

ENGINEERING &
PUBLIC WORKS

Kentville

*TOWN OF KENTVILLE CAPITAL 2024
SANITARY SEWER REHABILITATION ELM AVE
CONTRACT #2024-09
CLOSING: WEDNESDAY JUNE 12, 2024, AT
2:01PM
KENTVILLE, NS*

*SET NO. 1
JUNE 2024*

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Town of Kentville: Sanitary Sewer Rehabilitation Elm Avenue

Owner / Engineer:

Town of Kentville
354 Main Street
Kentville, NS B4N 1K6

1. Tender Submission

- .1 Submit completed tender form for above project in sealed envelope marked as follows:

Tender for:

“Town of Kentville: Sanitary Sewer Rehabilitation Elm Avenue”

Closing: **2:01pm local time Wednesday, June 12, 2024**, at the Town of Kentville office.

Town of Kentville
Attn: Dave Bell, P.Eng.
Director of Engineering & Public Works
354 Main Street, Kentville, NS B4N 1K6
P: 902-679-2521

2. Safety Certification

- .1 Submit with tender a copy of tenderer’s current and valid safety accreditation issued by Nova Scotia Workers’ Compensation Board or Certificate of Recognition (COR) issued by Construction Safety Nova Scotia.
- .2 Out-of-province tenderers with a current and valid COR from a Canadian Federation of Construction Safety Associations member shall obtain and submit a current and valid Letter of Good Standing from Construction Safety Nova Scotia.

3. Workers' Compensation

- .1 Submit with tender a copy of tenderer’s current and valid clearance letter issued by the Workers’ Compensation Board of Nova Scotia.
 - .2 Out-of-province tenderers shall submit a current and valid clearance letter from a government workers' compensation board but must register with the Nova Scotia Workers’ Compensation Board prior to being awarded the Contract.
-

4. Tender Opening

- .1 Tenders will be opened on **Wednesday, June 12, 2024 at 2:01pm at the Kentville Town Office at 354 Main Street.**
- .2 Tender amendments will be disclosed at public openings.

5. Document Fee

- .1 **Firms must register with the Town of Kentville or their tender will be considered invalid.** To receive full tender documents contact 902-679-2521 or email dbell@kentville.ca and tender documents will be issued in digital format at no charge. Paper documents are also available for a fee of \$100.00 payable to Town of Kentville.

6. Accuracy of Referencing

- .1 Indexing and cross-referencing are for convenience only.

7. Conditions of Tendering

- .1 Take full cognizance of content of all Contract Documents in preparation of tender. Refer to Section 00 41 43 – Tender Form, Subsection 3.9 for a complete list of Contract Documents.

8. Tenderers to Investigate

- .1 Tenderers will be deemed to have familiarized themselves with existing site and working conditions and all other conditions which may affect performance of the Contract. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time.

9. Clarification and Addenda

- .1 Notify Engineer not less than two (2) Working Days before tender closing of omissions, errors or ambiguities found in Contract Documents. If Engineer considers that correction, explanation or interpretation is necessary, a written addendum will be issued. All addenda will form part of Contract Documents.
- .2 Confirm in the tender form that all addenda have been received. Tenderers are solely responsible to obtain and acknowledge the receipt of addenda at time of tender closing.

10. Preparation of Tender

- .1 Legibly complete tender form provided with Project Documents. Tender all items and fill in all blanks. Have corrections initialed by person signing tender.

11. Taxes .1 Include all taxes in prices except Harmonized Sales Tax (HST).
-

12. Tender Security

- .1 Provide tender security in the minimum amount of ten percent (10%) of total price including HST. Provide security with tender in the form of a certified cheque or money order payable to the Owner, a bid bond on CCDC Form 220, or other Owner-approved form.

13. Contract Security

- .1 Refer to Section 00 72 45 – General Conditions, subsection GC11.2 – CONTRACT SECURITY for form of contract security. Refer to Project Documents for amount of contract security.

14. Insurance

- .1 Refer to Section 00 72 45, General Conditions, subsection GC11.1 - INSURANCE, for insurance requirements.

15. Form of Agreement

- .1 Form of Agreement is attached for information purposes only until execution of the Contract.

16. Return of Tender Security

- .1 Tender security will be returned to:
 - .1 All except the three lowest acceptable tenderers within five (5) Working Days of tender opening.
 - .2 Two (2) remaining unsuccessful tenderers within ten (10) Working Days of date of award.
 - .3 Successful tenderer following receipt by Owner of executed agreement, specified contract security, and insurance documents.

17. Amendment or Withdrawal of Tender

- .1 Tenders may be amended or withdrawn prior to tender closing.
 - .2 Amendment of individual Unit Prices is the only acceptable price amendment. Amendments shall not disclose either original or revised total price.
 - .3 Head amendment or withdrawal as follows: "[Amendment/Withdrawal] of tender for [Name of Project/Contract] [Contract number, if applicable]". Sign as required for tender, and submit at address given for receipt of tenders. In order to be considered, submissions shall be received prior to time of tender closing.
-

18. Offer, Acceptance, Rejection

- .1 The Owner reserves the right to accept or reject any tender and to cancel the tendering process and reject all tenders at any time prior to the award of Contract without incurring any liability to affected tenderers.

ADD:

18. Contingency Allowance

- .1 A contingency allowance is included in Section 00 41 43. This amount covers any cost for extra work as directed by the Engineer which is not included in the items in the Schedule of Quantities and Unit Prices.

19. On-Site Materials

- .1 On-site materials will only be paid for as they are incorporated in the works.

20. Time .1 Time is considered to be of the essence.

21. Project Schedule

- .1 The project MUST be completed on or before September 30, 2024.

22. Safety .1 Safety shall be of primary importance at all times and the current safety regulations of the Nova Scotia "Occupational Health and Safety Act" must be adhered to at all times.

23. Procurement Policy

- .1 All contracts must be awarded in a manner that is transparent, competitive, and consistent with value for money principles and meet NS Procurement policies.

DELETE: RECORD DRAWINGS General Requirements, Section 01 10 00, Subsection 8.1 and 8.2

ADD:

24. As-built Records/Drawings

- .1 **Record information is the responsibility of the contractor. The contractor will provide the Town of Kentville with a coordinate file in NAD83 UTM format containing survey grade 3D points for every fixture, including valves, bends, tees, services at main and property line, MH tops and inverts, hydrant tops, centerline, shoulder, and ditch points (where applicable). Main lines are to be located at a minimum measurement of 30 m.**

1. SALUTATION:

- .1 To: TOWN OF KENTVILLE
354 MAIN STREET
KENTVILLE, NS B4N 1K6
- .2 For: CONTRACT #2024-09
2024 KENTVILLE CAPITAL WORKS
SANITARY SEWER REHABILITATION ELM AVE
- .3 From: _____

2. TENDERER DECLARES:

- .1 That this tender was made without collusion or fraud.
- .2 That the proposed work was carefully examined.
- .3 That the tenderer was familiar with local conditions.
- .4 That Contract Documents and Addenda No. ___ to ___ inclusive were carefully examined.
- .5 That all the above were taken into consideration in preparation of this tender.

3. TENDERER AGREES:

- .1 To enter into a contract to supply all labour, material and equipment and to do all work necessary to construct the Work as described and specified herein for the unit prices stated in Subsection 4 hereunder, Schedule of Quantities and Unit Prices.
- .2 That the estimated Contract Price shall be the sum of the products of the tendered unit prices multiplied by the estimated quantities in Subsection 4 hereunder excluding Harmonized Sales Tax (HST).
- .3 That this tender is valid for acceptance for 60 days from tender closing.
- .4 That measurement and payment for items listed in Subsection 4 hereunder shall be in accordance with corresponding items in Section 01 22 00 Measurement and Payment.
-

- .5 To execute in triplicate the Form of Agreement and forward same together with the specified contract security and insurance documents to the Owner within ten (10) Working Days of written notice of award.
- .6 That failure to enter into a formal contract and provide specified insurance documents and contract security within time required will constitute grounds for forfeiture of tender security.
- .7 That if tender security is forfeited, Owner will retain difference in money between amount of tender and amount for which Owner legally contracts with another party to perform the Work and will refund balance, if any, to tenderer.
- .8 That Contract Documents include:
 - .1 Standard Specification for Municipal Services listed in Table of Contents Page Dated May 2022.
 - .2 Tender Form
 - .3 Form of Agreement
 - .4 Supplementary Specifications
 - .5 Drawings

Drawing	Plan #	Latest Revision
Cover		
Sanitary Sewer Rehabilitation	C100	May 9, 2024
-0+042.31 TO 0+074.48 Elm Ave	C101	May 9, 2024
Details	C102	May 9, 2024

- .6 Addenda as issued and as confirmed in subsection 2.4 of this section.

4. SCHEDULE OF QUANTITIES AND UNIT PRICES

ITEM NO.	DESCRIPTION	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
SANITARY SEWER SYSTEM					
20.	Gravity Pipe Supply & installation of the following items including all excavation, bedding, pipe laying, backfill & compaction. All miscellaneous fittings, markers, concrete, air, video & pill testing, all surface restoration, patch paving and all else to complete the work as specified and as shown on the drawings.				
.1	200mm diameter DR35 PVC pipe	m	80	_____	_____
22.	Manholes				
.1	1050 dia precast concrete	ea	2	_____	_____
.3	Remove existing manhole (ExMHA)	ea	1	_____	_____
23.	Services				
.1	100mm off 200mm tee in main	ea	3	_____	_____
.2	100mm diameter DR35 PVC pipe to property line	m	30	_____	_____
.3	connect to existing 100mm sanitary lateral	ea	3	_____	_____
.4	200mm DR 35 PVC coupling to tie to existing pipe	ea	1	_____	_____
				TOTAL	_____

CONTRACT SUMMARY

.2 SANITARY SEWER SYSTEM
.3 CONTINGENCY

\$10,000.00

Subtotal

HST (15% of Subtotal)

Total Tender Price

5. COMPLETION TIME

- .1 Tenderer agrees to complete the Work within ____ weeks of written notification of award.

6. SIGNATURES*

DATED THIS _____ DAY OF _____, 2024.

[Seal]

Name of Firm Tendering

Witness

Signature of Signing Officer

Name and Title (Printed)

Witness

Signature of Signing Officer

Name and Title (Printed)

Company Address

Telephone No.

Fax No.

TENDERER'S HST REGISTRATION NO. _____.

*NOTE: Tenders submitted by or on behalf of any Corporation must be signed in the name of such Corporation by a duly authorized officer(s) or agent(s).

END

DEFINITIONS

The following definitions shall apply to all *Contract Documents*.

1. **Change Directive**
A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon an adjustment in *Contract Price* and *Contract Time*.
2. **Change Order**
A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:
 - a change in the *Work*;
 - the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
 - the extent of the adjustment in the *Contract Time*, if any.
3. **Construction Equipment**
Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.
4. **Consultant**
The *Consultant* is the person or entity identified as such in the Agreement. The *Consultant* is the Engineer or other entity licensed to practise in the province or territory of the *Place of the Work*. The term *Consultant* means the *Consultant* or the *Consultants* authorized representative.
5. **Contract**
The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities, and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.
6. **Contract Documents**
The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS and amendments agreed upon between the parties.
7. **Contract Price**
When *Unit Prices* form the basis of payment, the *Contract Price* is the sum of the product of each *Unit Price* stated in the *Schedule of Prices* multiplied by the appropriate actual quantity of each item that is incorporated in or made necessary by the *Work*, plus lump sums, if any, and allowances, if any, stated in the *Schedule of Prices*. When a lump sum stipulated price forms the basis of payment, the *Contract Price* is the amount stipulated in Article A-4 of the Agreement - CONTRACT PRICE.
8. **Contract Time**
The *Contract Time* is the time stipulated in paragraph 1.3 of Article A-1 of the Agreement - THE WORK from commencement of the *Work* to *Substantial Performance of the Work*.
9. **Contractor**
The *Contractor* is the person or entity identified as such in the Agreement. The term *Contractor* means the *Contractor* or the *Contractor's* authorized representative as designated to the *Owner* in writing.
10. **Drawings**
The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location, and dimensions of the *Work*, generally including plans, elevations, sections, details, schedules, and diagrams.
11. **Owner**
The *Owner* is the person or entity identified as such in the Agreement. The term *Owner* means the *Owner* or the *Owner's* authorized agent or representative as designated to the *Contractor* in writing, but does not include the *Consultant*.
12. **Place of the Work**
The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

- 13. Product**
Product or Products means material, machinery, equipment, and fixtures forming the *Work* , but does not include *Construction Equipment*.
- 14. Project**
The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.
- 15. Provide**
Provide means to supply and install.
- 16. Schedule of Prices**
The *Schedule of Prices* is the schedule listed in Article A-3 - CONTRACT DOCUMENTS identifying items of work, estimated quantities, units of measure, and *Unit Prices*.
- 17. Shop Drawings**
Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the *Work*.
- 18. Specifications**
The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, and the services necessary for the performance of the *Work*.
- 19. Subcontractor**
A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work*, or to supply *Products* worked to a special design for the *Work*.
- 20. Substantial Performance of the Work**
Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*. If such legislation is not in force or does not contain such definition, or if the *Work* is governed by the Civil Code of Quebec, *Substantial Performance of the Work* shall have been reached when the *Work* is ready for use or is being used for the purpose intended and is so certified by the *Consultant*.
- 21. Supplemental Instruction**
A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models, or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.
- 22. Supplier**
A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products* not worked to a special design for the *Work*.
- 23. Temporary Work**
Temporary Work means temporary supports, structures, facilities, services, and other temporary things, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.
- 24. Unit Price**
A *Unit Price* is the amount payable for a single unit of work as stated in the *Schedule of Prices*.
- 25. Value Added Taxes**
Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which is by the *Contractor* as imposed by the tax legislation.
- 26. Work**
The *Work* means the total construction and related services required by the *Contract Documents*.
- 27. Working Day**
Working Day means a day other than a Saturday, Sunday, statutory holiday or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

These Supplementary General Conditions amend Section 00 71 00 DEFINITIONS and Section 00 72 45 - GENERAL CONDITIONS.

SECTION 00 71 00 - DEFINITIONS

1. Page 2, after definition for Project, add definition for Project Documents as follows:

Project Documents

Project Documents consist of those documents prepared to supplement the Standard Specification for the Work on a specific Project. Where applicable, they consist of the Information for Tenderers, Tender Form, Form of Agreement, Supplementary Specifications, drawings and addenda.

2. Page 3, after definition for Specifications, add definition for Standard Specification as follows:

Standard Specification

The Standard Specification consists of Definitions, General Conditions, Supplementary General Conditions, Measurement and Payment, General Requirements, other technical specifications and standard details developed by the Nova Scotia Road Builders Association and the Consulting Engineers of Nova Scotia Joint Committee on Contract Documents and published with the title of Standard Specification for Municipal Services.

3. Page 3, after definition for Supplemental Instruction, add definition for Supplementary Specifications as follows:

Supplementary Specifications

Supplementary Specifications consist of the specifications for a specific project which amend or add to the Standard Specification.

4. Where the term "Consultant" is used throughout the General Conditions, revise to read "Engineer".

SECTION 00 72 45 - GENERAL CONDITIONS

5. GC5.4 BASIS OF PAYMENT FOR COST PLUS WORK

Page 16, delete clause 5.4.1 and replace with the following:

"5.4.1 Payment for cost plus work shall be based on the cost of such work, as provided in paragraph 5.4.2, plus a fee calculated as a percentage of the cost of such work, for the Contractor's overhead and profit. The percentage amount shall be ___% for work done by the Contractor's own forces and % for work done by Subcontractors but shall not be applied to the cost of Construction Equipment when such cost is based on rates which already include the Contractor's

overhead and profit.”

6. GC5.5 APPLICATIONS FOR PROGRESS PAYMENT

Page 17, delete clause 5.5.2 and replace with the following:

“5.5.2 Applications for payment shall be dated the last day of the agreed monthly payment period and the amount claimed shall be for the value, proportionate to the amount of the Contract, of Work performed at that date.”

Page 18, delete clause 5.5.6.

7. GC5.6 PROGRESS PAYMENT

Page 18, delete clauses 5.6.1 and 5.6.2 and replace with the following:

“5.6.1 The Consultant will issue to the Owner no later than five (5) Working Days after the receipt of an application for payment from the Contractor, submitted in accordance with GC 5.5 - APPLICATIONS FOR PROGRESS PAYMENT, a certificate for payment in the amount applied for, or such other amount as the Consultant determines to be properly due. If the Consultant amends the application, the Consultant will promptly notify the Contractor, in writing, giving reasons for the amendment.”

“5.6.2 The Owner shall make payment to the Contractor on account as provided in Article A-5 - PAYMENT of the Agreement no later than Fifteen (15) Working Days after the date of a certificate for payment issued by the Consultant.”

8. GC5.10 FINAL PAYMENT

Page 19, clause 5.10.4, change “5 Working Days” to read “ten (10) Working Days”.

9. GC10.1 TAXES AND DUTIES

Page 28, add the following clause 10.1.3:

“10.1.3 The Contractor will indicate on each application for payment, as a separate amount, the appropriate Harmonized Sales Tax the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract.”

10. GC10.2 LAWS, NOTICES, PERMITS AND FEES

Page 28, add the following clause 10.2.8:

"10.2.8 Various areas of Nova Scotia have requirements for posting non-refundable fees before excavations are carried out within public right-of-way. The Contractor is responsible for the determination of the requirement for each specific project and for the required deposits."

11. GC11.1 INSURANCE

Page 29, change \$2,000,000 policy limits to \$5,000,000 policy limits in clauses 11.1.1.1, 11.1.1.2 and 11.1.1.3.

Page 29, change \$2,500 deductible to \$5,000 deductible in clauses 11.1.1.1 and 11.1.1.4(1).

12. GC11.2 CONTRACT SECURITY

Page 31, add the following clause 11.2.3:

"11.2.3 The Contractor shall supply a Performance Bond and a Labour and Material Payment Bond, each in the amount of fifty percent (50%) of the estimated Contract Price plus Harmonized Sales Tax. Should it become apparent that the final cost of the Work will exceed the estimated Contract Price by more than ten percent (10%), the Contractor shall arrange to have the Bonds reissued, based on the projected final Contract Price plus Harmonized Sales Tax."

13. GC12.1 INDEMNIFICATION

Page 31, change indemnification limits from \$2,000,000 to \$5,000,000, two places, in clause 12.1.2.

-
1. GENERAL .1 This section specifies administrative, procedural and temporary requirements.
2. SUMMARY OF THE WORK .1 Refer to Supplementary Specifications for summary description of the Work.
3. SCHEDULING AND COORDINATION .1 Submit within five (5) Working Days of date of award detailed schedule for critical operations and performance of the Work by completion date. Revise, update and submit schedule as directed.
- .2 Schedule and perform the Work within hours and days established by authorities having jurisdiction in the Place of the Work.
- .3 If indicated in Project Documents, the Engineer will carry out necessary tests and inspections and will verify measurements required for record drawings so as not to cause delay.
- .4 Provide submittals and schedule delivery of products, as required, to meet the agreed schedule.
4. SETTING OUT THE WORK .1 Refer to Project Documents for survey control points.
- .2 Set elevations and lay out the work in detail from control points.
5. EXISTING SITE CONDITIONS .1 Before commencing the Work, notify Engineer if site conditions at the Place of the Work differ significantly from those indicated. Engineer will investigate and issue appropriate instructions.
- .2 Obtain utility locates before commencing any work.
6. PROJECT MEETINGS .1 Engineer will arrange project meetings, set times and record and distribute minutes.

7. SUBMITTALS

- 7.1 Shop Drawings
- .1 On shop drawings clearly show in detail the dimensions, materials of construction, finish, performance, service and installation requirements, and other pertinent information.
 - .2 Check shop drawings prior to submission. Determine and verify all field measurements, field construction criteria, materials, catalogue numbers and similar data and check and coordinate each shop drawing with the requirements of the Work and Contract Documents. Sign and date each shop drawing to confirm compliance with above requirements.
 - .3 Engineer will not review shop drawings where it is evident that they do not meet the requirements of 7.1.1 and 7.1.2 above.
 - .4 Submit for review one (1) PDF copy of shop drawings or as indicated in Project Documents.
 - .5 After review Engineer will return one (1) PDF copy of shop drawings or as indicated in Project Documents.
 - .6 Make any corrections as noted, and resubmit, if required.
 - .7 Do not proceed with work involving relevant products until completion of shop drawing review.
- 7.2 Samples
- .1 Submit samples for review as required in Supplementary Specifications. Indicate locations of sources.
 - .2 Do not deliver relevant products to site until completion of review.
- 7.3 Mix Design
- .1 Submit mix design for concrete and asphalt materials as required in Supplementary Specifications.
- 7.4 Design Verification of Temporary Works
- .1 Submit plans sealed by a professional engineer registered to practice in Nova Scotia for temporary works as required in Contract Documents.

- 7.5 Operating and Maintenance Data
- .1 Submit three (3) paper copies and one (1) PDF copy of the following prior to application for final payment:
 - .1 General description, list of equipment including nameplate information, installation, operation and maintenance instructions, and parts list.
 - .2 Names, addresses and phone numbers of Sub-Contractors, suppliers and manufacturers.
 - .3 Guarantees and warranties.
 - .2 Type lists and notes. Use drawings, diagrams and manufacturer's literature.
- 7.6 Test Results
- .1 Submit one (1) PDF copy of certificates and monitoring, test and inspection reports or as indicated in Project Documents.
8. RECORD DRAWINGS
- .1 Obtain data necessary to prepare record drawings.
 - .2 Do not bury pipework and appurtenances or other portions of the Work until necessary measurements have been taken.
 - .3 Procedure and responsibility as indicated in Project Documents.
9. QUALITY CONTROL
- .1 Provide Owner and Engineer with access to the Work, and to locations where products to be incorporated into the Work are being prepared.
 - .2 Cooperate with and assist Engineer in conducting necessary tests.
 - .3 Notify Engineer in advance of requirements for tests and inspections.
 - .4 Arrange for inspections or tests by authorities other than the Engineer.
 - .5 Do not bury pipework and appurtenances or other portions of the Work until Engineer has advised that necessary tests or inspections are completed.
 - .6 Engineer may order any buried work to be uncovered for examination. Defective work shall be repaired by Contractor. If work was

previously approved and no defects are found, Owner will reimburse Contractor's costs.

- .7 Owner will appoint and pay for services of testing laboratory except for:
 - .1 Inspection and testing required by laws, ordinances, rules and regulations.
 - .2 Tests specified to be performed by Contractor.
 - .3 Inspection and testing performed exclusively for convenience of Contractor.
 - .4 Testing, adjustment and balancing of mechanical and electrical equipment systems.

10. TEMPORARY
SITE FACILITIES

- .1 Obtain all approvals required for the disposal of sanitary sewage from any facilities including offices, washrooms and bunkhouses.
- .2 Access:
 - .1 Provide and maintain adequate access to project site.
 - .2 Build and maintain temporary roads and walks as required.
 - .3 Provide access for pedestrians to property and premises adjacent to the Work.
- .3 Engineer's Site Office:
 - .1 Provide Engineer's site office, when required by Project Documents, as follows:
 - .1 Minimum floor area of ten square metres.
 - .2 Heat, air conditioning, light and internet connection.
 - .3 Desk: 1.0 x 1.5 m plan table, shelving and a four-drawer lockable filing cabinet.
 - .2 Maintain in clean condition.
 - .3 Remove when no longer required by Engineer but not later than attainment of Substantial Performance of the Work.
- .4 Provide and maintain sanitary facilities for site personnel.
- .5 Remove temporary facilities from site when no longer required.
- .6 Temporary power will be provided by the party identified in the Supplementary Specifications.

Coordinate with electrical utility when installing temporary power.

- .7 Temporary water will be provided by the party identified in the Supplementary Specifications.

11. DELIVERY OF MATERIALS AND USE OF THE SITE

- .1 Confine equipment, products, and operations to limits indicated.
- .2 Deliver, store and maintain materials so as to avoid damage.

12. TRAFFIC CONTROL

- .1 Provide traffic control in accordance with Temporary Workplace Traffic Control Manual issued by Nova Scotia Transportation and Infrastructure Renewal.
- .2 In urban areas, consult with local authorities having jurisdiction for possible additional or special requirements.
- .3 Meet with local authorities having jurisdiction prior to start of construction to determine allowable diversions of vehicle and pedestrian traffic, and access to construction area.
- .4 Provide traffic control personnel, signals, lights and other traffic control methods where required.
- .5 Provide and maintain signs, delineators, barricades, barriers, and miscellaneous warning devices to indicate construction activities or other temporary and unusual conditions.

13. SUBSTITUTIONS

- .1 Requests for substitutions will not be considered until after award of Contract.
- .2 Proposals for substitution will only be considered by Engineer in the following circumstances:
 - .1 Products specified are not available; or
 - .2 Delivery of specified products would unduly delay completion; or
 - .3 Alternate products will result in reduction in Contract Price.
- .3 Provide information on proposed substitutions

in adequate detail to permit evaluation.

- .4 Submit to the Engineer drawings and specifications for modifications, adjustments or additions required by substitutions in same detail as presented in Contract Documents.
- .5 Do not make changes or substitutions without written consent of Engineer.
- .6 Subject to prior notice Contractor may be back-charged for time spent by Engineer in evaluating substitutions.

14. STANDARDS AND
REFERENCE
DOCUMENTS

- .1 Standards and reference documents in effect at time of tender closing referred to in Specifications are an integral part of Contract Documents.

15. WASTE
MANAGEMENT AND
DISPOSAL

- .1 Prepare, for review, waste management plan, including source separating plan and waste disposal plan.
- .2 Maintain site and adjacent areas in tidy condition free from accumulation of waste products and debris.
- .3 Upon attaining Substantial Performance of the Work remove surplus products, tools, machinery and equipment.
- .4 Completion of cleanup is required for Substantial Performance of the Work.

16. PROJECT
CLOSEOUT

- .1 Final Cleaning:
 - .1 When the Work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining work.
 - .2 Remove waste materials and debris from site at regularly scheduled times or dispose of as directed by Owner. Do not burn waste materials on site.
 - .3 Leave Work broom clean before inspection process commences.
- .2 Review/Takeover Procedures:
 - .1 Prior to application for Certificate of

Substantial Performance, review the Work and confirm it is substantially complete, and construction deficiencies are identified. Notify Engineer, in writing, of satisfactory completion of the Work and request a review.

.2 During Engineer's review, a list of deficiencies and defects will be tabulated. Correct same.

.3 When Engineer considers deficiencies and defects have been corrected and the requirements of Contract have been performed, make application for final payment.

PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies requirements for constructing gravity sanitary sewers. Work includes supply, installation, and testing of pipe, fittings and service connections.
- 1.2 Related Sections .1 Concrete: Section 03 30 00
.2 Earthwork: Section 31 20 00
.3 Reinstatement: Section 32 98 00
.4 Precast Manholes, Catch Basins and Structures: Section 33 39 00
.5 Standard Details: Section 39 00 00
- 1.3 Reference Standards .1 ASTM C14M-15a, Standard Specification for Non-reinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric).
.2 ASTM C76M-19, Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric).
.3 AWWA C110/A21.10-12, Ductile-Iron and Gray-Iron Fittings.
.4 AWWA C901-17, Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13mm) Through 3 In. (76mm), for Water Service.
.5 AWWA C906-15, Polyethylene (PE) Pressure Pipe and Fittings 4 In. 65 In. (100mm Through 1,650mm) for Waterworks.
.6 CSA A257 Series-14, Standards for Concrete Pipe and Manhole Sections.
.7 CSA B1800-18, Thermoplastic Non-pressure Piping Compendium.
.8 National Association of Sewer Service Companies (NASSCO) Guideline Specifications.

1.4 Certificates .1 Upon request, submit manufacturer's test data and certification that products and materials meet requirements of this Section in accordance with Section 01 10 00 for items listed in Supplementary Specifications.

1.5 Handling And Storage .1 Handle and store pipe and fittings in such manner as to avoid damage. Do not use chains or cables passed through pipe bore.
.2 Store gaskets in cool location, out of direct sunlight, and away from petroleum products.

PART 2 - PRODUCTS

2.1 General .1 Diameter, material, and strength class of pipe and fittings: as indicated.

2.2 Concrete Pipe And Fittings .1 Pipe and Fittings:
.1 Non-reinforced: to ASTM C14M or CSA A257.1.
.2 Reinforced: to ASTM C76M or CSA A257.2.
.2 Joints: bell and spigot with flexible rubber gaskets to CSA A257.3.

2.3 Polyvinyl Chloride Pipe And Fittings .1 Type PSM Polyvinyl Chloride: to CSA B1800.
.2 Joints: bell and spigot with rubber gasket.

2.4 Polyethylene Pipe and Fittings .1 Pipe:
.1 13mm to 76mm diameter: to AWWA C901.
.2 100mm diameter and larger: to AWWA C906.
.2 Joints:
.1 Thermal Butt Fusion
.2 Mechanical Connections: polyethylene flange end with metal back-up ring.
.3 Electrofusion.
.3 Fittings:
.1 Polyethylene: to AWWA C901 and AWWA C906.
.2 Flanged cast-iron: to AWWA C110.

- 2.5 Service Saddles
- .1 Concrete main: cast-iron or PVC with gasket, stainless steel strap or bolt on, and O-ring in branch end.
 - .2 PVC main: PVC strap-on saddle, in-line tee or wye, with gasket, all stainless steel strap and O-ring in branch end.

- 2.6 Marker Stakes
- .1 Timber, 40mm x 90mm.

- 2.7 Grout
- .1 Non-shrink: to Section 03 30 00.

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Inspect products for defects and remove defective products from site.
 - .2 Confirm pipe and fittings are clean before installation.

- 3.2 Excavation, Bedding and Backfilling
- .1 Perform excavation, bedding and backfilling in accordance with Section 31 20 00.

- 3.3 Pipe Installation
- .1 Lay and join pipe and fittings as specified herein and according to manufacturer's published instructions.
 - .2 Lay pipe and fittings on prepared bed, true to line and grade indicated, within following tolerances:
 - .1 Horizontal Alignment: 50mm.
 - .2 Vertical Alignment: the lesser of 13mm or one half the rise per pipe length.
 - .3 Commence laying at outlet and proceed in upstream direction with bell ends of pipe facing upgrade.
 - .4 Prevent entry of bedding material, water or other foreign matter into pipe. Use temporary watertight bulkheads when pipelaying is not in progress.

- .5 Install gaskets in accordance with manufacturers published instructions. During cold weather, store gaskets in heated area to promote flexibility.
- .6 Install plastic pipe in accordance with CSA B1800.
- .7 Align pipe before joining.
- .8 Support pipes as required to maintain concentricity until joint is properly completed.
- .9 Keep pipe joints free from mud, silt, gravel or other foreign material.
- .10 Join polyethylene pipe in accordance with pipe manufacturer's written instructions.
- .11 Avoid displacing gasket or contaminating with dirt, petroleum products, or other foreign material. Remove, clean, reinstall and lubricate gaskets so disturbed.
- .12 Complete each joint before laying next length of pipe.
- .13 Where deflection at joints is permitted, deflect only after joint is completed. Do not exceed maximum joint deflection recommended by manufacturer.
- .14 Where a flexible joint is not integral to the structure, provide flexible joint not more than 1 metre from outside face of structure.
- .15 Cut pipe as required for fittings or closure pieces, square to centerline, and as recommended by manufacturer.
- .16 Make watertight connections to manholes. Do not use non-shrink grout unless approved by the Engineer.

3.4 Undercrossing

- .1 Provide shop drawings showing proposed method of installation for pipe in undercrossing including blocking method to guide pipe.

- .2 Excavate working pit according to reviewed shop drawings.
- .3 Dewater area of excavation and undercrossing.
- .4 Place jacking, boring or tunneling equipment in working pit to approved line and grade of the proposed pipe.
- .5 Install encasing pipe to proposed line and grade as indicated.
- .6 Use mechanical or welded type joints for encasing pipe.
- .7 After encasing pipe has been installed, check line and grade for approval.
- .8 Remove any soil that remains in the casing pipe.
- .9 Insert pipe into encasement pipe, starting from the working pit.
- .10 Place pipe one (1) length at a time outside encasement pipe. Maneuver pipe into position.

3.5 Service_
Connections

- .1 Lay and join pipe and fittings to manufacturers published instructions.
- .2 Maintain minimum 2% grade or as required by authority having jurisdiction.
- .3 Maintain a maximum slope of 8% grade. Where greater slopes are required, obtain Engineer's approval.
- .4 Use tee or wye fittings or saddles for connections to sewer. For saddle connections cut hole using appropriate equipment. Obtain the Engineer's approval.
- .5 Make up required horizontal and vertical bends from standard bends of 45 degrees or less, separated by straight section of pipe, having minimum length of four (4) pipe diameters. Use long sweep bends where possible.
- .6 Plug service laterals with watertight caps or plugs at termination points. Paint stub ends

and caps RED.

- .7 Place temporary marker stakes at end of each plugged or capped sewer service lateral, extending from pipe end at pipe level to 600mm above grade. Paint exposed portion of stake RED with designation SAN in black.

3.6 Testing

- .1 Notify the Engineer at least 24 hours in advance of all proposed tests. Perform tests in presence of Engineer.
- .2 Flush sewers and related appurtenances to remove foreign materials.
- .3 Provide labour, equipment and materials required to perform testing.
- .4 If water used for flushing or testing is obtained from a potable water supply, the potable water supply is to be continuously separated from the service being flushed or tested by an air gap or a level of protection equal to or greater than that provided by a double check valve backflow prevention device.
- .5 Test each section of sewer. A section is the length of pipe between successive manholes or termination points, including service connections to the street line or termination point.
- .6 Locate and repair defects if test fails. Retest. Have repair method reviewed by the Engineer prior to retesting.
- .7 Repair visible leaks regardless of test results.
- .8 Exfiltration test:
 - .1 Fill section with water to displace air from main and service connections. Fill and maintain nominal head on concrete pipe 24 hours before testing to allow absorption of water by pipe material.
 - .2 Add water to establish test head of 3 metres over either crown of pipe, measured at highest point of section, or level of static ground water, whichever is greater. Do not exceed net internal head of 8 metres.

- .3 Maintain test head for 1 hour.
- .4 Measure and record volume of water required to maintain head during test period.
- .9 Infiltration test:
 - .1 Conduct infiltration test in place of exfiltration test where level of static ground water is 750mm or more above crown of pipe measured at highest point of section. No increase in infiltration rate will be allowed if head exceeds 750mm.
 - .2 Install watertight plug at upstream end of section.
 - .3 Discontinue dewatering minimum of three (3) days before taking test measurements.
 - .4 Place 90 degree V-notch weir, in invert of main at downstream end of section. Add water until flow is observed through notch.
 - .5 Measure and record total volume of flow for one hour.
- .10 Allowable leakage: determined by the following formula:

$$L = F \times D \times \frac{S}{100}$$

where:

- L = allowable leakage in litres per hour
- D = Diameter in mm
- S = Length of section, in metres
- F = leakage factor, (litres per hour per mm of diameter per 100 metres of sewer):

EXFILTRATION TEST:

- Porous Pipe F = 0.12 litre
- Non-Porous Pipe F = 0.02 litre

INFILTRATION TEST:

- Porous Pipe F = 0.10 litre
- Non-Porous Pipe F = 0.02 litre

- .11 Low Pressure Air Testing:
 - .1 Locate and repair defects if test fails. Retest. Have repair method reviewed by Engineer prior to retesting.
 - .2 Repair visible leaks regardless of test results.
 - .3 **CAUTION:** FOR SAFETY OF PERSONNEL AND PUBLIC, OBSERVE PROPER PRECAUTIONS DURING AIR TESTING. USE TEST EQUIPMENT DESIGNED TO OPERATE

ABOVE GROUND. DO NOT PERMIT PERSONNEL IN TRENCH DURING TESTING. DO NOT AIR TEST PIPE WITH DIAMETER GREATER THAN 600mm.

.4 Provide air testing equipment meeting the following requirements:

.1 Air Blower: 14 litres/sec, maximum pressure 70 kPa continuous.

.2 Pressure Relief Valve: Sized to relieve full blower capacity at maximum blower pressure. Range 20 - 70 kPa, adjustable.

.3 Pressure Gauges: Range 0 to 70 kPa with accuracy +/- 0.25 kPa.

.5 Provide plugs at each end of section, with one plug equipped for air inlet connection.

.6 Fill test section slowly until a constant pressure of 28 kPa is reached. If ground water is above section being tested, Engineer may recommend increase in air pressure.

.7 Allow minimum 2 minutes for air temperature to stabilize, adding only amount of air required to maintain pressure.

.8 After 2 minute period, shut off air supply.

.9 Decrease pressure to 24 kPa. Measure time required for pressure to reach 17kPa. Minimum time allowed for pressure drop is as follows:

<u>Pipe Diameter (mm)</u>	<u>Minimum Time</u> <u>Min:Sec</u>
100	1:53
150	2:50
200	3:47
250	4:43
300	5:40
375	7:05
450	8:30
525	9:55
600	11:20

3.7 Deflection Testing

.1 Measure deflection of plastic pipe by pulling a deflection gauge through each pipe from manhole to manhole after backfilling.

.2 Provide deflection gauge to measure a 7 1/2% deflection. Gauges to be a "Go-No-Go" device similar to Standard Detail 33 31 00-02.

- .3 Within thirty days after installation, pull a deflection gauge measuring 7 1/2% deflection through the installed section of pipe. If test fails locate defect and repair. Retest using same methodology.
 - .4 Thirty days prior to completion of warranty period, pull a deflection gauge measuring 7 1/2% deflection through the installed section of pipe. If test fails, locate defect and repair. Retest using same methodology.
 - .5 Record deflection test with CCTV inspection specified in subsection 3.8 herein.
- 3.8 Closed
Circuit Television
Inspection
- .1 Conduct closed circuit television inspection procedures to meet National Association of Sewer Services Companies (NASSCO) Performance Specification Guidelines.
 - .2 Equipment:
 - .1 Provide equipment meeting following requirements:
 - .1 Self-contained, self-leveling monitoring unit and pan-tilt camera with remotely controlled lighting system capable of varying the illumination.
 - .2 Picture quality shall produce continuous 600-line resolution picture, showing entire periphery of pipe.
 - .3 A meter device with readings above ground or marking on cable to clearly identify exact location of camera.
 - .3 Inspection:
 - .1 Perform inspection of pipe from manhole to manhole by passing TV camera through sewer in direction of flow.
 - .2 Classify results in accordance with National Association of Sewer Service Companies (NASSCO) Performance Specification Guidelines.
 - .4 Records:
 - .1 Maintain inspection record in log form, during television inspection.
 - .2 Log to include location of each fault and service lateral distance measured from centreline of reference manhole and position referenced to axis of pipe.
 - .3 Photograph fault from the television

screen. All photographs to be clear and precise with distinct definition of fault.

.4 Include detailed technical description with photographs as supporting data for each fault.

.5 Provide minimum of two (2) photographs for each sewer main section televised, detailing typical joint, and typical building service lateral.

.6 All photos and videos to be in colour.

.7 Identify deflection gauge size in report.

.5 Reports:

.1 Provide a composite report of TV inspection. Enclose report in binder on letter size paper. Include following pages and information.

.1 Title page identifying project, camera operator and dates of inspection.

.2 Index page identifying street name, section from manhole to manhole, page number or numbers where information for section is contained.

.2 Organize inspection records in sequence from upstream manhole to downstream manhole.

.3 Report on each sewer main section to contain:

.1 Heading:

.1 Street name.

.2 Manhole numbers applicable to section.

.3 Reference drawing number, if applicable.

.4 Weather on the day of inspection.

.5 Statement of soil condition in area of inspection, i.e., dry, damp, wet, frozen.

.6 Date of inspection.

.2 Key Plan, showing corresponding manhole numbers, magnetic north, horizontal distance, pipe and material between manholes, and direction of flow.

.3 Inspection findings for each sewer main section to include:

.1 Location of all faults.

.2 Photographs of all faults.

.3 Location of all service laterals.

.4 One photograph each of typical joint and typical when service

laterals faults are not found.

- .4 Place photographs on left-hand page and place corresponding description on right-hand page. Number all photographs in order. Number beside photograph to correspond with description number.
- .5 Enclose all pages of report in transparent sheet protector.
- .6 Accuracy:
 - .1 Maximum permissible error in accuracy to be within following limits of fault location:
 - .1 Up to 375mm pipe: $\pm 75\text{mm}$ per 100 m of length.
 - .2 450mm - 600mm pipe: $\pm 150\text{mm}$ per 100 m of length.
 - .3 750mm - 900mm pipe: $\pm 225\text{mm}$ per 100 m of length.
- .7 Video Record:
 - .1 Supply a complete record of all inspections in digital format.
 - .2 Index all files, listing sections of inspections.
 - .3 Submit thumb drive or CD/DVD with written reports to Engineer.
- .8 Repeat Inspection:
 - .1 Prior to repairs, have methods reviewed by the Engineer. Repair faults detected during television inspection. Repeat television inspection at no additional cost.

PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies requirements for constructing precast concrete manholes, catchbasins and structures. Work includes supply and installation of concrete bases, precast sections, metal castings and testing.
- 1.2 Related Sections .1 Concrete Section 03 30 00
.2 Metal Fabrications Section 05 50 00
.3 Earthwork Section 31 20 00
.4 Water Mains Section 33 11 00
.5 Sanitary Sewers Section 33 31 00
.6 Pressure Sewers Section 33 34 00
.7 Storm Sewers and Culverts Section 33 40 00
.8 Standard Details Section 39 00 00
- 1.3 Reference Standards .1 ASTM A48/A48M-03(R2012), Gray Iron Castings.
.2 ASTM C478M-15A, Precast Reinforced Concrete Manhole Sections (Metric)
.3 CAN/CSA A257 Series-14, Standards for Concrete Pipe and Manhole Sections.
.4 CAN/ULC S701-2011, Thermal Insulation, Polystyrene Boards and Pipe Covering
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 01 10 00 for items listed in Supplementary Specifications.
- 1.5 Handling and Storage .1 Prevent damage to materials during storage and handling in accordance with the manufacturer's written instructions.

- .2 Store gaskets in cool location out of direct sunlight, and away from petroleum products.

PART 2 - PRODUCTS

- 2.1 General .1 Diameter and type: as indicated.
- 2.2 Precast Bases_ and Sections .1 Precast Concrete Bases and Sections: to ASTM C478M or CSA A257.
- 2.3 Gaskets .1 O-Rings: to manufacturer's standard.
.2 Bituminous Compound: precast manufacturer's recommended compound.
- 2.4 Metal Castings .1 Frames, covers and gratings: to ASTM A48, gray cast iron, factory coated.
- 2.5 Waterproofing .1 Waterproofing: type specified in the Project Documents.
- 2.6 Insulation .1 Rigid Insulation: to CAN/ULC S701, Type 4, extruded polystyrene.
- 2.7 Concrete .1 Concrete: to Section 03 30 00, at 28 days, slump 80mm ±20mm minimum compressive strength of 35 MPa, and maximum water cement ratio of 0.45, air entrainment, 5 - 8% total air content.
.2 Grade Adjustment: manufactured type or cast-in-place type as indicated.
- 2.8 Non-Shrink_ Grout .1 Pre-mixed, dry pack or pourable type containing non-metallic aggregate, plasticizing agents and cement, minimum compressive strength of 45 MPa at 28 days.
- 2.9 Ladders .1 In accordance with the Project Documents.

PART 3 - EXECUTION

- 3.1 Preparation .1 Inspect products for defects and remove defective products from site.
- 3.2 Excavation and Backfill .1 Excavate and backfill to Section 31 20 00.
- 3.3 Installation .1 Construct units as indicated.
- .2 Complete units as pipe laying progresses.
- .3 Cast or set base on 150mm thick pipe bedding or material as indicated in the Project Documents compacted to 95% Standard Proctor Density or as indicated in the Project Documents. Top of base to be level.
- .4 Place stubs at elevations and in positions indicated. Provide flexible pipe joints within 1 metre of outside face of poured-in-place and precast structure where there is no in-wall gasket for pipe sizes up to and including 750mm diameter.
- .5 Form manhole bases to provide smooth U-shaped channels with depth equal to diameter of pipes or as indicated. Curve channels smoothly and slope uniformly from inlet to outlet. Benching to drain towards channel, 4% maximum slope.
- .6 Install base section of precast shafting on cast-in-place base as indicated and assure watertight joint.
- .7 Install gaskets in accordance with manufacturer's published instructions.
- .8 Install precast sections plumb and true with opening centered over upstream pipe.
- .9 Make all joints watertight in sanitary sewer manholes and valve chambers.
- .10 Install ladder if required by Project Documents.
-

- .11 Set frame and cover or grating to elevation and slope indicated. Use cast-in-place concrete for adjustment and secure frame in place with cement grout or use manufactured type.
- .12 Clean debris and foreign material from unit. Remove fins and sharp projections. Prevent debris from entering system.

3.4 Installation
in Existing System

- .1 Installing units in existing systems:
 - .1 Where new unit is to be installed in existing run of pipe, confirm full support of existing pipe during installation and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
 - .2 Make joints watertight between new unit and existing pipe.
 - .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.

3.5 Adjusting Tops
Of Existing Units

- .1 Remove existing gratings and frames and store_ for re-use at locations designated by Engineer.
- .2 Sectional units:
 - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
 - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600mm use standard modoloc or grade rings.
- .3 Monolithic units:
 - .1 Raise monolithic units by roughening existing top to achieve proper bond and extend to required elevation.
 - .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
 - .3 When monolithic units with tapered upper section are to be lowered more than 150mm, remove concrete for entire depth of taper plus

as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.

.4 Install additional manhole ladder rungs in adjusted portion of units as required.

.5 Re-use existing gratings, frames as directed by the Engineer.

.6 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

3.6 Sealing over Existing Units

.1 Fill with cast-in-place concrete approved by Engineer.

3.7 Testing

.1 Test sanitary sewer manholes and structures.

.2 Provide labour, equipment and materials required to perform testing.

.3 Backfill prior to testing.

.4 Notify Engineer 24 hours in advance of proposed test. Do test in presence of Engineer.

.5 Test method: as indicated and in accordance with the authority having jurisdiction.

.6 Perform water test as follows:
.1 If water used for flushing or testing is obtained from a potable water supply, the potable water supply is to be continuously separated from the service being flushed or tested by an air gap or a level of protection equal to or greater than that provided by a double check valve backflow prevention device.

.2 Plug all inlet and outlet pipes with watertight plugs.

.3 Fill with water to top of precast sections.

.4 Allow time for initial absorption.

.5 Measure and record volume of water required to maintain level for one hour.

.6 Leakage not to exceed 5.0 litres per hour per 1000mm diameter per 1000mm of height above groundwater.

.7 Locate and repair defects if test fails. Retest using same methodology.

.8 Repair leaks regardless of test results.

- .7 Conduct vacuum testing as follows:
 - .1 Plug all inlet and outlet pipes. Restrain plugs.
 - .2 Place and seal vacuum tester head to the precast section.
 - .3 Draw vacuum of 250mm Hg on the manhole and measure the time for the vacuum to drop to 225mm Hg.
 - .4 Time to be not less than 45, 50, 65, and 80 seconds for manhole diameters of 1050mm, 1200mm, 1500mm, and 1800mm respectively.
 - .5 For manholes deeper than 6 meters, increase test times by 2 seconds per 300mm of additional manhole depth.
 - .6 Locate and repair defects if test fails. Retest using same methodology.
 - .7 Repair leaks regardless of test results.

PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies requirements for constructing asphalt concrete pavement. Work includes fine grading, supply and placing of prime or tack coat, hot mix asphalt concrete, and pavement markings.
- 1.2 Related Sections .1 Concrete: Section 03 30 00
.2 Earthwork: Section 31 20 00
.3 Walks, Curbs and Gutters: Section 32 16 00
.4 Reinstatement: Section 32 98 00
.5 Precast Manholes, Catch Basins and Structures: Section 33 39 00
.6 Standard Details: Section 39 00 00
- 1.3 Reference Standards .1 CAN/CGSB 1-74-2001, Alkyd Traffic Paint.
.2 Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance.
.3 Transportation Association of Canada: Manual of Uniform Traffic Control Devices for Canada.
- 1.4 PGAB Escalation/De-Escalation .1 If specified in Project Documents an asphalt index mechanism in accordance with the Nova Scotia Transportation Infrastructure and Renewal program shall be applicable to the Work.

PART 2 - PRODUCTS

- 2.1 Materials .1 Asphalt materials: Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance.
.2 Paint for pavement marking: to CAN/CGSB 1-GP-74M.

- .3 Recycled engine oil binders (REOB) are not accepted in any PGAB to be used on streets and roads. Provide the Engineer with certification that the PGAB supplied does not contain REOBs.

2.2 Asphalt Concrete

- .1 Asphalt concrete mix: to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 4, and type indicated in the Project Documents.

PART 3 - EXECUTION

3.1 Fine Grading

- .1 Fine grade gravel surface to within 10mm of elevations and cross sections indicated immediately prior to placement of asphalt materials. Add or remove gravel as required. Compact to 100% Standard Proctor Density or as directed by the Engineer.

3.2 Adjusting Tops of Castings

- .1 Prior to placing asphalt surface course:
 - .1 Adjust manhole covers and catch basin frames to match asphalt surface, using manufactured or cast-in-place grade rings.
 - .2 Adjust valve boxes to finished asphalt surface. Raise or lower top sections of valve boxes.

3.3 Prime Coat

- .1 When specified by the Project Documents, apply prime coat to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 5.

3.4 Tack Coat

- .1 Apply tack coat on existing asphalt concrete to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 1. Apply tack coat to contact surface of curbs, castings and structures.

3.5 Paving

- .1 Transport, place and compact asphalt concrete mix to Nova Scotia Transportation and Infrastructure Renewal Standard Specification -

Highway Construction and Maintenance. Construct pavement within specified tolerances to lines, elevations, cross sections and dimensions at locations indicated.

- .2 Thickness of asphalt courses not to vary more than 6mm from thickness indicated, with average thickness as indicated.
- .3 Finished asphalt surfaces to be within 6mm of design elevation, but not uniformly high or low. Finished asphalt surface not to have irregularities exceeding 6mm when checked with a 3 metre straightedge placed in any direction.

3.6 Pavement Markings

- .1 Apply temporary markings prior to removal of temporary traffic control.
- .2 Surface to be dry and clean prior to application of permanent markings. Apply paint at application rate indicated with spray gun to lines and at locations indicated. Dimensions and colour to Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada, Part C.

PART 1 - GENERAL

<u>1.1 Work Included</u>	.1	This section specifies requirements for reinstatement of surfaces, property, and structures damaged or disturbed by operations under this Contract. Work includes but is not limited to reinstatement of paved, gravelled and grassed surfaces; sidewalks, curbs and gutters; and ditches and culverts.	
<u>1.2 Related Sections</u>	.1	Concrete	Section 03 30 00
	.2	Metal Fabrications	Section 05 50 00
	.3	Earthwork	Section 31 20 00
	.4	Asphalt Concrete Paving	Section 32 12 16
	.5	Walks, Curbs and Gutters	Section 32 16 00
	.6	Trees, Shrubs and Groundcover:	Section 32 90 00
	.7	Topsoiling and Finish Grading	Section 32 91 19
	.8	Seeding and Sodding	Section 32 92 00
	.9	Water Mains	Section 33 11 00
	.10	Sanitary Sewers	Section 33 31 00
	.11	Pressure Sewers	Section 33 34 00
	.12	Precast Manholes, Catch Basins and Structures	Section 33 39 00
	.13	Storm Sewers and Culverts	Section 33 40 00
	.14	Standard Details	Section 39 00 00
<u>1.3 Reference Standards</u>	.1	Nova Scotia Transportation and Infrastructure Renewal Specification - Highway Construction and Maintenance.	

- .2 Canadian Landscape Standards 2016 (CLS) Section 2 General Requirements 2.1.22 ACCEPTANCE.

PART 2 - PRODUCTS

2.1 Materials

- .1 Gravels: to Section 31 20 00.
- .2 Asphalt Concrete Materials: to Nova Scotia Transportation and Infrastructure Renewal Specification, Division 4, Section 4 - Highway Construction and Maintenance.
- .3 Concrete Materials: to Section 03 30 00.
- .4 Culverts: to Section 33 40 00.
- .5 Topsoiling and Finish Grading: to Section 32 91 19.
- .6 Seeding and Sodding: to Section 32 92 00.
- .7 Trees, Shrubs and Groundcover: to Section 32 90 00.

2.2 Mixes

- .1 Asphalt Concrete:
 - .1 Roads: to Section 32 12 16
 - .2 Walks and Curbs: to Section 32 16 00
- .2 Portland cement concrete: to Section 03 30 00.

PART 3 - EXECUTION

3.1 General

- .1 Reinstate all surfaces to lines, elevations and dimensions which existed prior to construction and to match abutting surfaces.
- .2 Make good all damage or disturbances to surfaces, survey markers, properties and structures disturbed during construction.

3.2 Gravel Surfaces

- .1 Place, spread, and fine grade to minimum compacted thickness of 150mm for shoulders and other gravel surfaces. Compact to 100% Standard Proctor Density.

3.3 Asphalt_
Concrete Surfaces

- .1 Make vertical saw cut to full depth of asphalt concrete in straight lines. Cut back 300mm minimum from edge of excavation or beyond to eliminate tension cracks.
- .2 Place or remove gravel to depth indicated.
- .3 Shape, fine grade and compact gravel surface to 100 percent Standard Proctor Density.
- .4 Clean contact surfaces and apply tack coat prior to placing asphalt concrete.
- .5 Place and compact hot-mix, hot-placed asphalt concrete to Section 32 12 16, and to the following minimum thickness or as indicated in the Project Documents:
 - .1 Sidewalk: 50mm
 - .2 Other Surfaces: 75mm

3.4 Asphalt_
Concrete Curbs

- .1 Cut back existing curb to full cross section, clean asphalt concrete contact surfaces and apply tack coat prior to placing asphalt concrete curb.
- .2 Place hot-mix, hot-placed asphalt concrete to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance. Use curb machine having mould dimensions equal to those of the existing asphalt concrete curb. Hand placing not permitted unless approved by Engineer.

3.5 Concrete Walks,
Curbs and Gutters

- .1 Construct concrete walks, curbs and gutters to Section 32 16 00.
- .2 Terminate reinstatement at nearest existing control joint or as directed.

3.6 Landscaped_
Surfaces

- .1 Fine grade to smooth surface all areas to be reinstated.
- .2 Reinstate landscaped surfaces to Sections 32 91 19, 32 92 00 and 32 90 00.

3.7 Ditches

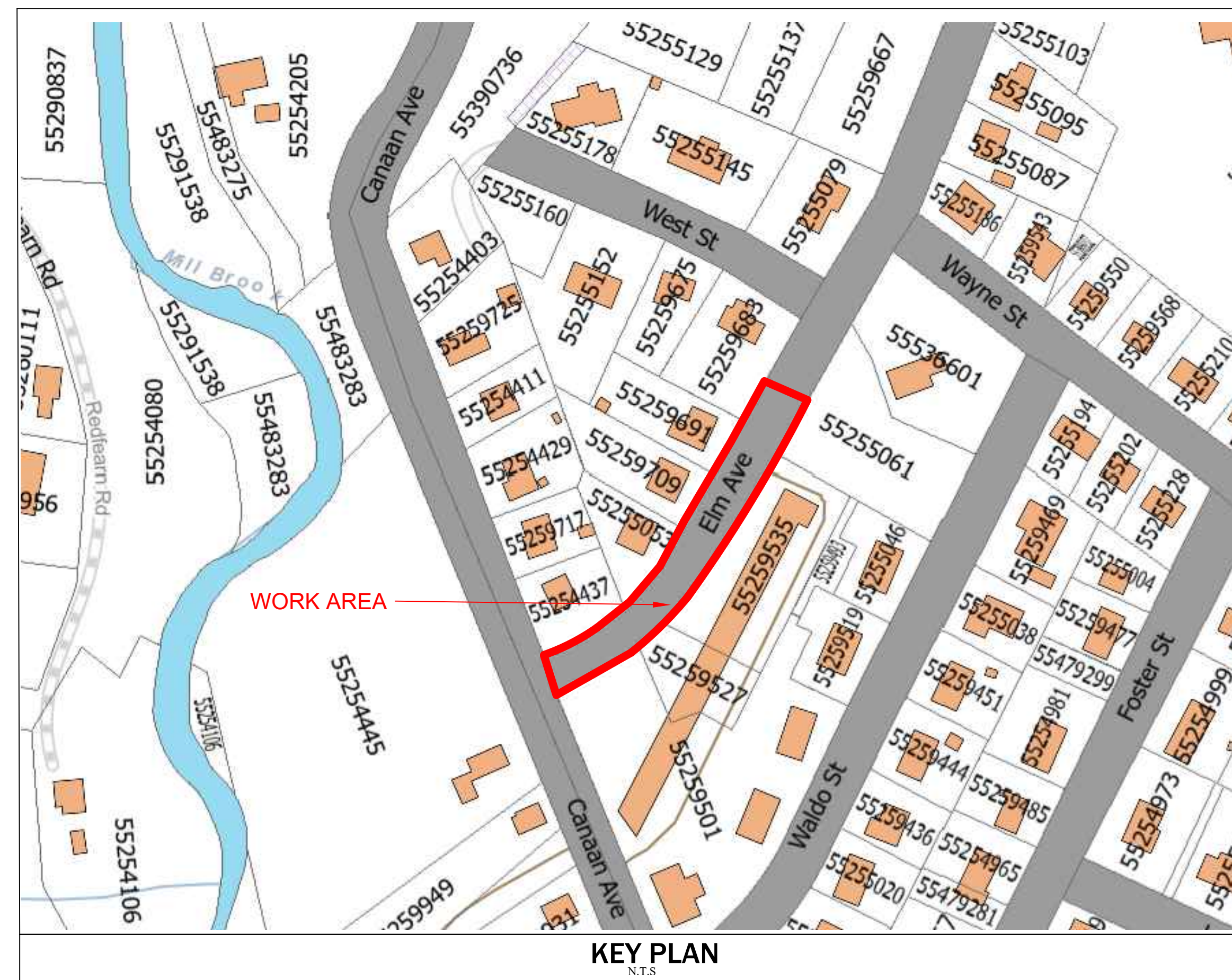
- .1 Re-establish ditches to provide drainage that existed prior to construction.

3.8 Culverts .1 Repair or replace all damaged culverts with new culvert of same or approved material and to original lines, elevations, and dimensions.

TOK 2024-09 SANITARY SEWER REHABILITATION ELM AVENUE

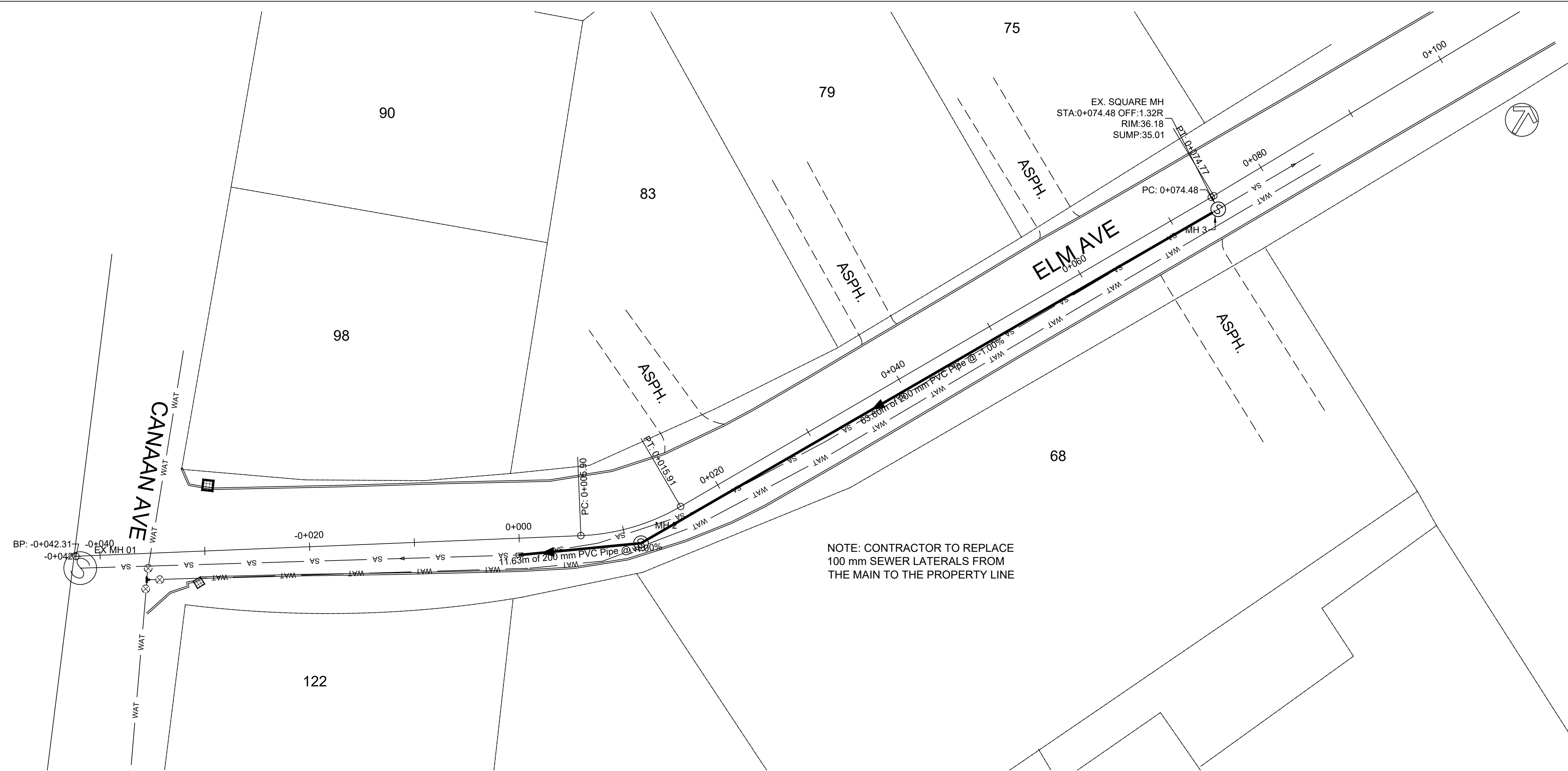
Kentville

TOWN OF KENTVILLE



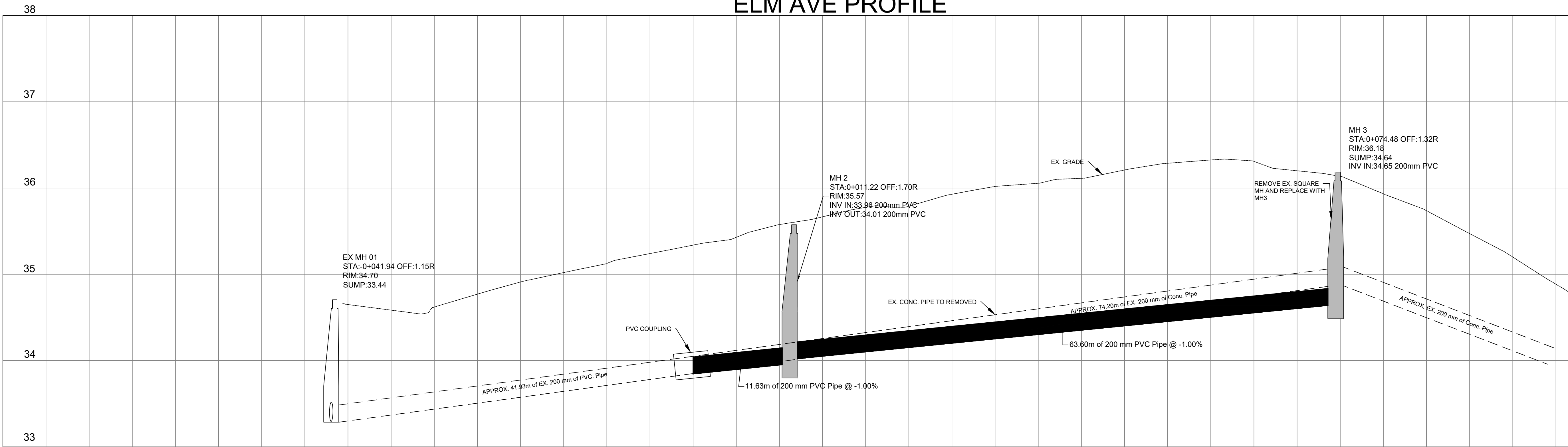
INDEX TO DRAWING	
SHEET No:	DESCRIPTION
	COVER SHEET
1	SANITARY REPLACEMENT PLAN AND PROFILE
2	DETAILS

ATTENTION:
CONTRACTOR IS RESPONSIBLE FOR
THE EXACT LOCATION AND
PROTECTION OF EXISTING UTILITIES
DURING CONSTRUCTION.

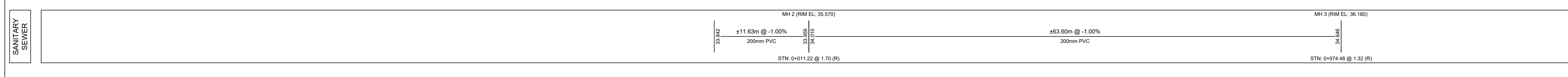


NOTE: CONTRACTOR TO REPLACE 100 mm SEWER LATERALS FROM THE MAIN TO THE PROPERTY LINE

ELM AVE PROFILE

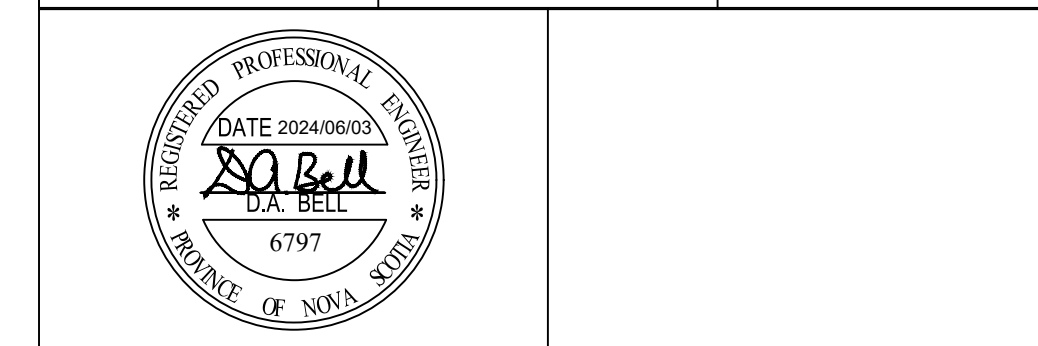


Data	34.65 34.649	34.91 34.911	35.34 35.338	35.78 35.776	36.06 36.055	36.33 36.325	35.93 35.933	34.88 34.885	
	-0+060	-0+040	-0+020	0+000	0+020	0+040	0+060	0+080	0+100



- Notes
- THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
 - STANDARD & SUPPLEMENTAL SPECIFICATIONS FOR MUNICIPAL SERVICES (NSCEA & NSRBA)
 - EROSION & SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION SITES (NSE)
 - SEPARATION DISTANCES, AS OUTLINED IN THE POLICY ON INSTALLATION OF GRAVITY SEWERS, SEWAGE FORCEMAINS AND WATERMAINS IN COMBINED AND SEPARATE TRENCHES (NSE)
 - ALL ELEVATIONS ARE IN METRES TO CANADIAN GEODETIC DATUM USING NSHPN No. 208278
 - UNDERGROUND AND OVERHEAD SERVICES SUCH AS WATER, SEWER, DRAINS, TELEPHONE, ETC., SHOWN ON PLANS ARE APPROXIMATE ONLY.
 - THE OWNER OF EXISTING SERVICES IN THE WORK AREA MUST BE NOTIFIED BY THE CONTRACTOR AT LEAST ONE (1) WEEK BEFORE WORK COMMENCES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH THE WORK AREA, AND ALL EXISTING SERVICES, WHETHER SHOWN ON THE ENGINEER'S PLANS OR NOT, BEFORE EXCAVATING.
 - THE CONTRACTOR IS ALSO RESPONSIBLE FOR THE SERVICES AND MAINTAINING ALL EXISTING SERVICES AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
 - REMOVE AND REPLACE EXISTING MAILBOXES, FENCES AND SIGNS WHERE NECESSARY, AS DIRECTED BY THE CONSULTANT.
 - REINSTATE EXISTING DRIVEWAYS, DITCHES, LAWNS AND ASPHALT SURFACES DAMAGED OR DISTURBED DURING CONSTRUCTION AND REPLACE EXISTING DRIVEWAY CULVERTS IF DISTURBED OR DAMAGED TO THE APPROVAL OF THE CONSULTANT, IN ACCORDANCE WITH THE REQUIREMENTS OF THE NOVA SCOTIA DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS.
 - THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF 450mm CLEARANCE BETWEEN WATER MAINS AND ANY INTERSECTING SANITARY OR STORM LINES.
 - THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING MANHOLES AND STRUCTURES. ANY ABANDONED STRUCTURES LEFT IN PLACE TO BE CUT OFF 600mm BELOW GRADE & FILLED WITH NON-FILL (LEAN CONCRETE).

LEGEND		
EXISTING		PROPOSED
— SA —	SANITARY PIPE	—
⊙	SANITARY MANHOLE	⊙
— WAT —	WATER PIPE	---
⊗	VALVE	⊗
⊠	CATCH BASIN	⊠
▷	DIRECTION OF FLOW	▷
⊙	HYDRANT	⊙
↓	CAPPED OR PLUGGED	↓



No.	MM/DD/YYYY	Revision Description	By
1	06/03/2024	ISSUED FOR TENDER	AEK



TOWN OF KENTVILLE
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

Horizontal 1:250	Vertical 1:25	Plot ARCH D (24"x36")
Project SANITARY REHABILITATION ON ELM AVE.		
Title SANITARY REPLACEMENT PLAN AND PROFILE FROM STA -0+042.31 TO 0+074.77 KENTVILLE, NOVA SCOTIA		
Tender No. 2024-09	Account No.	
Issued For Tender Date:	Issued For Construction Date:	As Construction Date:
Project No. 2024-09	Drawn AEK	Sheet 1 of 2
Ref. 2024 CAPITAL	Engineer DAB	Drawing No. C101
Date MAY 01-2024	Check DAB	

2024-09-01 10:53:23 AM EST DAB:AEK:10/24/24

