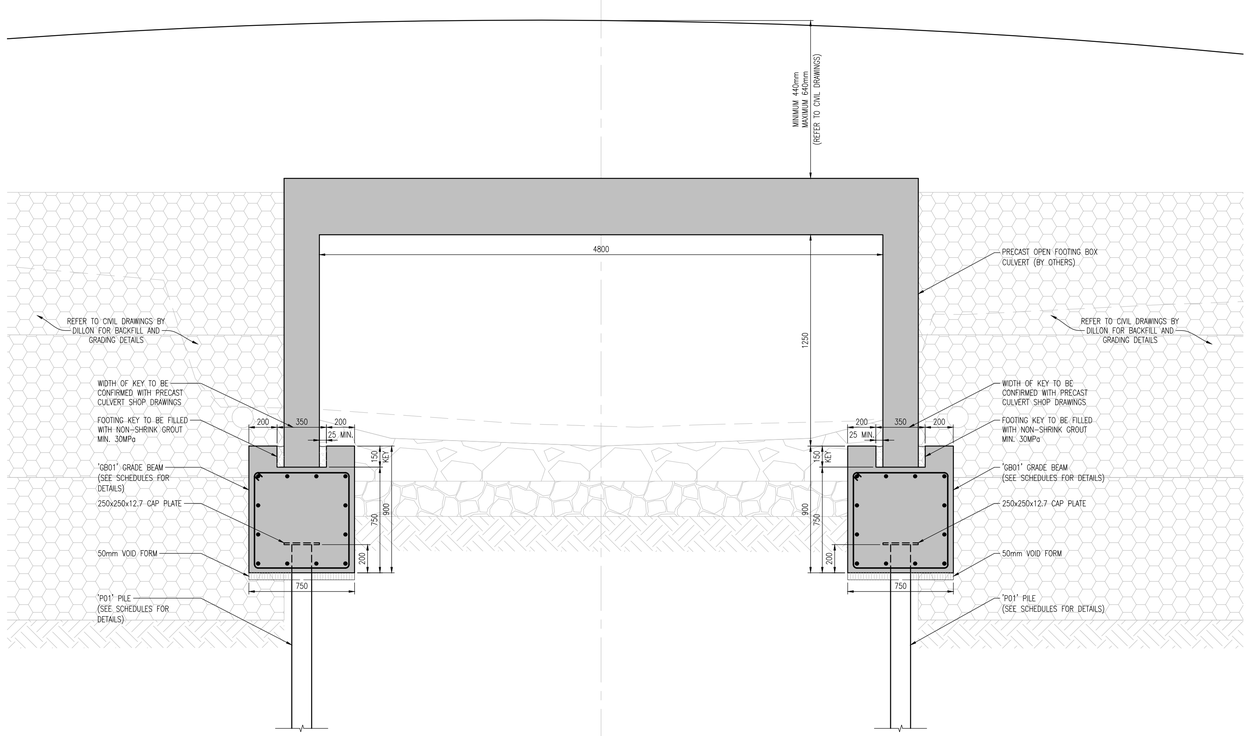
Typ. Ad-Freeze Pile

Scale : 1:20



Typ. Rock Socket Pile

Scale : 1:20



1101 S2.1 Box Culvert Section @ Nipisa Street

Scale : 1:20

0 200 500 1000

REGISTERED PROFESSIONAL ENGINEER
Robert Hawkins
R.B. HAWKINS
LICENSEE
NT/NU
Mar 30, 2026

co-elevate

NO.	REVISIONS	BY	DATE
01	ISSUED FOR CLIENT REVIEW	LM	2026-03-16
02	ISSUED FOR CONSTRUCTION	LM	2026-03-30

DESIGNED BY	RBH
DRAWN BY	LM
PROJECT NO.	3738-2

THE CONTRACTOR MUST CHECK ALL DRAWINGS AND VERIFY ALL DIMENSIONS ON THE PROJECT. DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION WORK OR SHOP FABRICATION. DRAWINGS ARE NOT TO BE SCALED.

PERMIT TO PRACTICE
CO-ELEVATE
Signature
Date March 30, 2026
PERMIT NUMBER: P 1395
NT/NU Association of Professional Engineers and Geoscientists

NIPISA STREET BOX CULVERT DESIGN
NIPISA / OBEEK CROSS-OVER
IQALUIT, NU
BOX CULVERT PLANS & TYPICAL BOX CULVERT SECTION + NOTES

S2.1

GENERAL NOTES:
1. DO NOT SCALE THESE DRAWINGS. CHECK ALL DIMENSIONS BY SITE MEASUREMENT PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS WITH THE STRUCTURAL DETAILS SHOWN. REPORT ANY INCONSISTENCIES PROMPTLY TO THE ENGINEER.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ANY EXISTING SERVICE PIPES OR CONDUITS TO REMAIN ACTIVE ON THE NEW SITE.
3. COMPLY WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE AND LOCAL CONSTRUCTION SAFETY ACTS & REGULATIONS.
4. DO NOT EXCEED THE DESIGN LOADS DURING CONSTRUCTION. PROVIDE ADEQUATE BRACING TO ENSURE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. PROVIDE TEMPORARY BRACING AS REQUIRED.
5. ALL WORK TO BE DONE IN ACCORDANCE WITH 2015 NBC-1ST WRITING AND CAN/CSA-S6-14 (CHBDC).

STRUCTURAL STEEL:
1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED TO CAN3.S16.1M. SUPPLY ALL NEW STRUCTURAL STEEL: ROLLED BEAMS AND COLUMNS TO CSA G40.21M GRADE 350W; HOLLOW SECTIONS, CHANNELS, ANGLES AND PLATES TO CSA G40.21M GRADE 300W CLASS 'C'. SUPPLY ALL NEW BOLT FASTENERS: ASTM A325M. ANCHOR BOLTS: ASTM A307M.
2. SHOP AND SITE WELDING SHALL COMPLY WITH CSA W59 AND W48 USING E480XX ELECTRODES. WELDING SHALL BE CARRIED OUT BY WELDERS CERTIFIED UNDER CWB IN ACCORDANCE WITH CSA W47.1.
3. ALL STEEL SHALL BE CLEANED TO SSPC-SP3 MINIMUM. EXPOSED MEMBERS SHALL RECEIVE 2 COATS OF ZINC RICH PRIMER TO CGSB SPEC 1.GP.171M, REMAINDER TO RECEIVE 1 SHOP COAT OF PRIMER TO CGSB SPEC 1.GP.40M, UNLESS HOT DIPPED GALVANIZING IS NOTED. EXISTING STEEL TO BE THOROUGHLY CLEANED OF ALL FLAKING, PAINT SURFACE CORROSION AND SCALE.
4. ALL CONNECTIONS SHALL USE ASTM A325M BOLTS AND CONFORM TO CAN3.S16.1M AND THE CISC HANDBOOK OF STEEL CONSTRUCTION.
5. SUBMIT COPIES OF SHOP DRAWINGS SHOWING ERECTION AND CONNECTION DETAILS. PROVIDE ALL TEMPORARY SHORING AND BRACING TO ENSURE THE STRUCTURE REMAINS STABLE DURING CONSTRUCTION.
6. GROUT BELOW ALL COLUMN BEARING PLATES USING DRY PACK NON-SHRINK CONCRETE GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 30 MPa UNO.
7. THE SHEAR CAPACITY OF ALL BEAM AND GIRDER CONNECTIONS SHALL NOT BE LESS THAN THE SHEAR CAPACITY OF THE SECTION ACTING AS A SIMPLE BEAM LOADED UNIFORMLY TO ITS MOMENT CAPACITY OVER THE SAME SPAN NOR LESS THAN THAT SHOWN ON THE DRAWINGS, WHICHEVER IS GREATER.

SUB-FOUNDATIONS:
1. DO NOT BURY THE PILES WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.
2. JOINTS MUST BE MADE WITH FULL PENETRATION "GROOVE WELDS". ALL WELDS TO BE PREFORMED BY A FABRICATOR CERTIFIED WITH THE "CANADIAN WELDING BUREAU" (CWB) AS PER CSA W47.1-09(R2014) AND SHALL CONFORM TO REQUIREMENTS ESTABLISHED IN CSA W59-03(R2008). COMPETENCE CARDS WILL BE REQUIRED.
3. PILE HEADS MUST NOT EE 50mm AWAY FROM THEIR THEORETICAL LOCATION. PILE VERTICAL ALIGNMENT MUST NOT DEVIATE BY MORE THAN 2% WHEN COMPARED TO THEIR FULL LENGTH.
4. PRIOR TO COMMENCING PILE INSTALLATION, SUBMIT TO THE ENGINEER FOR VERIFICATION. ALL CHARACTERISTICS RELATING TO PILE DRIVING EQUIPMENTS, AS WELL AS FORMULAS USED IN PILE DRIVING DESIGN CALCULATIONS.
5. PILES ARE TO BE FILLED WITH SAND OR SLURRY.
6. PILE TO BE VIBRATED IN PLACE TO ENSURE A GOOD SEAT ON BEDROCK.
7. PILE BOND LENGTH TO BE CLEANED OF GREASE, OIL OR LOOSE MATERIAL.
8. DRILLED HOLE TO BE FREE OF DEBRIS, MUD OR WATER PRIOR TO INSTALLATION.
9. PILE DESIGN BASED ON GEOTECHNICAL REPORT BY CANADRILL LIMITED, TITLED "GEOTECHNICAL INVESTIGATION 2022 DRAINAGE IMPROVEMENTS IQALUIT, NU" ISSUED NOV. 4, 2022 TO CITY OF IQALUIT.
10. WHENEVER POSSIBLE, FULL LENGTH PILES SHALL BE PROVIDED TO ELIMINATE SPLICING DURING INSTALLATION. SHOP SPLICING SHALL BE PERFORMED USING COMPLETE JOINT PREPARATION GROOVE WELDS.
11. STEEL FOR CAP PLATES AND TIP REINFORCEMENT SHALL CONFORM TO CAN/CSA STANDARD G40.21 GRADE 300W
12. APPROVAL SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO PRE-BORING, WATER JETTING OR OTHER SIMILAR TECHNIQUES. THE CONTRACTOR MAY UTILIZE ALL NORMAL METHODS TO INSTALL PILES, INCLUDING REMOVAL OF OBSTRUCTIONS, SPUDDING, JETTING, PRE-DRILLING OR THE USE OF FOLLOWERS.
13. PILES DAMAGED OR BROKEN DUE TO DRIVING OR MISHANDLING WILL NOT BE ACCEPTED
14. PILES ARE TO BE FILLED WITH A SAND SLURRY MIX BOTH INSIDE AND OUTSIDE OF THE PILE.
15. REFER TO TYPICAL PILE DETAIL(S) FOR ADDITIONAL INSTALLATION REQUIREMENTS.
16. CONTRACTOR TO FOLLOW RECOMMENDATIONS FOR PILE INSTALLATIONS PROVIDED IN GEOTECHNICAL REPORT.
17. ADFREEZE PILES NOT TO BE LOADED UNTIL ADEQUATE FREEZE BACK HAS OCCURED AS PER GEOTECHNICAL RECOMMENDATIONS.

DESIGN CRITERIA
1. DESIGN LOADS AS PER REQUIREMENTS OF CAN/CSA-S6-14 (CANADIAN HIGHWAY BRIDGE DESIGN CODE).

COLD WEATHER GROUT:
1. GROUT USED FOR ADFREEZE STEEL PIPE PILES INSTALLATION TO BE COLD WEATHER GROUT, "SIKAGROUT ARCTIC-100" OR APPROVED EQUIVALENT, HAVING MINIMUM UNCONFINED COMPRESSION STRENGTH OF 30 MPa OR GREATER.
2. GROUT MIX TO BE BETWEEN 20°C TO 25°C WHEN PLACED.
3. GROUT SHOULD BE PLACED WITH AN INTEGRAL MECHANICAL MINER/PUMP WITH SHEARING ACTION.

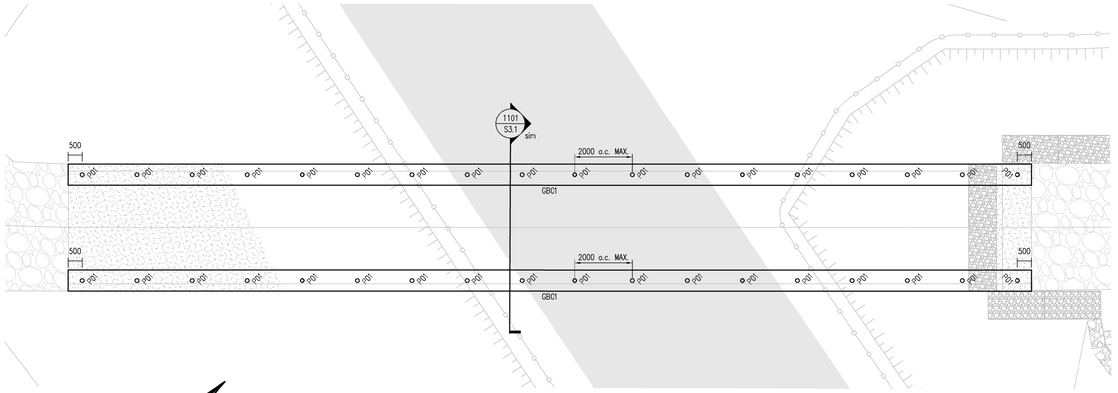
CAST-IN-PLACE CONCRETE:

1. CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH CSA A23.1 AND CSA A23.3.
2. CONCRETE SHALL BE READY-MIXED AND USE MATERIAL CONFORMING TO:
CEMENT: CSA A3001, NORMAL TYPE GU PORTLAND CEMENT
AGGREGATE: CSA A23.1
REINFORCING STEEL: CSA G30.18 GRADE 400 (400W WHERE WELDING REQUIRED)
3. CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:
28-DAY COMPRESSIVE STRENGTH: 30MPa
SLUMP:75mm +/- 25mm
AIR CONTENT: 5-8%
EXPOSURE CLASS: C-1
COVER: 80mm
4. WELDED WIRE FABRIC SHALL BE PLACED IN ACCORDANCE WITH THE RSIC MANUAL. WELDED WIRE FABRIC SHALL BE CHAIRED TO PROVIDE PROPER COVER.
5. DEVELOPMENT LENGTHS SHALL CONFORM TO THE FOLLOWING:
A. STRAIGHT BAR DEVELOPMENT: 24 1/2"
B. STRAIGHT BAR SPLICE: 32"
C. HOOKED BAR DEVELOPMENT: 9 1/2"
6. PROTECT CONCRETE SLABS FROM PREMATURE MOISTURE LOSS OR MECHANICAL INJURY FOR MINIMUM OF 4 DAYS FOLLOWING PLACEMENT. USE CLEAR LIQUID SEAL TO ASM C309 OR WET CURING.
7. CONTRACTOR SHALL ARRANGE FOR ALL TESTING OF CONCRETE TO CSA A23.1. TEST RESULTS SHALL BE FORWARDED TO THE ENGINEER FOR REVIEW.
8. PLACE A 19mm CHAMFER ON ALL EXPOSED EDGES.
9. WET SETTING OF REINFORCING STEEL, DOWELS, AND ANCHOR BOLTS IS PROHIBITED.

PRECAST UNITS
1. PRECAST BOX CULVERT UNITS SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH CAN/CSA-S6-14 (CHBDC).
2. SUPPORT CONDITIONS FOR DESIGN OF THE PRECAST UNITS SHALL BE BASED UPON THE ASSUMPTION THAT THE FOUNDATIONS PROVIDE VERTICAL SUPPORT ONLY (NO RESTRAINT AGAINST HORIZONTAL MOVEMENT OR ROTATION).
3. THE PRECAST DESIGNER SHALL VERIFY THE REINFORCING INDICATED IS ADEQUATE TO TRANSFER REQUIRED LOADS BETWEEN ADJACENT PRECAST UNITS.
4. SHOP DRAWINGS SHALL BE SUBMITTED AND BEAR THE SIGNATURE AND STAMP OF A QUALIFIED PROFESSIONAL ENGINEER REGISTERED IN NUNAVUT AND THE NORTHWEST TERRITORIES.
5. THE LOAD SUPPORT REACTIONS (PER METRE LENGTH OF FOUNDATION) SHALL BE INDICATED ON THE PRECAST UNIT SHOP DRAWINGS AND WILL BE REVIEWED BY THE ENGINEER TO VERIFY THE FOUNDATION DESIGN.

DRAWING LIST

S2.1 BOX CULVERT PLANS & TYPICAL
BOX CULVERT SECTION
GENERAL NOTES, SCHEDULES, AND
TYP. AD-FREEZE PILE
TYPICAL ROCK SOCKET DETAIL



Queen Elizabeth Way Box Culvert Plan
Scale : 1:100
0 1000 2000 4000

ROCK SOCKETED GEOTECHNICAL PARAMETERS PILE TABLE			
PILE OUTSIDE DIAMETER (mm)	UNFACTORED ULS GROUT-TO-ROCK CAPACITY (kPa)	SLS GROUT-TO-ROCK BOND CAPACITY (kPa)	MINIMUM EMBEDMENT INTO SOUND BEDROCK (m)
114 OR 141	1500	N/A	1.0

NOTE:
1. ULS UNFACTORED BOND CAPACITY IS BASED ON THE USE OF 30MPa GROUT AND SLOTS 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 TO RESIST FROST JACKING FORCE OF 150 kPa THROUGH THE DESIGN ACTIVE LAYER THICKNESS.

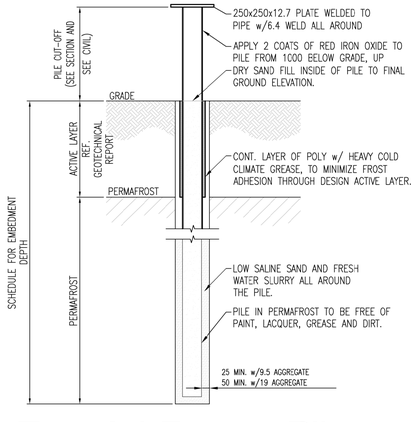
AD-FREEZE GEOTECHNICAL PARAMETERS PILE TABLE:

PILE OUTSIDE DIAMETER (mm)	UNFACTORED ULS AD-FREEZE BOND CAPACITY (kPa)	SLS AD-FREEZE BOND CAPACITY (kPa)	MINIMUM EMBEDMENT BELOW FINISHED GRADE (m)
114 OR 141 (UNSLOTTED)	175	45	10.0
114 OR 141 (SLOTTED)	225	60	10.0

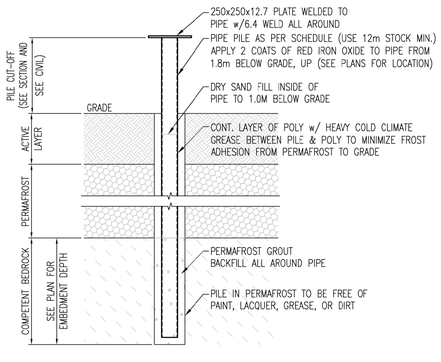
NOTE:
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2) ULS GEOTECHNICAL RESISTANCE FACTOR OF 0.3 SHOULD BE APPLIED FOR TENSION LOADS.
3) SLS BOND CAPACITY BASED ON 30mm CREEP OVER 30 YEARS
4) MINIMUM EMBEDMENT TO RESIST FROST JACKING FORCE OF 150 kPa THROUGH THE DESIGN ACTIVE LAYER THICKNESS.

PILE SCHEDULE				
DESIGNATION	PILE OUTSIDE DIAMETER (mm)	ROCK SOCKETED EMBEDMENT (m)	SLOTTED AD-FREEZE EMBEDMENT (m)	MAX. COMPRESSION PILE LOAD (kN)
P01	141	2.0	15.0	480

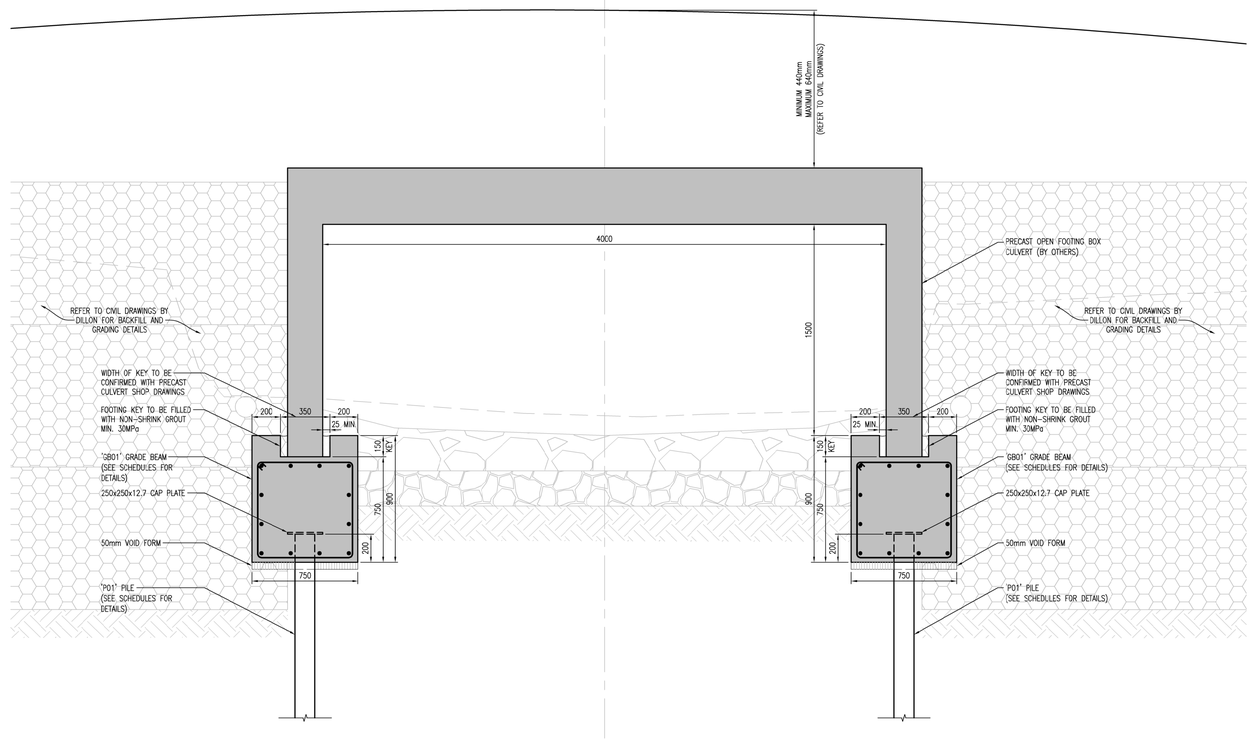
GRADE BEAM SCHEDULE	
DESIGNATION	DESCRIPTION
G901	900mm x 750mm w/ SHEAR KEY (SEE SECTION) 4-20M T&B @ 2-15M E.F. @ 10M STIRRUPS @ 250mm o.c.



Typ. Ad-Freeze Pile
Scale : 1:20



Typ. Rock Socket Pile
Scale : 1:20



1101 S3.1 Box Culvert Section @ Nipisa Street
Scale : 1:20
0 200 500 1000

REGISTERED PROFESSIONAL ENGINEER
R.B. HAWKINS
LICENSEE
NT/NU
Mar 31, 2026

co-elevate

NO.	REVISIONS	BY	DATE
01	ISSUED FOR CLIENT REVIEW	LM	2026-03-16
02	ISSUED FOR CONSTRUCTION	LM	2026-03-31

PROJECT NO.	DRAWN BY	DESIGNED BY
3738.2	LM	RBH

THE CONTRACTOR MUST CHECK ALL DRAWINGS AND VERIFY ALL DIMENSIONS ON THE PROJECT. DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER PRIOR TO PROCEEDING WITH ANY CONSTRUCTION WORK OR SHOP FABRICATION. DRAWINGS ARE NOT TO BE SCALED.

PERMIT TO PRACTICE
CO-ELEVATE
Signature
Date March 31, 2026
PERMIT NUMBER: P 1395
NT/NU Association of Professional Engineers and Geoscientists

QUEEN ELIZABETH STREET
BOX CULVERT DESIGN
NIPISA / CREEK CROSS-OVER
IQALUIT, NU

BOX CULVERT PLANS & TYPICAL
BOX CULVERT SECTION + NOTES

S3.1

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.
4) THE CONTRACTOR SHALL VERIFY THE COMPATIBILITY OF THE CARRIER PIPE, AND WATERMAIN SPACERS, INCLUDING PIPE DIAMETERS, TO ENSURE PROPER FIT AND INSTALLATION PRIOR TO PROCUREMENT. WATERMAIN SPACERS SHALL HAVE A MINIMUM SPACER LENGTH OF 200 MM AND A MINIMUM RUNNER WIDTH OF 25 MM. ACCEPTABLE MANUFACTURERS INCLUDE PSI, BWM, CCI, ADVANCE, SILVERTIP, CASCADE, OR APPROVED EQUIVALENT. THE CONTRACTOR SHALL CONFIRM THE SPACER CONFIGURATION, AND SPACING REQUIREMENTS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ⚠2

ALL GUIDERAIL END TREATMENTS TO BE VALTIR SRT-350 OR APPROVED EQUAL
EXISTING WATER AND SEWER MAINS
EXISTING UTILITY POLE
0+000
13.5m N.T.S.
3 C4
APPROXIMATE EXTENT OF REINSTATEMENT
2 C4
NEW 16m ø200mm HDPE SAN SEWER C/W VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS
NEW ROADWAY SHOULDER TO TIE INTO EXISTING (TYP.)
EXISTING PROPERTY LINES
NEW 16m ø200mm HDPE WATER MAIN C/W ECCENTRIC REDUCER, VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS
NEW 26m LONG GUIDERAIL SEE DETAIL SHEET C10
0+016
4 C4
REGRADE EXISTING DRIVEWAY, ENSURE SMOOTH TRANSITION USING 150mm OF GRANULAR 'A'
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
2.0% (TYP.)
TOP OF BASKETS
0.00%
34.12%
RE-SHAPE EXISTING STREAM BED, LEVEL, REMOVE HIGH SPOTS AND BOULDERS LARGER THAN 1.0mø. INSTALL 250mm OF 150-250mmø COBBLE
TOP OF CURB
0+010
0+000
FLOW
0+019.391
EDGE OF STREAM
EXISTING GABION WALL TO REMAIN UNDISTURBED DURING CONSTRUCTION
NEW CARRIER PIPE FOR WATER AND SEWER. 10m LONG EACH ø600mm HDPE CARRER PIPE FOR ø200mm WATER MAIN ø550mm HDPE CARRER PIPE FOR ø200mm SAN MAIN. SEE NOTE 4. ⚠2
INSTALL ±15m CONCRETE BOX CULVERT
13.5m
INSTALL NEW 2 TIER X 3 WIDE GABION WALL
NEW 16m ø200mm HDPE SAN SEWER C/W VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS ⚠2
APPROX. EXTENT OF REGRADING, MAX SLOPE 3:1
NEW 16m ø200mm HDPE WATER MAIN C/W ECCENTRIC REDUCER, VICTAULTIC RESTRAINT COUPLING AND S.S INSERT AT TIE-INS ⚠2
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.)
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
EXISTING 2m STUB OF ø150mm WATER MAIN TO REMAIN
EXISTING 2m STUB OF ø200mm SANITARY MAIN TO REMAIN
EXISTING MH 24 TO REMAIN
0+026
NIPISA STREET
APPROXIMATE EXTENT OF REINSTATEMENT
0+004
EXISTING 1200ø CULVERT TO REMAIN
KUUGALAAQ STREET
SCALE 1:50 METRES

Conditions of Use

Verify elevations and/cr dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-usa it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

PERMIT TO PRACTICE
DILLON CONSULTING LIMITED
Signature
Date AUGUST 18, 2026
PERMIT NUMBER: P 010
NT/NU Association of Professional Engineers and Geoscientists

2026-11-09
REGISTERED PROFESSIONAL ENGINEER
TIM GRABLEY
LICENSEE
L 5088
NT/NU

ISSUED FOR TENDER

Iqaluit

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	ISSUE FOR ADDUNDUM #2	11-09-2026	SJG
1	ISSUE FOR TENDER	09-04-2026	SJG

DESIGN SJG | REVIEWED BY SJG
DRAWN MWC | CHECKED BY LW
DATE SEPTEMBER 2026
SCALE 1:50

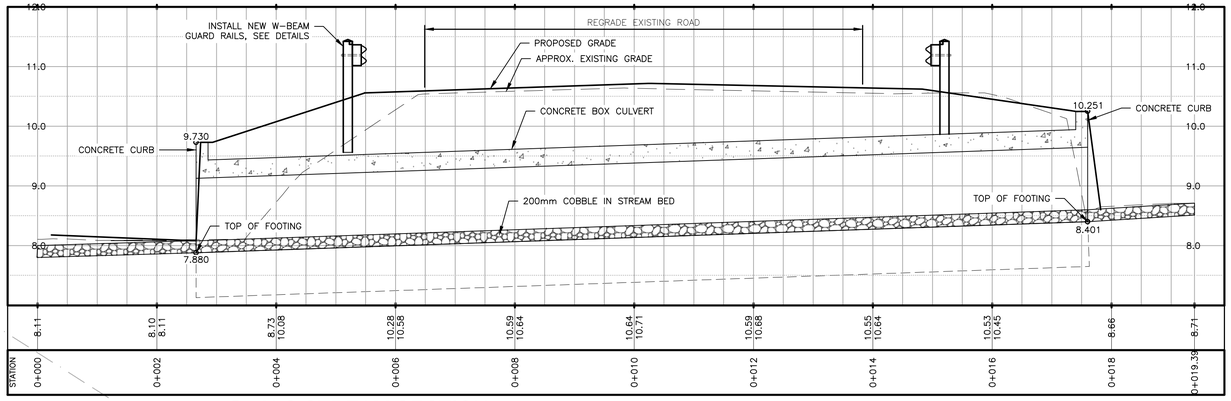
CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

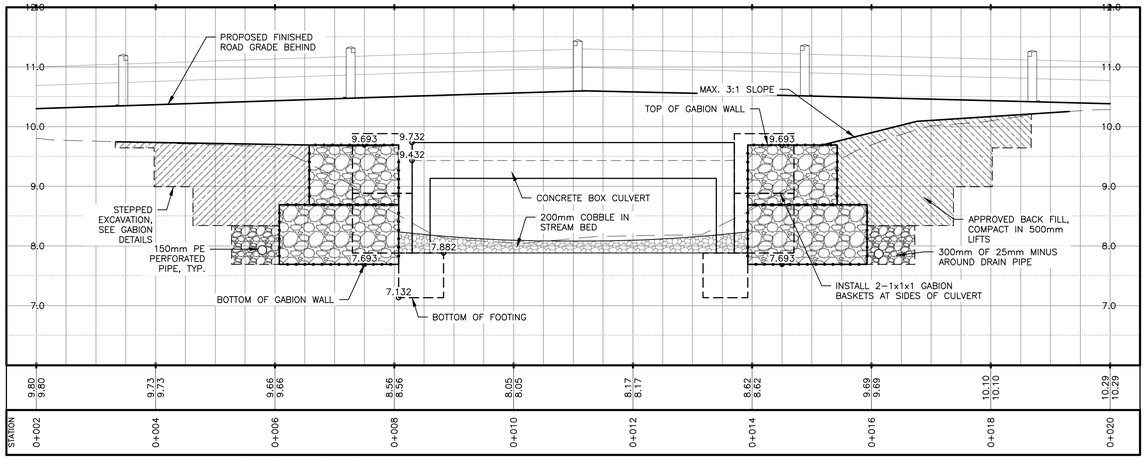
NIPISA STREET
PLAN

SHEET NO. C3

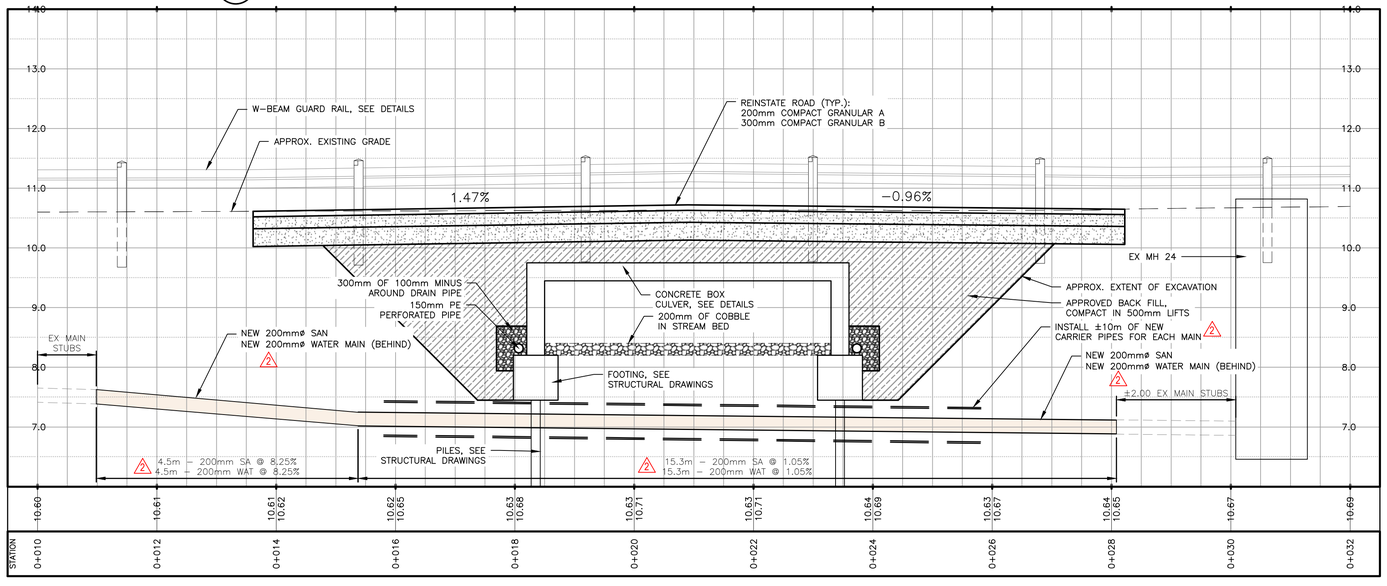
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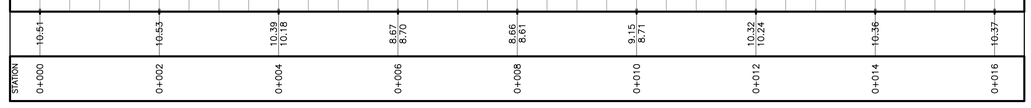
1 C4 N-S STREAM SECTION
1:50



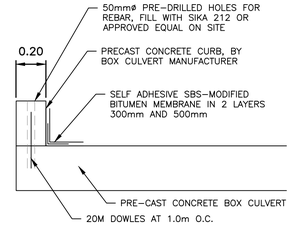
3 C4 DOWN STREAM SECTION
1:50



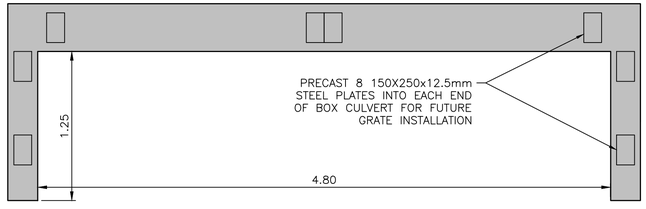
2 C4 ROAD SECTION
1:50



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.

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

PERMIT TO PRACTICE
DILLON CONSULTING LIMITED
Signature
Date AUGUST 18, 2026
PERMIT NUMBER: P 010
NT/NU Association of Professional Engineers and Geoscientists

2026-11-09
REGISTERED PROFESSIONAL ENGINEER
TOM GRABLEY
LICENSEE
L 5088
NT/NU

ISSUED FOR TENDER

Iqaluit

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	ISSUE FOR ADDENDUM #2	11-09-2026	SD
1	ISSUE FOR TENDER	09-04-2026	SJG

DESIGN SJG | REVIEWED BY SJG
DRAWN MWC | CHECKED BY LW
DATE SEPTEMBER 2026
SCALE AS NOTED

CITY OF IQALUIT
NIPISA AND QEW CULVERT REPLACMENTS

PROJECT NO. 24-8833

NIPISA STREET PROFILES AND DETIALS

SHEET NO. C4

FILENAME: P:\2024\248833 NIPISA AND QEW CULVERT REPLACEMENTS\3. WORK\DRAWINGS\03 - CONTRACT\248833-02-PLPR-CULVERT.DWG
PLOT DATE: 2026-11-09 @ 11:59:12 AM PLOT SCALE: 12.585 PLOT STYLE: CANRAL - MARY RIVER.CTB
DILLON CONSULTING LIMITED, 1 NICHOLAS BEAVER ROAD, UNIT 101, IQALUIT, NUNAVUT, X0A 0H0, CANADA
DILLON CONSULTING LIMITED, 1150 MORRISON DRIVE, SUITE 410, OTTAWA, ONTARIO, K2H 1B7, CANADA
DILLON CONSULTING LIMITED, 1558 WILLIAM STREET, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209