HARBOURVIEW SEWER REDIRECTION

TOWN OF STRATFORD, PEI

TENDER DOCUMENTS
AND SPECIFICATIONS

APRIL 2026

END OF SECTION

HARBOURVIEW SEWER REDIRECTION
STRATFORD UTILITY CORPORATION
TOWN OF STRATFORD

SPECIAL PROVISIONS

April 2026

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1. All correspondence and questions related to this work during tender call shall be directed to WSP, 195 MacEwen Road, Summerside, PE C1N 5Y4 or Phone (902) 436-2669 or email Colin.Maceachern@wsp.com.

2. Unit prices quoted are to include all applicable taxes, excluding HST, which is to be added in the provided space on the Schedule of Unit Prices. FINAL BID PRICE MUST INCLUDE HST.

3. No extra work will be allowed to proceed without the execution of a change order signed by the Stratford Utility Corporation or their representative and the Contractor, specifying work to be conducted and a fixed cost for said work.

4. All mains are to be bedded and backfilled in Type 4 Material, bedding sand to a depth of 300 mm above the top of pipe. All backfill to be compacted to 100% Standard Proctor Density.

5. Bidders are advised that **no** trenches may be left open overnight.

6. It is intention of the Stratford Utility Corporation to reuse as much existing material as possible when backfilling utility trenches. If excavated material is deemed unacceptable by the Engineer, then there will be a requirement to remove excavated material from site and replace this material with good quality sandstone. Sandstone shall be composed of clean, uncoated particles free from lumps of clay or other deleterious materials of which no more than 15% shall pass a 75 um sieve and no material shall be retained on a 100 mm sieve.

   For the purpose of this contract it has been estimated that fifty cubic meters ($50m^3$) of sandstone shall be required for storm line placement. There is a possibility that all or none of the above amount shall be utilized. There shall be no additional payment to the Contractor in either case as a result of quantity requirements. Payment will be full compensation for supply of sandstone and removal of unacceptable materials from the site.

   All sandstone is to be compacted to 100% Standard Proctor Density.

7. In all areas where rock is encountered at or near the invert of the pipe in question, the Contractor will be required to excavate the rock a minimum of 150 mm below the bottom of the new mains and replace material with hand selected material approved by the Engineer, compacted to 100% Standard Proctor. Refer to Section 31 23 33 for method of payment.

8. Bidders are advised that no extras will be allowed for minor grade changes required due to conflicts exposed during excavation.

9. Bidders are advised that **no** mains or services are to be backfilled prior to inspection by the Owner's Representative.

10. All requirements of the Department of Transportation & Infrastructure and Stratford Utility Corporation with regards to street blockage, construction barricades, flagpersons, etc., during construction will be the responsibility of the Contractor from the point of view of contact, coordination and cost.

11. Bidders are advised that a Certificate of Substantial Completion will only be issued following the Contractor successfully completing all required reinstatement and the completion of record drawings.

12. In all areas where pipes cross with less than 300 mm clearance, a formed concrete cradle will be required between the pipes. Minimum horizontal dimensions will be 500 mm x 500 mm, with vertical dimensions being the invert of the lower pipe and the mid-point of the upper pipe.

13. Bidders are advised that due to budgetary restraints, the scope of the project may have to be diminished in total cost in order to meet available funding. The Owner reserves the right to reduce or omit any item as deemed necessary in order to meet budgetary restraints.

14. At all locations where new lines are installed into an existing systems, all repair sleeves, etc., that may be required for a complete finished product to the Engineer's approval are to be incorporated into the work and will be considered incidental to fittings being installed. No extras will be allowed.

15. For the purposes of record drawings, the Contractor will be required to supply red-line mark-up plans to the Engineer at the completion of the project and prior to final inspection (see section 01 78 01). All costs associated with the requirements of the above section are considered incidental to the project. However, no holdback monies will be released until all "Record Drawings" have been accepted by the Engineer and the Stratford Utility Corporation.

16. Bidders are advised that issued project drawings are to be considered as a reasonable reflection of existing surface conditions only, and that underground conditions will vary and that non-detected or unforeseen items are to be expected (ie., unexpected buried pipes, excessive groundwater or rock, utilities lines, etc.). If existing conditions vary in such a manner as to severely impede progress or cause a complete halt to construction activities, notify the Site Engineer immediately for further direction.

If it is deemed by the Site Engineer that alterations to existing features or revisions to the design are required, then the appropriate direction will be given to the Contractor and the required Change Orders are to be signed. The above process is expected to be completed within a time period of 48 hours, per occurrence, after notification to the Site Engineer (excluding weekends). The Contractor will be required to continue construction activities in other areas of the project site, so as to minimize the amount of down time. Costs related to down time will not be considered as an extra to the project under any circumstances. If construction activity is legitimately delayed, the Contractor's construction schedule will be extended to reflect the appropriate time.

17. The Contractor is required to locate water and sewer services, prior to any construction. The Contractor will be required to use extreme care when excavating around existing services. Intentional breaking will not be permitted. All services which are damaged are to be repaired by the Contractor at the Contractor's expense. No extras will be allowed.

18. a) The Tenderer shall fill in their own schedule showing the number of weeks of construction activity planned. Tenderers are advised that upon receipt of tenders and construction activity time, the authority will estimate construction costs for each Tenderer's submission dates. The completion of tenders submitted, plus estimated owner's construction costs, based on the Tenderer's completion time, will be considered in the award of tender. Construction costs for the purpose of evaluation only will be $5,000.00 per week.

b) Extension of Time - An extension of time may be granted in writing by the Owner in the event of the work being delayed due to a change of scope in the work, a significant unit quantity increase, loss of production due to above average weather conditions, delays in material supplied by others and any other causes beyond the Contractor's control. Such extensions shall be for such time as the Owner may prescribe, and the Owner shall fix the terms on which the said extension may be granted. An application by the Contractor for an extension of time as herein provided shall be made to the Owner in writing prior to the end of the specified contract time. Where applicable, all bonds or other surety furnished to the Owner by the Contractor shall be amended where necessary at the expense of the Contractor to provide coverage beyond the date of any extension of time granted, and the Contractor shall furnish the Owner with evidence of such amendment of the bonds or other surety.

Any extension of time that may be granted and accepted without prejudice to any rights of the Owner whatsoever under the Contract. All such rights shall continue to be in full force and in effect after the specified construction period.

c) Liquidated Damages - The Contractor shall pay liquidated damages for each working day beyond the number of working days as specified in the Contract or beyond any extension of time that may be granted in accordance with 18(b) above.

The liquidated damages shall be equivalent to the costs incurred by the Owner for each day beyond the scheduled time of completion. All above monies shall be deducted from progress claims (ie., consultant fee, supervisor salaries, overhead vehicle cost, etc.).

19. At all locations where new manholes, catchbasins, sewer mains and storm mains are installed into an existing system, all transition sleeves, repair sleeves, jackhammering, grouting, etc., that may be required for a complete finished product to the Engineer's approval are to be incorporated into the work and will be considered incidental to the item being installed. No extra will be allowed.

20. Upon final inspection and testing, if any part of any components that do not meet project specifications, then the following shall occur:

    a) The Contractor shall immediately remove all components that do not meet project specifications and replace them with materials that do meet project specifications at no additional cost to the Owner; or,

    b) The Contractor shall make arrangements with the Owner so as to satisfy the Owner that no short- or long-term negative consequences will occur as a result of the components not meeting specifications. If the Contractor cannot satisfy the Owner of these requirements, then all components that do not meet project specifications shall be removed and replaced by the Contractor at no additional costs to the Owner;

    c) All costs associated with non-compliance with specifications, including testing materials, labour and engineering, will be the Contractor's responsibility.

21. Bidders are advised that the Contractor will be required to repair any trench settlement/heaving which occurs. If the settlement occurs within the limits of the asphalt within the Maintenance Guarantee Period, the Contractor will be required to perform all repairs to the satisfaction of the Engineer and the Stratford Utility Corporation. Also, the 5% Maintenance Guarantee, or portion thereof, will be held for one additional year after repairs have been made.

22. Bidders are advised that all curb stops, valves, manholes, catch basins, etc. that are within the project limits must be adjusted where required to be flush with the surface and accessible upon completion of the work. The Contractor will be responsible for all components necessary to make the adjustment. This is considered incidental to the work and no extra will be allowed.

23. Bidders are advised that the Contractor will be responsible for maintaining all property pins and for identifying all property pins that may be required to be removed during construction. The Contractor must have the property owner locate pins that may not be visible and keep records identifying what pins have been located, not been located, and require to be removed. This information must be completed and submitted to the Stratford

Utility Corporation prior to commencement of construction. Any pins removed must be replaced by a Land Surveyor at the Contractor's expense.

24. Bidders are advised that plans for the project have been submitted to Maritime Electric Company Ltd. (MECL), Bell Aliant Ltd. and Eastlink. Bidders are advised to contact the following representatives with respect to the individual utility's infrastructure and requirements:

Utility	Contact Name	Telephone #
MECL	Mech\group-undergroundlocates @maritimeelectric.com	1-800-670-1012
Bell Aliant		
- Ch'town → East	Kyle Jordan Kyle.Jordan@bellaliant.ca	
	If required to survey, use Info Excavation	*1-800-663-9228*
Eastlink	Ontario.locates@corp.eastlink.ca	

25. The Contractor will be required to coordinate with the Department of Transportation, Infrastructure and Energy and Stratford Utility Corporation to facilitate the relocation of any signage impacted by the placement of the gravity main. All relocations are to be considered incidental to the placement of the gravity main. No extras will be allowed.

26. Bidders are advised that all manhole locations are considered as approximate only. Final locations are to be determined on site jointly by the Owner's Representative and contractor. No extras will be allowed as a result of minor site changes.

27. Materials testing will be the responsibility of the Contractor and must be performed in accordance with Section 01 45 00 of the project specifications.

28. All work is to be carried out within the right-of-way. Absolutely no activity will be permitted on private property unless written consent is received from the Owner.

29. The Contractor will be required to conform to the Provincial Department of Transportation and Infrastructure "Environment Protection Plan" (EPP) document throughout the course of the work. The Contractor will be required to follow all items included in the above document in the course of the work.

30. Bidders are advised that any pumping of silt laden water from the trench, or bypass pumping of sewage, or dewatering will be subject to all environmental agency regulations. A contained area to receive and filter pumping discharge will be the Contractor's responsibility with respect to location, type, approval and maintenance. No extra will be allowed for any costs associated with this item.

31. The Contractor will become the owner of all excavated material that is considered excess (ie., topsoil, common borrow) or unsuitable for construction. All material that is considered excess or unsuitable for construction is to be hauled off site, at the Contractor's expense.

32. During placement of the new line, the Contractor will be required to work in close proximity to trees, shrubs, hedges, etc. All work is to be done in accordance to Section 32 91 10, no extra will be allowed for this item.

33. Bidders are advised that the Contractor must employ and pay for the services of a Prince Edward Island Land Surveyor to provide project layout and record drawings (See Section 01 78 01). All costs associated with the requirements of the above section are considered incidental to the project; however, no holdback monies will be released until all "Record Drawings" have been received and accepted by the Engineer and the Owner.

34. Domestic water mains, water services and sewer services will be encountered during the sewer main installation for the entire project. These lines (both mains and services) are not to be willingly broken and repaired. Every effort must be made to locate and protect all active water and sewer lines and services. All lines are to be located either by excavation or by water detector equipment prior to commencing sewer main installation. Any breaks of any portion of the water distribution system and/or sewer system must be repaired by the Contractor at the Contractor's expense, and to the Engineer's approval. No extras will be allowed.

35. The Owner has applied to the PEI Department of Environment, Energy and Climate Action for a "Permit to Construct" for the project. Any changes required in the Approval will be incorporated into the project work. No work will be allowed to proceed until a Certificate of Approval has been received.

36. Bidders are advised that if wet conditions are encountered in the trench excavation, it may be deemed necessary by the Engineer to use drainage gravel (including filter fabric) as bedding material rather than sand material as specified and shown in the details. For the purpose of this contract, it has been estimated that twenty-five cubic meters (25 m^3) of drainage gravel will be required. There is a possibility that all or none of this quantity will be utilized. There shall be no additional payment to the Contractor in either case as a result of quantity requirements. Per cubic meter payment will be full compensation for supply and placement of drainage gravel (including filter fabric) in accordance with Section 31 23 33.

37. Bidders are advised that all storm infrastructure labelled as "To be Removed & Replaced" is to be replaced with **new** dual wall HDPE storm pipe.

38. All grassed areas disturbed during construction shall be reinstated with 100mm topsoil and sod as per section 32 92 23 – Topsoiling, Seeding and Sodding. All costs related to reinstating grassed areas disturbed are to be considered and included in the respective line items in the Schedule of Unit Prices.

39. Bidders are advised that for the purpose of record drawings, swing ties shall be provided as required by the Stratford Utility Corporation Municipal Servicing Standards for underground infrastructure including, but not limited to, valves, stub lines, manholes, bends, tees, noted repairs to existing infrastructure and anything encountered on site which was not shown on design drawings.

40. Bidders are advised, asphalt road cutting and resurfacing quantity presented in the Schedule of Unit Prices is based off a theoretical trench width of 1.5 m for the length of main beneath the asphalt. Bidders must consider and include in the unit price supplied for asphalt road cutting and resurfacing any additional quantity which may be needed for manhole installations, service reconnections, temporary reconnection of main, etc., for a complete finished product based on specific construction technique.

41. Bidders are advised, prior to application for substantial completion, the Contractor is required to furnish the Engineer with the complete certified materials testing and geotechnical report.

42. Bidders are advised, the Contractor is required to perform CCTV video inspection prior to construction to confirm the location / size of existing services between existing LS #1 and existing MH #3. All costs associated with the pre-construction CCTV inspection are considered incidental to the work and shall be considered and included in the per (ea) price submitted for Sewer Service Reconnections.

43. Bidders are advised, the Contractor is required to advise residents at minimum 12 hours in advance of any potential interruption to the resident’s water or sewer service.

1 GENERAL

Sealed tenders for the work proposed shall be addressed to the Stratford Utility Corporation and plainly marked:

Harbourview Sewer Redirection
Stratford Utility Corporation
Stratford, PEI

Tenders will be received by the Stratford Utility Corporation until the date and time specified in in the tender ad, at the Town Office located at 234 Shakespeare Drive, Stratford, PEI.

2 GOVERNING LAW

Federal and Provincial laws shall govern the interpretation and performance of any agreement with the Stratford Utility Corporation regarding this project. Any action brought to enforce any provision of an agreement shall be brought in the appropriate courts of the Province of Prince Edward Island. The parties understand and expressly agree that any claims, demands or actions asserted against the Stratford Utility Corporation, its Agents and Employees shall be brought only in the court system of the Province of Prince Edward Island.

3 TENDER DEPOSIT

Every Tender received shall be accompanied by a certified cheque, bank draft or bid bond payable to the Stratford Utility Corporation in the amount of at least Ten Percent (10%) of the tender price, including all applicable taxes. The bid guarantees will be returned to all, except the three lowest bidders, within three days after the opening of tenders. The bid guarantees of the remaining non-successful bidders will be returned within the earlier of 60 days after the opening of tenders and two days after Council awarding the tender. No interest will be paid on any tender deposit.

If a bid bond is issued it must be accompanied by a letter of surety from a recognized Canadian Surety Company outlining that a Fifty Percent (50%) Performance Bond and a Fifty Percent (50%) Labour and Materials Bond will be presented if awarded the project.

All other deposits shall be returned by mail unless otherwise requested by the Bidder.

4 INTERPRETATION OF CONTRACT DOCUMENTS

Should any person contemplating submitting a tender for the proposed Contract find discrepancies in or omissions from the drawings, specifications, or other parts of the contract documents, or should they be in doubt as to their true meaning, or if they require additional information concerning the scope of work or the manner in which it must be carried out, he/she may submit a written request to the Engineer for interpretation a minimum of two clear business days prior to tender closing. Any conflict between drawings, specifications and authoritative requirements, the most stringent interpretation will apply.

These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract.

5 WITHDRAWAL OR QUALIFYING OF TENDERS

A Bidder who has already submitted a tender may submit a further tender at any time up to the official closing time. The last tender received shall supersede and invalidate all tenders previously submitted by that Bidder for this Contract. Any Bidder may withdraw or qualify their tender at any time up to the official closing time by submitting a letter bearing his/her signature and seal as in their tender to the Owner the time and date of receipt will be marked thereon and the letter will be placed in the tender box. The new tender shall be marked on the sealed envelope by the Bidder as "Resubmission #" along with the name of the Bidder and to the attention of the Controller. Tenders may be withdrawn at any time prior to opening upon written request from the Bidder. Negligence on the part of the Bidder in preparing his/her tender shall not constitute a right to withdraw a tender subsequent to the tender opening.

No fax or email submission will be considered. All entries in the Form of Tender shall be made in ink or by typewriter. Entries and changes made in pencil shall, unless otherwise decided by the Owner, be invalid or informal.

6 INFORMAL OR UNBALANCED TENDERS

Tenders that contain prices which appear to be so unbalanced as likely to affect adversely the interests of the Owner may be rejected. Wherever, in a tender that amount tendered for an item does not agree with the extension of the estimated quantity and the tendered unit price, the unit price shall govern and the amount shall be corrected accordingly. If a Bidder has not entered a price for an item or work set out in the Form of Tender, he/she shall, unless it was specifically stated otherwise in their tender, be deemed to have allowed

elsewhere in the Form of Tender for the cost of carrying out the said item or work, unless agreed by the Owner no increase shall be made in the Total Tender Price on account of such omission.

7 EXAMINATION OF SITE

Each Bidder shall personally examine the location of the proposed work, and shall satisfy themselves by such other means as they may prefer as to the actual conditions and requirements under which the work shall be carried out.

No plea for ignorance of conditions that exist or that may hereafter exist or of conditions or difficulties that may be encountered in the execution of the work under this Contract as a result of failure to make the necessary examinations and investigations shall be accepted as an excuse for any failure or omission on the part of the Contractor to fulfil in every detail all the requirements of said Contract Documents or shall be accepted as a basis for any claim whatsoever for extra compensation or an extension of time.

The Bidder shall also make all the investigations necessary to thoroughly inform themself regarding all facilities for access to the site that they may require for storage and construction operation.

8 TENDER FORM

All submissions shall be upon the blank Form of Tender enclosed and be signed by the Bidder with their business address and place of residence. All blank spaces which pertain to the Tender submitted shall be filled in by typewriter, or legible printing in ink except signatures, which must be handwritten.

9 PRICE SUBMITTED

The amounts stated in the Tender Form shall include the furnishing of all materials, supplies and equipment and the providing of all labour, construction tools and equipment, utility and transportation services necessary to complete all the work required under this Contract whether specifically included in the Contract Documents or not. It is the intention of the Drawings and Specifications to provide finished work. Any items omitted therefrom which are clearly necessary for the completion of the work or its appurtenances shall be considered a portion of the work though not directly and/or shown or called for on the Drawings.

10 SUB-CONTRACTORS

The Bidders shall give in the Form of Tender the name and address of each proposed sub-contractor used in making up his tender as set out in the Tender Form. Only one sub-contractor shall be named for each part of the work to be sublet. The Stratford Utility Corporation reserves the right to accept or reject sub-contractors.

11 RIGHT TO ACCEPT OR REJECT TENDERS

Bidders are advised that:

The lowest or any particular bid will not necessarily be accepted.

The criteria to be considered by the Owner in awarding the contract will include a combination of price, scheduling, expertise, qualifications and such other conditions as may be determined by the Owner to be in its own best interests.

Additions, alterations, deletions or other irregularities in the bid form may, but will not necessarily, result in the Owner's rejection of the bid.

The bidder acknowledges that it shall have no claim against, or entitlement to damages from, the owner by reason of the Owner's rejection of its bid or of all bids.

12 CANCELLATION OF TENDER

The Owner reserves the right to cancel any request for tender at any time, without recourse by the Contractor. The Owner has the right to not award this work for any reason, including choosing to complete the work with the Owner’s [sic] own forces**.**

13 CONTRACT DEPOSITS

The Contractor must provide the following performance deposit: Certified cheque(s), or bank draft payable to the Stratford Utility Corporation in the amount of Ten Percent (10%) of the contract price, including applicable taxes, or a Performance Bond **and** a Materials and Labour Bond both in the amount of Fifty Percent (50%) of the contract price payable to the Stratford Utility Corporation. Deposit(s) shall be retained during the contract period until the issuance of the Final Certificate of Completion. Certified cheques and bank drafts will be held, uncashed, by the Owner and no interest will be paid. Performance deposit will be released upon Final Completion of the work to the Engineer's approval. A Fifteen Percent (15%) Holdback will be retained during construction and for Sixty (60) days following substantial completion as the Owner's protection during the standard lien period.

14 SCHEDULE

A detailed schedule of the work must be provided with the tender package and will be reviewed in conjunction to the tendered price and completion time during tender evaluation.

15 SALES TAX

Contractor is to include all applicable Harmonized Sales Taxes (HST). It is the intention of the Owner to claim a credit for these taxes. Therefore, all information pertaining to taxes required by the Owner will be made available by the Contractor.

The HST shall be shown separately in the Schedule of Unit Prices in the provided space. This amount must be added to the subtotal to result in a total tender amount.

16 GUARANTEED MAINTENANCE PERIOD

A guaranteed maintenance period shall be effective for a total of twelve months, specified from the day following substantial performance of the work. Five percent (5%) of all monies shall be retained by the Owner during construction and for twelve (12) months following substantial performance of the work. This five percent (5%) shall be retained as security for the Owner to be utilized by the Owner if the Contractor fails to provide adequate service during the maintenance period. All engineering costs incurred by the Owner resulting from inadequate service by the Contractor (ie., non-responsive to deficient items requiring repair or repeated repairs to the same item), will be deducted from the Guaranteed Maintenance Holdback.

NOTE: Guaranteed Maintenance Holdback is in addition to the Fifteen Percent (15%) Mechanic's Lien Holdback.

17 ASSIGNMENT

This tender, and any resulting contract, may not be assigned by either party without the prior written consent and approval of the other party, which consent may not be unreasonably withheld; provided, however, either party, without such consent, may assign or sell the same in connection with the transfer or sale of substantially its entire business to which this contract pertains or in the event of its merger or consolidation with another company. Any permitted assignee shall assume all obligations of its assignor under this contract. No assignment shall relive any part of responsibility for the performance of any accrued obligation that such party then has hereunder.

18 ADDENDA

1. The Stratford Utility Corporation reserves the right at any time prior to the award of the Contract, to make changes and/or revisions that are considered altering the intent of this Tender. Any changes and/or revisions will be issued as an Addendum.

2. The Stratford Utility Corporation, in consultation with the Consultant, will review all questions and issue written instructions in the form of an Addendum, which will become part of the Contract documents. All Addenda must be acknowledged on the Form of Tender.

3. The closing date of the Request for Tender may be extended as deemed appropriate by the Stratford Utility Corporation.

4. It is a Bidder's sole responsibility to ensure that it has accounted for all Addenda or other notices of change or alteration of the Tender in their submission and in any price proposed therein. All Addenda will be posted at:

   https://www.princeedwardisland.ca/en/tenders and at
   www.townofstratford.ca

5. The Stratford Utility Corporation shall not be liable for any expense, cost, loss or damage incurred or suffered by any Bidder as a result of the publication of an Addendum or other notice.

TENDER FORM FOR

HARBOURVIEW SEWER REDIRECTION

STRATFORD UTILITY CORPORATION
STRATFORD, PEI

TO: STRATFORD UTILITY CORPORATION
ATTENTION: CARTER LIVINGSTONE
234 SHAKESPEARE DRIVE
STRATFORD, PE
C1B 2V8

_____(Name of Tenderer) having carefully examined the site of the proposed works and all documents relating thereto, including the Form of Tender, Instructions to Bidders, General Conditions, Specifications, Drawings, and Addenda if applicable, accept and agree to the same as forming part and parcel of the Contract for the work described in these documents, and we the undersigned hereby tender and offer, in accordance with the said documents, to enter into a Contract with the Stratford Utility Corporation, defined as the Owner, within the time prescribed, to furnish all materials, labour, equipment, matters and things, and to do all work necessary to construct, complete and ready for use within the time stated, in strict accordance with the documents pertaining to the said Contract for the total sum of _____

_____ Dollars ($_____)

or such other sum as may be ascertained in accordance with the Contract. The aforesaid sum is made up as stated in appended Tender Price Breakdown forming part of this Tender and includes all costs, including but not limited to, Harmonized Sales Tax on materials to be incorporated into the work.

WE ENCLOSE HEREWITH: A deposit of Ten Percent (10%) of the tendered amount, including Harmonized Sales Tax, in the form of a certified cheque or bid bond issued by a Company licensed to carry on such business in Canada.

In the event of this tender being accepted within 60 days of the time stated for the closing of receipt of tenders, and our failing or declining to enter into a contract in the form hereinafter mentioned for the amount of our tender, the said security may be forfeited in lieu of damages to which the Owner may be entitled by reason of our failure or refusal to enter into a contract.

IN SUBMITTING THIS TENDER, we recognize the right to the Owner to accept any tender at the prices submitted, or to reject all tenders.

WE SUBMIT HEREWITH a list of trades we propose to execute ourselves:

_____

_____

_____

WE SUBMIT HEREWITH a list of sub-contractors we propose to use on this contract, reserving to us, however, the right to substitute other sub-contractors for any trades in the event of any sub-contractor withdrawing their tender or becoming bankrupt after the date hereof. Any such substitution shall be subject to the approval of the Owner.

_____

_____

_____

IF WE ARE NOTIFIED OF THE ACCEPTANCE OF THIS TENDER WITHIN THE TIME ABOVE SPECIFIED, WE WILL:

a) Execute the most recent edition of the "Standard Construction Document" CCDC-4 (Unit Price Contract).

b) Furnish a Ten Percent (10%) Certified Cheque as Performance Deposit or a Fifty Percent (50%) Performance Bond and a Fifty Percent (50%) Labour and Materials Bond.

c) Commence work on the _____ day of _____, 20___ and complete the entire work included in the contract on or before the _____ day of _____, 20___ resulting in a total number of construction weeks of _____.

Yours truly,

_____ _____

Name (printed) Signature

_____ _____

Name (printed) Signature

_____

(Affix Corporate Seal)

SCHEDULE OF UNIT PRICES
HARBOURVIEW SEWER REDIRECTION
STRATFORD UTILITY CORPORATION
STRATFORD, PEI

Item #	Description	Section	Quantity	Unit Price	Total
1	Sewer Main: PVC DR35 gasketted joints, supplied and installed, including excavation, backfilling, bypass pumping, compaction, shoring, connection to existing lift station, testing, landscaping and dewatering as required. etc.	Section 33 30 00 Part 1.3.1			
	- 200mm dia.		64 m	$	$
2	Manholes: Supplied and installed c/w XSEAL (or approved equal), HyperFlex (or approved equal), hydrophilic, expanding butyl rubber, waterproof membrane, precast bases, frame & covers, excavation, backfilling, compaction, shoring, testing and dewatering as required.	Section 33 05 16 Part 1.3.1			
	- 1050mm dia.		5 m	$	$
3	Manhole Demolition, including excavation, backfilling, capping of existing sanitary lines, surface reinstatement.	Section 33 05 16 Part 1.3.3	1 ea	$	$
4	Harbourview Lift Station Removal: Including, but not limited to, reinstatement of disturbed grassed areas with 100mm topsoil and sod, capping of existing force main noted, and full removal and disposal/turnover of: - Wet Well - Duplex Pump Set - All Interior Piping - Venting - Contols - Electrical Panels - Panel Supports - Electrical Service, including conductor and riser conduit	Section 33 05 16 Part 1.3.2	1 LS	$	$
5	Concrete Curb Removal and Replacement: Supplied and installed including but not limited to, materials, labor, saw cutting, removal and disposal of existing curb, new curb placement, etc.	Section 03 30 00 Part 1.2.1	5 m	$	$
6	Sewer Service Reconnection: Supplied and installed completed including but not limited to tees, bends, sleeves, 2.0m PVC DR-35, etc. - 100mm dia.	Section 33 30 00 Part 1.3.3	4 ea	$	$
7	Storm Main Removal and Replacement: supplied and installed, including materials, labour, removal and disposal of existing, etc. - 375 mm dia.	Section 33 40 00 Part 1.4.1	2 m	$	$
8	Asphalt Road Cutting and Resurfacing: Including sawcutting, planing, seal, gravel and select borrow.	Section 31 23 33 Part 1.4.4	60 m²	$	$

Item #	Description	Section	Quantity	Unit Price	Total
9	Temporary Manhole: Supplied, installed and removed, complete including sewage disposal pump for bypass procedures during removal of Harbourview Lift Station and connection of mains.	Section 33 05 16 Part 1.3.4	1 L.S.	$	$
10	Drainage Gravel (Provisional): Supplied and placed as required to control water in trenches, includes supply and placement of filter fabric.	Special Provision Note # 36	25 m³	$	$
11	Sandstone (Provisional): For replacement of unsuitable material during gravity main placement.	Special Provision Note # 6	50 m³	$	$
12	Rock Excavation (Provisional)	Section 31 23 33 Part 1.4.2	10 m³	$	$
13	Cash Allowance (Unforeseens)	Section 01 21 13 Part 1.1.3	1 LS	$ 15,000.00	$ 15,000.00

Subtotal = $ _____

HST (15%) = $ _____

Total Tender Amount = $ _____
(supplied & installed)

Contractor _____

_____

_____

Signature _____

Part 1 - General

1.1 DESCRIPTION OF WORK

.1 The project site is located on Harbourview Drive in the Town of Stratford.

.2 The work involves the installation of approximately 64m of new 200mm dia. gravity main and associated infrastructure and service reconnections.

.3 In addition, the work involves the full removal of the existing Harbourview Drive Lift Station located at STA. 0+020 of the tendered design drawings, as well as the connection of the new sewer main to the existing lift station.

1.2 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each of the following:

.2 Contract Drawings

.3 Specifications

.4 Addenda

.5 Reviewed Shop Drawings

.6 Change Orders

.7 Other Modifications to Contract

.8 Copy of approved Work Schedule

.9 Manufacturers' Installation and Application Instructions.

.10 Copy of OH&S Regulations for P.E.I.

.11 Regulatory Approvals.

1.3 WORK SCHEDULE

.1 Prior to contract award, provide a schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.

.2 Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and Schedule updated by Contractor in conjunction with and to approval of Engineer.

.3 All costs incurred by the Owner as a result of delays and schedule overruns caused by the Contractor and not previously approved will be at the Contractor's expense.

1.4 MEASUREMENT AND PAYMENT

.1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.

1.5 CONTRACTOR’S USE OF SITE

.1 Do not unreasonably encumber site with materials or equipment.

.2 Move stored products or equipment which interfere with operations of Engineer or other contractors.

.3 Obtain and pay for use of additional storage or work areas needed for operations. Ensure these areas are cleaned up and left in a state equal to or better than the existing conditions, when the project is complete.

1.6 CODES AND STANDARDS

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

.2 Meet or exceed requirements of specified standards, codes and referenced documents.

1.7 SETTING OUT WORK

.1 Set grades and lay out work in detail from control points and grades established by the Engineer.

.2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.3 Supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.

.4 Provide devices needed to layout and construct work.

.5 Supply stakes and other survey markers required for laying out work.

1.8 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Inform Engineer of impending installation and obtain their approval for actual location.

.3 Submit field drawings to indicate relative position of various services and equipment when required by Engineer.

1.9 EXISTING SERVICES

.1 Where work involves breaking into, or connecting to existing services, carry out work at times directed by governing authorities.

.2 Before commencing work, establish location and extent of service lines in area of work and notify Engineer of findings.

.3 Submit schedule to and obtain approval from Engineer for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Engineer.

.5 All existing utilities damaged during construction shall be repaired by the Contractor, or the utility Owner, at the Contractor’s expense, and to the satisfaction of the Engineer.

.6 Where watermain or sewermain or stormline is in close proximity to existing electric and telephone poles, these poles must be maintained while construction is proceeding. All costs associated with this work should be incorporated into Contractor's price. No extra will be allowed.

1.10 EXISTING SURFACE CONDITIONS

.1 Where construction may impact any existing surface conditions such as fencing, trees, signs, etc., the Contractor is responsible to replace and/or reinstate to the original condition as approved by the Engineer, at the Contractor's expense.

.2 All equipment shall be properly equipped to not damage asphalt or concrete surfaces during the project. Any damage to existing surfaces will be reinstated to original condition at the Contractor's expense.

.3 All asphalt/concrete surfaces which require excavation are to be sawcut prior to excavation.

1.11 INSPECTION / TAKEOVER PROCEDURES

.1 Prior to application for Certificate of Substantial Completion, carefully inspect the work and ensure it is complete, that major and minor construction deficiencies are complete, defects are corrected. Notify Engineer in writing, of satisfactory completion of the work and request an inspection.

.2 During Engineer's inspection, a list of deficiencies and defects will be tabulated. Correct same at the Contractor's expense.

.3 Upon final inspection and testing, if any part of any component of the project does not meet project specifications, then the following shall occur:

(a) The Contractor shall immediately remove all components that do not meet project specifications and replace them with materials that do meet project specifications at no additional cost to the Owner; or,

(b) The Contractor shall make arrangements with the Owner so as to satisfy the Owner that no short- or long-term negative consequences will occur as a result of the components not meeting specifications. If the Contractor cannot satisfy the Owner of these requirements, then all components that do not meet project specifications shall be removed and replaced by the Contractor at no additional costs to the Owner.

(c) All costs associated with non-compliance with specifications, including testing materials, labour, and engineering will be the Contractor's responsibility.

.4 When the Engineer has deemed the deficiencies and defects have been corrected and it appears requirements of contract have been performed, make application for Certificate of Substantial Completion.

1.12 CLEANING

.1 General:

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti pollution laws.
- .2 Store volatile wastes in covered metal containers and remove from premises daily.
- .3 Prevent accumulation of wastes which create hazardous conditions.
- .4 Provide adequate ventilation during use of volatile or noxious substances.

.2 Materials:

- .1 Use only cleaning materials recommended by manufacturer or surface to be cleaned, and as recommended by cleaning material manufacturer.

.3 Cleaning during Construction:

- .1 On a daily basis maintain premises free from debris and waste material.
- .2 Maintain project site and public properties free from accumulations of waste materials and rubbish.
- .3 Provide on site containers for collection of waste materials and rubbish.
- .4 Remove waste materials and rubbish from site.

.4 Final Cleaning:

- .1 Leave site in clean and neat condition removing all rubbish, excess materials and any items used on site, but designated to remain in the work.

1.13 MATERIALS

.1 All materials to be incorporated into the work will be new and shall comply with the required acceptable materials list unless stated otherwise or agreed to by the Engineer.

1.14 CHANGE ORDERS

.1 No extra will be allowed to proceed without the execution of a Change Order signed by the Owner or the Owner's Representative and the Contractor, specifying the work to be conducted and a fixed cost for said work.

1.15 SITE MAINTENANCE AND CLEAN-UP

.1 The Contractor is advised that extra care must be taken during construction, at the end of every day worked and over weekend or shut-down periods, to maintain dust control and site clean-up. Bidders are advised that the minimum daily clean-up requirements will be that all areas affected will be wet down and hand swept or equivalent method as approved by the Engineer.

.2 As each area is 100% completed, with all mains, services, topsoiling and hydroseeding in place, a complete high-pressure water washing of all affected areas will be required at the Contractor's expense.

.3 These clean-up items will be strictly enforced. No effort or costs will be incurred by the Owner.

1.16 LIMITATION OF OPERATION

.1 Except for such work as may be required to maintain the travelled roadway in a safe and satisfactory condition for traffic and as noted in .2 below, the Contractor shall not carry out operations under the contract between a ½ hour before sunset and a ½ hour after sunrise, or from 7:00 am to 7:00 pm on any working day, or at any time on Saturday, Sunday, Thanksgiving Day or statutory holidays and in accordance with the Town of Stratford Noise & Nuisance By-law. The most stringent will apply. This includes the start-up and moving of equipment on the site as well as at the marshaling yard.

.2 The Engineer may require the Contractor to work on Saturdays, Sundays or statutory holidays to assure the safety of the travelling public. In addition, the Engineer may require the Contractor to work on Saturdays in order to complete the work.

.3 The Engineer may in writing require the Contractor to cease or limit operations under the Contract, or any working day or days, if the operations are of such nature, or if the work is so located, or if the traffic is of such volume that the Engineer deems it necessary or expedient to do so.

1.17 ASSISTANCE TO THE CONSULTANT AND CONSULTANT'S REPRESENTATIVE

.1 During the performance of the work, provide necessary labour and tools to assist the Engineer and the Engineer's Representative in measuring, checking, testing and examining the Contractor's work. The cost of all such being deemed to be incidental to the performance of the contract.

1.18 INSURANCE

.1 The Contractor must furnish the following insurance policies to the satisfaction of the Stratford Utility Corporation prior to commencement of any work.

.2 The Contractor shall, without limiting its obligations or liabilities herein and at its own expense, provide and maintain the following insurances in forms and amounts acceptable to the Owner.

.1 Comprehensive General Liability in an amount not less than $5,000,000. inclusive per occurrence against bodily injury, death and property damage, with a property damage deductible not exceeding two thousand five hundred dollars ($2,500.00). The Stratford Utility Corporation, Town of Stratford, WSP Canada Inc. and the Government of P.E.I. are to be added as an insured under this policy. Such insurance shall include, but not be limited to the following:

.1 Products and Completed Operations Liability;

.2 Blanket Written Contractual Liability;

.3 Contingent Employer's Liability;

.4 Personal Injury Liability;

.5 Non-owned Automobile Liability;

.6 Sudden and Accidental Pollution Liability;

.7 Fire Fighting Expense Liability.

.2 Automobile Liability on all vehicles owned, leased, operated, or licensed in the name of the Contractor in an amount not less than $2,000,000.00.

.3 All the foregoing insurance shall be primary and not require the sharing of any loss by any insurer of the Stratford Utility Corporation, WSP Canada Inc., and/or the Government of P.E.I. and preclude subrogation by the insurer against the aforementioned parties.

.4 Proof of Insurance; certified copies of the required insurance, as mentioned, must be presented to the Stratford Utility Corporation at the time of signing of the contract and shall be subject to the Stratford Utility Corporation's approval for adequacy of protection. Approval by the Stratford Utility Corporation of any policy filed by the Contractor shall in no way relieve the Contractor of its obligations to provide the insurance referred to in the contract, nor shall it imply that the policies are in accord with the terms of this agreement.

.1 All required insurance shall be endorsed to provide the Stratford Utility Corporation 60 days advance written notice of cancellation or material change.

.2 All insurances shall be in effect until issuance of the "Certificate of Final Acceptance" and for the duration of the Warranty Period

.3 The Contractor hereby waives all rights of recourse against the Stratford Utility Corporation, Town of Stratford, WSP Canada Inc., and the Government of P.E.I. with regard to damage to the Contractor's property.

.4 The Contractor shall require and ensure that each subcontractor maintain liability insurances comparable to that required above.

.5 Claims made to policies must have a 3-year extended reporting option on their policy.

.6 The Contractor agrees to indemnify and save harmless the Owner and the Owner's Representative from any and all costs, charges or expenses howsoever arising out of any breaches in the insurance coverages or part thereof.

.5 Property damage deductible shall be two thousand five hundred dollars ($2,500.00) per occurrence.

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 CASH ALLOWANCE

.1 The cash allowance shall be utilized for unforeseen items that may arise during construction, or other items that the Owner may require included in the work.

.2 The cash allowance shall not be used for items for which an established unit rate has been given during tendering.

.3 An amount of fifteen thousand dollars ($15,000) shall be allocated to this item and has been shown as a separate item within the schedule of unit prices.

1.2 UNUSED ALLOWANCE

.1 Any portion of the allowance amount remaining upon completion of the contract shall be credited to the Owner.

Part 2 – Products

2.1 NOT USED

.1 Not Used.

Part 3 – Execution

3.1 GENERAL

.1 The Contractor shall be allowed a ten percent (10%) mark-up for overhead and profit above actual costs for work done by the Contractor's own forces.

.2 For work performed by primary sub-contractor, the General Contractor shall be allowed five percent (5%) mark-up for overhead and profit above approved sub-contractors invoices.

.3 The primary sub-contractor shall be allowed ten percent (10%) mark-up for overhead and profit above actual costs for work done by the primary sub-contractor's own forces.

.4 For work performed by the primary sub-contractor's sub-contractors, the primary sub-contractor will be allowed five percent (5%) mark-up for each subsequent sub-contractor working under the sub-contractor's control.

.5 The maximum total mark-up for any Change Order or Change Directive shall be thirty percent (30%).

.6 No mark-up will be allowed for the cost of construction equipment when such costs are based on rates which already include contractor's overhead and profit.

.7 No amount of the cash allowance is to be released unless accomplished by a detailed Change Order signed by the Engineer and/or the Owner.

.8 Note that the above does not preclude the option of the Contractor Administrator and Contractor negotiating a lump sum item of unit price payment for change in the Work, Extra Work and Additional Work.

END OF SECTION

Part 1 - General

1.1 GENERAL

.1 Submit to the Engineer for review, Shop Drawings, product data and samples specified. Additional specific requirements for submissions are specified in individual sections of Divisions 2 to 48.

.2 Until submission is reviewed, work involving relevant product may not proceed.

.3 Incorrectly formatted, unclear or otherwise unsuitable quality for shop drawings shall be returned without review by the Engineer.

1.2 SHOP DRAWINGS

.1 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.

.2 All Equipment Shop Drawings must be complete in all respects and show clear compliance with the Specifications.

.3 Identify details by reference to sheet and detail numbers shown on Contract Drawings. Dimension in metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Maximum sheet size 850 x 1050 mm.

1.3 PRODUCT DATA

.1 Manufacturer's Standard Schematic Drawings, Catalogue Sheets, Diagrams, Schedules, Performance Charts, illustrations and other standard descriptive data may be accepted in lieu of Shop Drawings.

.2 Above will only be accepted if they conform to the following:

- .1 Delete information which is not applicable to project.
- .2 Supplement standard information to provide additional information applicable to project.
- .3 Show dimensions and clearances required.
- .4 Show performance characteristics and capacities.
- .5 Show Wiring Diagrams, when requested, and controls.

1.4 COORDINATION OF SUBMISSIONS

.1 Check and certify as correct, Shop Drawings, product data and samples prior to submission.

.2 Verify:

- .1 Field measurements
- .2 Field construction criteria

.3 Catalogue numbers and similar data

.4 Conformance with Specifications

.5 Clearly noted exceptions or variations to the specifications.

.3 Coordinate each submission with requirements of work and Contract Documents. Individual Shop Drawings will not be reviewed until all related Drawings are available.

.4 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless the Engineer gives written acceptance of specified deviations.

.5 Notify the Engineer, in writing at time of submission, of deviations from requirements of Contract Documents.

.6 After the Engineer's review, distribute copies.

1.5 SUBMISSION REQUIREMENTS

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Issue submissions at least 10 working days before dates reviewed submissions will be needed.

.3 Submit one reproducible transparency of Shop Drawings and six (6) copies of product data for review by the Engineer. Upon review, two reviewed copies of the Shop Drawings will be returned to the general contractor. It is the general contractor's responsibility to transfer these comments to additional copies of the Shop Drawings for use by suppliers and subcontractors.

.4 Accompany submissions with Transmittal Letter, in duplicate, containing:

.1 Date

.2 Project title and number

.3 Contractor's name and address

.4 Number of each Shop Drawing and product data

.5 Other pertinent data

.5 Submissions shall include:

.1 Date and revision dates

.2 Project title and number

.3 Name of:

.1 Contractor

.2 Subcontractor

.3 Supplier

.4 Manufacturer

.5 Separate detail when pertinent

.4 Identification of product or material.

.5 Relation to adjacent structure or materials.

.6 Field dimensions, clearly identified as such.

.7 Specification section number, where specified.

.8 Applicable Standards, such as CSA or CGSB numbers.

.9 Contractor's stamp, initialled or signed, certifying approval of submission, certification of field measurements and compliance with Contract Documents.

1.6 ENGINEER'S REVIEW

.1 Review of Shop Drawings and product data shall not relieve Contractor from responsibility for results arising from any error or omission.

.2 The Engineer will review the Drawings within a reasonable time and will return them stamped "REVIEWED", "REVIEWED AS NOTED" or "REVISE AND RESUBMIT".

.3 Resubmit immediately Drawings noted "REVIEWED AS NOTED" if requested by the Engineer to ensure that corrections have been made.

.4 Drawings requiring resubmissions to be either corrected and resubmitted or to be superseded by other submitted Drawings.

.5 Do not make any changes to Shop Drawings after final review without written permission to the Engineer.

.6 Make any changes in submissions which Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.

.7 Notify Engineer, in writing, when resubmitting, of any revisions other than those requested by Engineer.

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 CONSTRUCTION SAFETY MEASURES

.1 Observe and enforce construction safety measures as required by the National Building Code (latest edition) Part 8, the laws of the Province of Prince Edward, the laws of the Dominion of Canada, Prince Edward Island Worker's Compensation Board and all Municipal By laws, Policies and Authorities.

1.2 SAFETY REQUIREMENTS

.1 Construction Safety Measures:

.1 The work performed by any Contractor or subcontractor must comply with the Occupational Health and Safety Act and its Regulations. This Act and the Regulations are available from:

Island Information Service
P.O. Box 2000
Charlottetown, P.E.I.
C1A 7N8
Telephone: 368 4000

.2 The Contractor will be required to provide proof that their company complies with all provisions of the PEI Occupational Health and Safety Act, as well as the PEI Workers Compensation Act and Regulations.

.3 During the process of the quoted work, companies will be required, at the request of the Owner, to provide written verification that their work is in compliance.

.4 Contractor must have personnel trained and certified for work in confined spaces.

.5 The Owner or the Owner's Representative reserves the right to order changes in construction methods or stoppages of work if work does not comply with the Act. Any cost due to these changes or stoppages shall be the responsibility of the Contractor.

.6 The Contractor agrees to indemnify and save harmless the Owner and the Owner's representative from any and all costs, charges or expenses howsoever arising out of any breaches in the Occupational Health and Safety Act and its Regulations.

.2 All Contractors must have an identified Safety Representative for the project. This safety representative will be the person to which WSP and/or the Stratford Utility Corporation will give notice of any perceived safety issues and if the issue(s) is not rectified in a timely fashion, then the Provincial Occupational Health and Safety will be notified.

.3 WSP and the Stratford Utility Corporation are not acting as the Contractor’s Safety Representative, and do not accept responsibility of any safety issues that go unnoticed or unreported by WSP and/or the Stratford Utility Corporation. The responsibility still remains with the Contractor and it is the Contractor’s responsibility to have knowledge of the safe working practices required by OH&S and their company safety policy where one exists.

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 GENERAL

.1 The Contractor shall comply with the Environmental Protection Act and its Regulations. Not so as to limit the generality of the foregoing, the contractor agrees as follows:

1.2 FIRES

.1 Fires and burning of rubbish on site will not be permitted.

1.3 DISPOSAL OF WASTES

.1 Dispose of rubbish and waste materials at authorized site in accordance with local solid waste requirements.

.2 Remove and dispose containers and waste fluids associated with vehicle maintenance in waste disposal site approved by Engineer outside site boundaries.

.3 Disposal of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited. Dispose of all waste materials at waste disposal site approved by Engineer outside boundary. Littering is prohibited.

.4 Do not bury rubbish and waste material on site.

1.4 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump water containing silt in suspension into waterways, or drainage systems.

.3 Dispose of water containing silt in suspension in accordance with local authority requirements. Water from work areas must be pumped a minimum of 50 m from the waterways into sediment traps or into tank trucks.

.4 Construct temporary silt fences with sufficient surface areas as directed by Engineer, prior to commencing excavation of any nature, near waterways.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract or as directed by the engineer on site.

.2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control as required.

1.6 EROSION CONTROLS

.1 Contractor is required to install, inspect and maintain in proper working order temporary erosion, siltation and pollution control features as directed and approved by Engineer. These devices are to be removed in the proper manner.

.2 Cuts and fills carried out by Contractor adjacent to waterways are to be properly stabilized using handseeding, hydroseeding, sodding or other approved methods to

prevent entry of silt into waterway. Short-term erosion control devices approved by Engineer must be utilized in interim until long-term stabilization is established.

.3 To minimize runoff, work on slopes adjacent to water bodies will be curtailed during periods of heavy rainfall, as directed by the Engineer.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.7 VEHICULAR MOVEMENTS

.1 Restrict movement of vehicles and equipment to existing disturbed areas (access roads, borrow pits, disposal areas, and future right-of-ways).

1.8 DISPOSAL OF WASTES

.1 Dispose of all waste materials (including hazardous materials), containers and waste fluids associated with vehicle maintenance off site to the Engineers approval.

.2 All garbage must be stored and handled in conformance with local authority requirements. Maintain site in a tidy condition, free from accumulation of waste products, debris and litter.

.3 Should unsuitable excavated material be suspected of being contaminated this material must be tested by a materials testing firm and if confirmed, disposed of properly in accordance with local authorities having jurisdiction.

1.9 STORAGE AND HANDLING OF FUELS AND DANGEROUS CHEMICALS

.1 Fuel storage facilities will not be permitted on site.

.2 Exercise care in handling of fuels or dangerous materials to minimize potential for spills. Report immediately any spills to Engineer. Contractor is responsible for clean-up, repair or rehabilitation resulting from spills to satisfaction of Engineer.

.3 Equipment use will be restricted to the existing travelling right-of-way or contract limits. Use in other areas to be approved by the Engineer.

1.10 RELICS AND ANTIQUITIES

.1 Give immediate notice to Engineer if evidence of historical or archaeological finds are encountered during construction and await written instructions from Engineer before proceeding with the work.

.2 Relics, antiquities and items of historical interest found on site shall remain the property of the Province of Prince Edward Island.

1.11 SANITARY FACILITIES

.1 Temporary sanitary facilities will be required and permitted in designated areas only.

.2 Hours for servicing or cleaning of temporary sanitary facilities will be restricted, and timing for such activities must be approved by the Engineer.

1.12 INDEMNITY

.1 The contractor agrees to indemnify and save harmless the Owner and the Owner's representative from any and all costs, charges or expenses, however so arising out of any breaches of the Environmental Protection Act and its Regulations.

1.13 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

1.14 PROTECTION OF EXPOSED AREAS

.1 The Contractor must protect all exposed areas within the project limits as follows:

.1 Supply and place Geotextile Silt Fence around entire perimeter or as shown on drawings.

1.15 ON-SITE STABILIZATION

.1 At the end of each working day, stabilize exposed areas as required.

1.16 MEASUREMENT AND PAYMENT

.1 Items under Section 01 35 43 will not to be paid for separately but shall be considered incidental to the work required for the project.

Part 2 – Products

2.1 NOT USED

.1 Not Used.

Part 3 – Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 - General

1.1 RELATED WORK

.1 Section 31 23 33.01 - Excavation, Trenching and Backfilling

1.2 SCOPE OF WORK

.1 This section specifies requirements for providing materials testing and report presentation by an accredited Materials Testing Firm for the entire project work as specified herein.

.2 For the purpose of this contract, the Contractor is responsible for materials testing.

1.3 MEASUREMENT AND PAYMENT

.1 Materials testing shall not be paid for separately. All costs to be included into unit price pay items.

Part 2 - Products

2.1 MATERIALS TESTING REQUIREMENTS

.1 Sandstone (Premium Borrow & Select Borrow)

.1 Test requirements are as follows:

Test	Procedure	Frequency
Determination of % passing 75µm Sieve	ASTM C-117	One per material type as delivered to the job
Standard Proctor Density	ASTM D-698	Same as above.
Optimum Moisture	ASTM D-698	Same as above.
Field Density Determination	ASTM D-2922	One per 50 m/lift (minimum of 4 per contract)
Thickness Determination		Same as above.

.2 A Compaction Control Report for Sandstone (Premium Borrow & Select Borrow) showing, as a minimum, the following:

.1 Date tested

.2 Test location (chainage and offset)

.3 Material thickness

.4 Field moisture

.5 Optimum moisture

.6 % compaction

All Sandstone (Premium Borrow& Select Borrow) shall be compacted to 100% Standard Proctor Density.

.2 Gravel:

.1 Provide placement control which includes the following:

Test	**Procedure**	**Frequency**
Washed Sieve Analysis	ASTM C-136 & C-117	Three per material type as delivered to the job
Standard Proctor Density	AASHTO T-99 & T-224	Same as above.
Optimum Moisture	AASHTO T-99 & T-224	Same as above.
Field Density Determination	ASTM D-2922	One per 50 m/lift (minimum of 4 per contract)
Thickness Determination		Same as above.
Los Angeles Abrasion	ASTM C-131	One per pit source

.2 A Compaction Control Report for gravel showing, as a minimum, the following:

.1 Date tested

.2 Test location (chainage and offset)

.3 Material thickness

.4 Field moisture

.5 Optimum moisture

.6 % compaction

All gravel shall be compacted to 100% Standard Proctor Density.

.3 Hot Mix Asphaltic Concrete:

.1 The Contractor shall provide production and placement control which includes, but is not limited to, the following tests:

Test	**Procedure**	**Frequency**
Bulk Density	ASTM D2726*	At a frequency of one per 250 tonnes of each mix type (with a minimum of 2 per contract per mix type)
Marshall Stability	ASTM D-1559	Same as above.
Marshall Flow	ASTM D-1559	Same as above.
Maximum Theoretical Specific Gravity	ASTM D-2041	Same as above.
Air Voids	MARSHALL	Same as above.
Voids in Mineral Aggregate	MARSHALL	Same as above.
Voids Filled with Asphalt	MARSHALL	Same as above.

Test	**Procedure**	**Frequency**
% Asphalt Metered		Same as above.
% Asphalt Extracted	ASTM D-4125 or ASTM D-2172	Same as above.
Extracted Gradation (Washed)	ASTM C-136 & C-117	Same as above.
Combined Aggregate Specific Gravity	MARSHALL	Same as above.

***** *For specimens that contain moisture*

.2 The Contractor's documentation of production control shall include, as a minimum, the following:

- .1 Contractor (paving)
- .2 Contract
- .3 Date
- .4 Mix type
- .5 Job mix formula percentages
- .6 Sample times
- .7 Sample temperatures
- .8 Sample compaction temperatures

.3 The Contractor's documentation of placement control shall include, as a minimum, the following:

- .1 Mix temperature (minimum of two)
- .2 Mix thickness

.4 A Compaction Control Report showing, as a minimum, the following:

- .1 Date cored
- .2 Core location (station & offset)
- .3 Lift
- .4 Bulk Relative Density
- .5 Maximum Theoretical Relative Density
- .6 % Compaction
- .7 Lot Average % Compaction (based on a mean maximum theoretical relative density)
- .8 Core thickness
- .9 Average thickness
- .10 Specified thickness
- .11 T-test

.4 Concrete Curb and Gutter/Sidewalk:

.1 The Contractor shall provide placement control which includes:

Test	**Procedure**	**Frequency**
Air Content	CSA A23.1 & CSA A23.2	CSA A23.1
Slump	CSA A23.1 & CSA A23.2	CSA A23.1
Compressive Strength	CSA A23.1 & CSA A23.2	CSA A23.1
Thickness Determination	measure before pour	each pour

.2 Control Report for concrete showing, as a minimum, the following:

.1 Date tested
.2 Test location (chainage)
.3 Material thickness
.4 % air content
.5 Slump
.6 Compressive strength

.5 Trench Compaction:

.1 The Contractor shall provide placement control which includes:

Test	**Procedure**	**Frequency**
Standard Proctor Density	ASTM D-698	One per material type
Optimum Moisture	ASTM D-698	Same as above.
Field Density Determination	ASTM D-2922	One per line (*) / lift (minimum of 4 per contract)

***** *line definition is all pipe between two catchbasins and/or manholes.*

.2 A Compaction Control Report for Native Backfill showing, as a minimum, the following:

.1 Date tested
.2 Test location (chainage)
.3 Field moisture
.4 Optimum moisture
.5 % compaction

Compaction for all locations shall be 100% Standard Proctor Density.

.6 Bedding Sand (Where Required):

.1 Test requirements are as follows:

.1 Sieve analysis prior to delivery to site.

.2 Sieve analysis during the work to ensure requirements of section 402 of Department of Transportation, Infrastructure and Energy, “General Provisions and Contract Specifications for Highway Construction.”

.3 There shall be a maximum of 35% difference between the percents passing consecutive sieves.

Part 3 - Execution

3.1 SUBMISSION OF TEST RESULTS

.1 All test results and compaction results shall be grouped by item and 3 copies forwarded to the Engineer within 48 hours of completion of the item.

.2 The Contractor shall also submit upon project completion a bound report outlining all test results. Three copies of the final report shall be required.

.3 The final report as prepared by a recognized Materials Testing Firm shall include an executive summary stating that all materials as tested and used on the project meet project specifications.

.4 If all materials as tested do not meet project specifications, then the following shall occur:

.1 The Contractor shall immediately remove all materials that do not meet project specifications and replace them with materials that do meet project specifications at no additional costs to the Owner.

or

.2 The Contractor shall make arrangements with the Owner so as to satisfy the Owner that no short- or long-term negative consequences will occur as a result of the materials not meeting specifications. If the Contractor cannot satisfy the Owner of these requirements, then all materials that do not meet project specifications shall be removed and replaced by the Contractor at no additional costs to the Owner.

.3 All costs associated with non-compliance with specifications, including testing materials, labour and engineering, will be the Contractor’s responsibility.

END OF SECTION

Part 1 - General

1.1 DESCRIPTION

.1 This section includes both general and specific requirements for traffic control of vehicles and pedestrians during construction of this project.

1.2 MEASUREMENT AND PAYMENT

.1 Traffic Control required will be considered incidental to the project.

Part 2 - Products

2.1 NOT USED

.1 Not used.

Part 3 - Execution

3.1 GENERAL REQUIREMENTS

.1 The Contractor shall be responsible for all aspects of vehicle and pedestrian traffic control during construction on the various street sections.

.2 At least five days before construction start on a street section, the Contractor shall submit a Traffic Control Plan (TCP) to the Owner's Representative and the Owner.

.3 The TCP shall be prepared in accordance with requirements of the Temporary Workplace Traffic Control Manual prepared by the Prince Edward Island Department of Transportation and Infrastructure and Manual of Uniform Traffic Control Devices for Canada prepared by the Transportation Association of Canada.

.4 The Contractor shall assign a Traffic Control Plan (TCP) Manager who is trained in Work Zone Traffic Control to prepare, implement and update the TCP. The TCP Manager shall be responsible for the supervision of the traffic control persons, compliance with the TCP, the condition, placement, relocation and removal of all traffic control devices. The TCP Manager shall provide the Stratford Utility Corporation with contact coordinates and shall be available for calls on a 24 hour basis throughout the construction project.

.5 The Contractor shall arrange construction sites on street sections so as to provide at least one lane two-way traffic through the construction area with traffic controlled as required by Traffic Control Persons. Traffic Control Persons shall also be positioned on side streets, as well as the main street construction area, where necessary to comply with the TCP prepared by the TCP Manager.

.6 When temporary rerouting of traffic is required, the contractor should not divert traffic through residential areas for extended periods of time. Local traffic and emergency vehicles must have continuous access to streets in the construction area. It is essential

that a lane of sufficient width for passage of Fire Trucks be provided through the construction area.

.7 The Contractor shall advise the Fire Department, Police Department, and Island EMS of the construction schedule and any temporary detours on a daily basis.

.8 The Contractor shall maintain contact with the local transit company to coordinate bus route changes that may be required during the construction project.

.9 The Contractor must allow access for local Waste Management vehicles to reach black bins, green bins and recyclables on designated collection days.

.10 The Contractor is responsible to notify property owners, in advance, of construction activity on their street and of any disruption to their water supply or sewer service.

3.2 SPECIFIC REQUIREMENTS

.1 The Contractor will be required to remove the excavated materials from the site in order to maintain a lane of traffic open.

.2 On very narrow streets, the Contractor will be required to coordinate with emergency service providers to determine alternate access to the site. A plan must be approved by emergency service providers, and implemented, prior to the commencement of construction.

.3 The Contractor is required to notify all business owners who will be impacted by the construction activity and provide daily updates to the status of work in their vicinity. Commercial property owners must be notified in advance of any detours, street closures and/or controlled traffic that will impact their daily operations. Access to commercial properties must be maintained at all times. The contractor must accommodate large delivery vehicles, such as transport trucks, and ensure adequate room is available for access and egress from the commercial properties.

END OF SECTION

Part 1 - General

1.1 GENERAL

.1 Use new material and equipment unless otherwise specified.

.2 Within 7 days of written request by engineer, submit the following information for any or all materials and products proposed for supply:

.1 Name and address of manufacturer.

.2 Trade name, model and catalogue number.

.3 Performance, descriptive and test data.

.4 Manufacturer's installation or application instructions.

.5 Evidence of arrangements to procure.

.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify engineer in writing of any conflict between these specifications and manufacturer's instructions. Engineer will designate which document is to be followed.

.3 Provide operation and maintenance manuals for all materials and products that require such.

1.3 DELIVERY AND STORAGE

.1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance with supplier's instructions.

1.4 CONFORMANCE

.1 When material or equipment is specified by standard or performance specifications, upon request of Engineer, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.5 SUBSTITUTION

.1 Proposals for substitution may be submitted only after award of contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions.

.2 Proposals will be considered by Engineer if:

.1 Products selected by tenderer from those specified are not available, or

.2 Delivery date of products selected from those specified would unduly delay completion of contract, or

.3 Alternative products to those specified, which are brought to the attention of, and considered by Engineer as equivalent to those specified and will result in a credit to the contract amount.

.3 Should proposed substitution be accepted either in part or in whole, assume responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as a result of substitution.

.4 Amounts of all credits arising from approval of substitutions will be determined by Engineer and contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of Engineer.

1.6 CONSTRUCTION EQUIPMENT AND PLANT

.1 On request, prove to the satisfaction of the Engineer that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

.2 Maintain construction equipment and plant in good operating order.

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 DESCRIPTION

.1 This Section specifies requirements for submission of layout of all facets of the project and the preparation and submission of Record Drawings.

.2 It is the intent of this section that a Prince Edward Island Land Surveyor be commissioned to provide coordinates for all above ground utilities and the appurtenances for the purposes of Record Drawings and also confirm any necessary inverts supplied by the Contractor's record drawings. The Contractor will be responsible for all remaining requirements of this section.

1.2 MEASUREMENT AND PAYMENT

.1 There will be no measurement for payment under this section. Project Layout / Record Drawings will be considered incidental to the project.

Part 2 - Products

2.1 NOT USED

.1 Not Used.

Part 3 - Execution

3.1 PROJECT LAYOUT

.1 Initial Layout:

.1 A Prince Edward Island Land Surveyor shall provide initial control points for use by the Contractor's survey crew. All remaining layout shall be the responsibility of the Contractor's survey crew, unless noted otherwise.

.2 Construction Layout:

.1 The Contractor's survey crew shall be permitted to provide layout for normal daily construction activities. Where deemed necessary by the Contractor and/or the Engineer, the services of a Prince Edward Island Land Surveyor shall be utilized for the installation of control points.

.2 A Prince Edward Island Land Surveyor shall provide the following additional services:

.1 Locate property rights of way where water and sewer services are to be located.

.2 Locate and layout all service easements as identified in plans and specifications.

3.2 CONTROL AND CERTIFICATION

.1 The Engineer shall provide the Contractor with three (3) sets of full-size contract drawings for Record Drawings purposes.

.2 Maintain Project Record Drawings and record accurately deviations from contract drawings caused by site conditions or changes ordered by the Engineer. Submit typed report outlining all deviations to the Engineer.

.3 Mark changes in red on one set of contract drawings.

.4 The Contractor shall record the following items:

.1 Water, Sewer and Storm Drainage System

.1 Depths of various elements of works in relation to geodetic elevation.

.2 Horizontal and vertical location of all above ground and underground utilities and appurtenances referenced to permanent surface features to the satisfaction of the Engineer.

.3 Field changes of dimensions.

.4 Bends, grade changes, and other significant deviations which are concealed in construction and cannot be identified by visual inspection following construction.

.5 Manholes, catch basins, invert elevations, elevation and locations of water, sewer and storm drainage system. and locations of water and sewer services.

.6 Determined invert elevation of all sewer services at R.O.W. limits.

.5 At completion of project and prior to final inspection, neatly transfer records to two sets of contract drawings using fine red marker. Neatly print lettering and number in size to match original. Lines may be drawn free hand but shall be neat and accurate. Add at each Drawing Title Block Note: "AS RECORDED".

.6 The Prince Edward Island Land Surveyor will be required to provide coordinates for all above ground utilities and appurtenances and also confirm all inverts and elevations shown on Contractor’s record drawings.

.7 Submit one set of Red Line Mark-ups to the Engineer and submit the second set to the contractor's Prince Edward Island Land Surveyor.

3.3 RECORD DRAWINGS

.1 Data Collection:

.1 The Contractor shall compile the following information and prepare a full set of record drawings.

.1 One digital copy of all design drawings from the Engineer in Civil 3D drawing files or in DXF files.

.2 One set of Red Line Mark-ups as prepared by the Contractor.

.3 Field measurements for all additional data required to prepare a complete set of "Record Drawings.”

.2 Submission Requirements:

.1 "Record Drawing" plans shall be submitted to the Engineer by the Contractor in the digital and hard copy format with "RECORD DRAWINGS" clearly printed on such plans.

.1 Two complete sets of preliminary "Record Drawings", hard copy format must be submitted to the Engineer for initial review. Resubmit final "Record Drawings" with any deletions or additions required by the Engineer's initial review.

.2 Final "Record Drawings" submission shall consist of the following:

.1 Two copies on USB stick in Civil 3D format (latest version).

.2 Three hard copies on paper.

.2 Record Drawings shall include the following as applicable:

.1 Existing Conditions

.1 If existing conditions data is included, provide all information included on design drawings, along with any changes to existing conditions as required.

.2 Storm Drainage System

.1 If storm drainage systems are included, provide all information included on design drawings along with any items that vary from design drawings. Typical items include catch basins, pipes, culverts, profiles, alignment, etc.

.3 Sewer Portion

.1 If a sewer system is included, provide all information included on design drawings along with any items that vary from design drawings. Typical items include manholes, pipes, profiles, alignment, etc.

.4 Water Portion

.1 If a water system is included, provide all information included on design drawings along with any items that vary from design drawings. Typical items include all services, valves, bends, hydrants and main lines.

.5 Details

.1 If details data is included, provide all information included on design drawings along with any items that vary from design drawings.

.6 Structures

.1 If a building and/or structure is included, provide all information included on design drawings along with any items that vary from design drawings, including electrical and mechanical items.

.3 All data shall be superimposed onto original design plans as follows:

.1 Place location of all items previously described in plan form.

.2 Provide "tie ins" for all water and sewer services to the nearest permanent on-site structure. Two individual measurements are required for each service.

.3 Provide co-ordinates for all above ground utilities and appurtenances.

.4 Revise profiles as required if changes to original design plans occurred.

.5 Remove all design notes from original design plans.

.6 Clearly stamp "RECORD DRAWINGS" on each drawing along with date, contractor's name, surveyor's name (where necessary).

.7 All drawings shall be signed by the Contractor and the Prince Edward Island Land Surveyor (where necessary).

Note: It is the intention of this section that all drawings issued for tender are to be modified as required and returned as “Record Drawings” drawings including cover sheets and details.

3.4 SAMPLE

.1 A sample drawing showing a typical Record Drawings will be provided to the successful tenderer. The sample drawing quality is to be considered as a minimum requirement for Record Drawing submission from the Contractor.

END OF SECTION

Part 1 – General

1.1 REFERENCE STANDARDS

.1 Do cast in place concrete work and testing in accordance with CAN/CSA A23.1 00, and CAN/CSA-A23.2 00, except where specified otherwise.

1.2 MEASUREMENT AND PAYMENT

.1 Concrete curb removal and replacement shall be compensated in meters of curb placed and shall include, but is not limited to, materials, labour, sawcutting, removal and disposal of existing curb, Class “A” gravel, new curb placement, etc.

Part 2 – Products

2.1 MATERIALS

.1 Portland cement: to CSA Standard A5 00, Type 10, Normal.

.2 Water: to CSA A23.1 00.

.3 Aggregates: to CSA A23.1 00.

2.2 CONCRETE MIXES

.1 Proportion normal density concrete in accordance with CAN A23.1-00.

.1 Minimum compressive strength at 28 days: as required for design and/or class of exposure.

Part 3 – Execution

3.1 WORKMANSHIP

.1 Obtain Engineer's approval before placing concrete.

.2 Ensure reinforcement and inserts are not disturbed during concrete placement.

.3 Prior to placing of concrete obtain Engineer's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.4 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels and pack solidly with non shrink grout to positively position and anchor dowels.

3.2 FINISHING

.1 Finish concrete in accordance with CSA A23.1 00.

.2 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges unless otherwise detailed.

END OF SECTION

Part 1 – General

1.1 RELATED WORK

.1 Section 01 45 00 – Material Testing

.2 Section 32 92 23 – Topsoiling, Seeding and Sodding

.3 Section 33 05 16 - Manholes, Catchbasins and Chambers

.4 Section 33 30 00 – Sanitary Sewers

.5 Section 33 40 00 – Storm Drainage System and Culverts

1.2 DEFINITIONS

.1 Rock Excavation: is defined as limestone, sandstone, granite or similar rocks in solid beds or masses in original or stratified position, which can be removed only by continuous drilling, blasting or use of pneumatic tools, and all boulders of one cubic meter in volume or larger. All rock excavation must be assessed by the Engineer.

.2 Common Excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including asphalt, dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and/or excavated with heavy construction equipment. Material which can be excavated with a 35-tonne hydraulic excavator equipped with a 1.0-meter-wide bucket with rock teeth or ripper shall be classified as common excavation.

.3 Theoretical Trench Width: is the maximum width that will be applied to an individual pay item under this section. If the Contractors deems that a width greater than the theoretical trench width is necessary, then additional costs are to be included in maximum theoretical trench width. Theoretical trench width for the project will be 1.5 meters, unless otherwise noted.

1.3 PROTECTION OF EXISTING FEATURES

.1 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to commencing any excavation work, notify applicable owner or authorities, establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, electric, telephone and other utilities and structures encountered as indicated. Obtain direction of Engineer before moving or otherwise disturbing utilities or structures. Any damage to such utilities must be repaired to the Engineer’s approval, at the Contractor’s expense.

.5 Advise utility company of requirement to re route existing lines in area of excavation, if required. All costs for such work will be incorporated into the unit price for each specific item. No extra will be allowed.

1.4 MEASUREMENT AND PAYMENT

.1 Common excavation will be considered incidental to work performed in the related sections.

.2 Rock excavation will be measured in cubic meters using the average end area method between changes in rock cross section. Dimensions used to calculate end areas shall be theoretical trench width of 1.5 meters and depth from surface of rock as exposed on sides of trench after excavation to bottom of specified bedding for each pipe trench.

Boulders larger than one cubic meter, any portion of which is within theoretical trench will be classified as rock and measured following removal from trench.

Cubic meter measurement will be full compensation for excavation, disposal, backfill, sandstone replacement, labour and material.

.3 Gravel Driveway Reinstatement will be based on square meter measurement of gravel placed and will include select borrow, Class 'A' gravel, as shown in "Typical Driveway Repair" detail. Width of cut trench is the responsibility of the Contractor to determine based upon equipment, materials, constructability requirements, etc. Maximum pay width is 1.5 m.

.4 Asphalt Road Cutting and Resurfacing will be based on square meter measurement of asphalt base placed and will include sawcutting, select borrow, Class 'A' gravel, tack coat, asphalt base, asphalt seal and associated milling and overlap as shown in the Typical Local Road Reinstatement detail. Unless specified otherwise, gravel sub-base to be 150mm thickness minimum and select borrow to be 300mm thickness. Width of cut trench is the responsibility of the Contractor to determine based upon equipment, materials, constructability requirements, etc. Maximum pay width is 1.5 m.

Part 2 – Products

2.1 MATERIALS

.1 Type 1 Fill:

.1 Hand selected, hand placed, excavated material approved by the Engineer, free from shale, clay, friable materials, organic matter and other deleterious substances.

.2 Type 2 Fill:

.1 Selected material from excavation or other sources, approved by Engineer for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Type 3 Fill (Granular Bedding):

.1 Granular bedding shall have a maximum particle size of 28 mm and consist of a well-graded, hard, durable, crushed or pit run, coarse sand or gravel that is free of organic matter, chemicals and other impurities.

.2 Following are suggested gradations for granular bedding (the selected gradation(s) should conform to the pipe manufacturer's requirements):

Sieve Size, mm	% Passing, by mass
28	100
20	85 - 100
14	60 - 90
10	25 - 60
5	0 - 10
2.5	0 - 5
1.25	---

.4 Type 4 Fill (Bedding Sand):

.1 Bedding sand shall meet the requirements of Section 402 of Department of Transportation, Infrastructure and Energy "General Provisions and Contract Specifications for Highway Construction."

.5 Type 5 Fill:

.1 Common Term: Class "B" Gravel.

.2 Aggregate Quality: sound, hard durable material free from soft, thin, elongated particles, organic material or other deleterious substances.

.3 Flat and elongated particles are those whose greatest dimension exceeds five times their least dimension.

.4 Class "B" gravel shall meet the following requirements:

.1 Gradation to be within the following limits when tested to ASTM C136 and giving a smooth curve without sharp breaks and when plotted on a semi-log grading chart.

Sieve Size, mm	% Passing, by Mass
31.5 mm	100
25.0 mm	95 - 100
12.5 mm	50 - 83
4.75 mm	30 - 60
1.18 mm	15 - 43
0.6 um	10 - 35
0.3 um	5 - 26
0.075 um	3 - 7

.5 Los Angeles Abrasion to ASTM C131 maximum percent loss by mass: 50.

.6 The percent of crushed material will be determined on the fraction of particles by mass retained on the 4.75 mm sieve having one mechanically fractured face.

.7 Flat and elongated: max. 20%.

.8 A minimum of 13 percent retained between the 4.75 mm and 0.6 mm sieves.

.6 Type 6 Fill:

.1 Common term: Class "A" Gravel. (Imported)

.2 Aggregate Quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material or other deleterious substances.

.3 Flat and elongated particles are those whose greatest dimension exceeds five times their least dimension.

.4 Type 6 Fill shall meet the following requirements:

.1 Gradation to be within the following limits when tested to ASTM C136 and giving a smooth curve without sharp breaks and when plotted on a semi-log grading chart.

Sieve Size, mm	% Passing, by Mass
31.5 mm	100
25.0 mm	95 - 100
12.5 mm	50 - 83
4.75 mm	30 - 60
1.18 mm	15 - 40
0.6 um	10 - 32
0.3 um	5 - 22
0.075 um	3 - 9

.2 Los Angeles Abrasion to ASTM C131 maximum percent loss by mass: 35.

.3 The crushed material shall be a minimum of 75 percent by mass retained on a 4.75 mm sieve having 2 or more mechanically fractured faces.

.4 Petrographic number (max.): 150 (as per PEI Dept. of Transportation, Infrastructure and Energy).

.5 A minimum of 13 percent retained between the 4.75 mm and 0.6 mm sieves.

.7 Type 7 Drainage Gravel:

.1 Common Term: Class "E" Gravel

.2 Crushed and screened, hard durable stone, free from clay and organic material, graded to have 100% passing the 31.5 mm sieve, and approved by the Engineer.

.8 Filter Fabric: Terrafix 270R or equal.

Part 3 – Execution

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 STOCKPILING

.1 Stockpile fill materials in areas designated by Engineer. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.3 DEWATERING

.1 Keep excavations free of water while work is in progress.

.2 Protect open excavations against flooding and damage due to surface run off.

.3 Dispose of water in a manner not detrimental to public and private property, or any portion of work completed or under construction.

.4 Submit for Engineer's review details of proposed dewatering methods.

3.4 EXCAVATION

.1 Advise Engineer in advance of excavation operations to enable original cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions indicated.

.3 Remove concrete masonry paving walks, demolished foundations, rubble and other obstructions encountered during excavation.

.4 Excavation must not interfere with normal 45-degree splay of bearing from bottom of any footing.

.5 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open at end of day's operation.

.6 Dispose of surplus and unsuitable excavated material off site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.9 Notify Engineer when soil at bottom of excavation appears unsuitable and proceed as directed by Engineer.

.10 Obtain Engineer approval of completed excavation.

.11 Remove unsuitable material from trench bottom to extent and depth directed by Engineer.

.12 Where required due to unauthorized over excavation, correct as follows:

.1 Fill under bearing surfaces and footings with gravel.

.2 Fill under other areas with Type 2 fill compacted to minimum of 100% maximum dry density to ASTM D698.

.13 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.5 FILL TYPES AND COMPACTION

.1 Use fill of types as indicated or specified below. Unless otherwise specified, compact to following densities:

.1 Type 1: 100% maximum dry density.

.2 Type 2: 100% maximum dry density.

.3 Type 3 (Granular Bedding): 100% maximum dry density.

.4 Type 4 (Bedding Sand): 100% maximum dry density

.2 Contractor must meet the compaction requirements for the type of fill used. Should settlement occur in the trench during the maintenance period, Contractor will be required to repair settled area and give an additional year of maintenance for that area.

3.6 BACKFILLING

.1 Do not proceed with backfilling operations until Engineer has inspected and approved installations and approved all material to be used in backfilling operations.

.2 Areas to be backfilled to be free from debris, snow, ice, water or frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing.

.3 Place layers simultaneously on both sides of installed work to equalize loading.

.4 Place material by hand under, around and over installations until 300 mm of cover is provided. Dumping material directly on installations will not be permitted.

.5 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.6 .1 All sewer pipe to be imbedded in a Type 4 material to 300 mm above the top of pipe. The remainder of the material is to be Type 2.

.2 Use Type 7 drainage material as required when water is present in the trench and pumping is not adequate to control inflow.

.7 Place filter fabric over top of all Type 7 drainage material.

3.7 RESTORATION

.1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by Engineer.

.2 Reinstate pavement, curbs and sidewalks to condition and elevation which existed before excavation.

.3 Clean and reinstate areas affected by work as directed by Engineer.

.4 All roadways and asphalt mixes to meet Prince Edward Island Department of Transportation, Infrastructure and Energy specifications.

END OF SECTION

Part 1 – General

1.1 DESCRIPTION

.1 This section specifies requirements for working around existing trees during the course of construction. The work shall include protective zone requirements, fence protection, strapping of trunks, protection and pruning of roots, excavation and backfill requirements.

1.2 DEFINITIONS

.1 Maximum transplantable size: An existing tree shall be considered to be larger than the maximum transplantable size when its trunk is greater than 100 millimetres in diameter. This assumes conventional transplanting methods and equipment is being used. The definition precludes the use of larger specialized equipment used to move trees larger than 100 mm in diameter which may be affected by construction activities and a decision to relocate specific trees.

1.3 MEASUREMENT AND PAYMENT

.1 Items under this section will not be paid for separately but shall be considered incidental to the work required to complete the project.

Part 2 – Products

2.1 STRAPPING

.1 Strapping required for the protection of tree trunks of existing trees shall consist of wood slat snow fencing fastened securely around the tree trunk and wrapped with yellow or orange warning or marking tape. Alternately, use wooden planks with a minimum size of 25 x 150 x 2440 millimetres spaced at 75 to 100 mm around the trunk of the tree and securely fastened.

2.2 FENCING

.1 Fencing shall be a minimum height of 1.5 m and of heavy-duty construction of either snow fencing or flexible rubber-coated chain link material supported by metal T-bar or a minimum of 50 mm x 50 mm wooden stakes at a minimum spacing of 1.5 m apart to provide a rigid barrier around the tree.

2.3 MULCH

.1 Natural bark mulch or wood chips to be used where a protective cover is required over the roots to avoid compaction.

Part 3 – Execution

3.1 CONSTRUCTION METHODS

.1 Undertake all protective measures for trees and shrubs, beyond the maximum transplantable size, as indicated on the drawings and as specified herein. Trees less than the maximum transplantable size shall be protected similarly or relocated as required.

3.2 IDENTIFICATION AND REMOVAL

.1 Prior to the award of the contract, the Engineer will have identified all those trees that may be impacted by the construction activities.

3.3 TREE PROTECTION AND PROTECTIVE ZONE

.1 Where possible, establish a protective zone for all trees and shrubs to be preserved on site.

.2 Trees involved within the construction area shall have a 2.0 m radius protective zone calculated from the circumference at the base of the trunk which will remain free of excavation, trenching, grade changes, stock piling of materials and soil compaction throughout the duration of the project.

.3 Protective rigid fencing installed around these areas is required.

.4 Protect roots of trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

3.4 STRAPPING OF TREE TRUNKS

.1 Where it is not possible to establish a minimum 2.0 m protection zone around a tree or group of trees that are to be preserved within and adjacent to proposed construction areas strapping will be required.

.2 This requires a double wrap of wood slat snow fencing, or other suitable wood planks (minimum 50 mm x 100 mm) spaced 75 to 100 mm around the trunk strapped to the trunk of the trees to protect the tree trunk from construction impact damages.

3.5 EXCAVATION AND BACKFILL AT THE BASE OF TREES

.1 Minimize stripping of topsoil and vegetation around the base of trees and shrubs to be preserved.

.2 Augering under existing trees may be an acceptable method of underground installations. Alternatively, air spade technology may be employed for trenching to minimize root damage.

.3 During excavation, protect exposed roots of trees and where open trenches are required. Where the roots of trees are damaged during excavation, torn or broken roots to be hand pruned to flush cuts.

.4 Any other excavation within the 2m radius protective zone to be approved by an Engineer.

.5 Where heavy traffic with construction equipment is anticipated, the Engineer may require a protective layer of mulch 100-150 mm in depth applied around the bases of the trees to avoid compaction of surface roots.

.6 Excavated trees, holes, shafts, and trenches associated with construction efforts, and involving exposed roots from adjacent publicly owned trees, shall be kept moist in the hot and dry weather to prevent roots desiccation. Shading is acceptable where water use is unsafe. If required, moist burlap can be used to cover exposed roots to avoid drying out.

3.6 ROOT PRUNING

.1 In the event of major reconstruction efforts, ensure that root pruning be done along the length of the work in an approved manner, such as with a trencher, chain saw, hand saw, lopping, shears or pruners.

.2 Keep roots disturbance to a minimum during excavation.

.3 A clean severance of the root system is required. Minor root removal, when necessary, shall be done according to approved techniques.

.4 Where major roots come into conflict, the Engineer shall be contacted for input.

.5 Roots shall not be torn off with power equipment.

3.7 LIMB AND BRANCH PROTECTION

.1 Trees and limbs overhanging the construction area shall not be damaged.

.2 If the tree canopy height needs to be raised to allow for reasonable construction clearances, the work shall be performed under the direction of a qualified person using proper arboriculture practices.

.3 All tree pruning work shall be performed according to the safety standards as prescribed under the PEI Occupational Health and Safety Act.

3.8 REMEDIAL REPAIR WORK TO TREES

.1 During the course of construction, immediately notify the Engineer of any significant damage to a tree or trees.

3.9 TREES DAMAGED, REMOVED OR LOST DUE TO CONSTRUCTION

.1 Trees removed without prior authority from the Engineer, shall be replaced at the Contractor’s expense.

.2 In general, destroyed trees are to be replaced at the rate of one tree for every tree lost with a minimum size of 60 mm calliper measured 15 cm from the base of the tree.

.3 The location and species of replacement trees is to be similar to that which was damaged by construction.

.4 In the event that trees that are larger than the maximum transplantable size are destroyed or damaged, costs may be deducted from monies otherwise due as determined by the Engineer.

3.10 QUALITY CONTROL AND FINAL INSPECTION

.1 Final Inspection:

.1 Prior to substantial performance of the contract where trees have been damaged, the Engineer shall arrange for a final inspection of all trees on the project with the Contractor.

.2 All repair/replacement monies due as a result of tree damage by the Contractor may be deducted from monies otherwise due.

END OF SECTION

Part 1 – General

1.1 WORK INCLUDED

.1 This section specifies requirements for topsoiling, seeding and sodding. Work includes finish grading, supply and placing of topsoil, seed and sod and all appurtenances required to complete the work to the satisfaction of the Engineer.

1.2 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Protection

.2 Section 31 23 33 – Excavating, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 CAN/CGSB 16.2 M Emulsified Asphalts, Anionic Type, for Road Purposes.

.2 Canadian Nursery Trades Association; Canadian Standards for Nursery Stock.

1.4 DELIVERY AND STORAGE

.1 Schedule deliveries to minimize storage at job site without causing delays.

.2 Deliver, unload and store sod on pallets.

.3 Schedule sod delivery to coincide with topsoil operations.

1.5 MEASUREMENT AND PAYMENT

.1 There will be no measurement for payment under this section. Topsoiling, seeding and sodding required will be considered incidental to the project. All costs should be considered and included in the respective line item in the Schedule of Unit Prices.

Part 2 – Products

2.1 TOPSOIL

.1 Friable loam containing minimum of 4% organic matter for clay loams and 2% for sandy loams to maximum of 20% by volume and having a pH of 5.5 to 7.5. Topsoil containing subsoil, roots and stones larger than 50 mm, weeds, couch grass, crabgrass, foreign objects or toxic materials is not acceptable.

2.2 FERTILIZER

.1 Complete commercial, specially blended for promoting root development of newly seeded or sodded areas.

.2 Formulation ratio: 1:2:2 spring seeding

1:4:4 fall seeding

2.3 LIME

.1 Agricultural grade ground limestone containing total 85% carbonates and graded as follows:

Sieve Designation	Cum. % Passing
14 000	90
160	50

2.4 SEED

.1 Canada #1 lawngrass mixture to Government of Canada Seeds Regulations where applicable having minimum germination of 80% and minimum purity of 85%. Seed mixture: 40% Kentucky Blue Grass; 40% Creeping Red Fescue; 20% Perennial Rye Grass.

2.5 HYDRAULIC SEED MULCH

.1 Wood or wood cellulose fibre, free of germination or growth inhibiting ingredients and forming blotter like ground cover allowing absorption and percolation of water.

2.6 WATER

.1 Clean, fresh, and free from impurities that inhibit plant growth.

2.7 SOD

.1 Cultivated turf grass containing not less than 40% Kentucky Bluegrass, free of weeds, and with no surface soil visible when mowed to height of 50 mm; soil portion of uniform thickness, not more than 15 mm and to Section 17 of the Canadian Standards for Nursery Stock. All sod must be nursery sod.

2.8 ACCESSORIES

.1 Pegs: wood, 25 mm x 25 mm x 200 mm nominal size.

.2 Mesh: 37 mm chicken wire or plastic.

Part 3 – Execution

3.1 FIELD CONDITIONS

.1 Do not perform work under adverse field conditions, such as frozen ground or ground covered with snow, ice or standing water, without prior approval.

3.2 PREPARATION

.1 Grade subgrade to eliminate uneven areas and rough spots, and to ensure positive drainage. Remove all debris, roots, branches, stones in excess of 50 mm diameter, and other deleterious materials. Remove any subsoil that has been contaminated with toxic materials. Dispose of contaminated material off site.

.2 Cultivate area to depth of 100 mm prior to placing topsoil.

.3 Repeat cultivation in those areas where equipment used for hauling and spreading has compacted soil.

3.3 PLACING TOPSOIL

.1 Do not spread topsoil until subgrade has been inspected by Engineer.

.2 Spread topsoil in uniform layer over dry subgrade where seeding or sodding is indicated. Do not place topsoil on frozen subgrade.

.3 Keep topsoil 15 mm below finished grade for sodded areas.

.4 Apply topsoil to depth of 100 mm unless otherwise indicated.

.5 Fine grade topsoil to lines and elevations indicated, leaving surface smooth and uniform with a fine loose texture. Obtain approval of topsoil grade and depth before proceeding with seeding or sodding.

3.4 APPLICATION OF LIME AND FERTILIZER

.1 Apply lime at a rate of 50 kg per 100 square meters or at a rate determined by soil analysis. Mix lime thoroughly into full depth of topsoil prior to application of fertilizer.

.2 For dry seeding and sodding apply fertilizer with mechanical spreaders over entire area of topsoil at nitrogen rate of 500 g/100 m² or at a rate determined by soil analysis.

3.5 DRY SEEDING

.1 Seed during local growing season when natural moisture is available to ensure germination and growth.

.2 Apply seed with mechanical spreader at a rate of 2 kg/100 m2 or as recommended by seed manufacturer. Cover and roll with a roller having a mass of 50 kg/m of width.

3.6 SODDING

.1 Lay sod as soon as possible after lifting to ensure proper establishment.

.2 Place sod in rows perpendicular to slopes, smooth and even with adjoining areas, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections.

.3 Roll sod with a roller having a mass of 50 kg/m of width. Repeated rolling to correct irregularities in grade is not permitted.

.4 Water within 4 hours of placing to obtain moisture penetration through sod into top 100 mm of topsoil.

.5 For slopes steeper than 1:2, place mesh over topsoil. Secure mesh in place with pegs and cover mesh lightly with topsoil. Lay sod and secure with pegs. Place pegs 100 mm below top edges using 3 pegs per meter. Drive pegs flush with surface of root mat.

3.7 HYDRAULIC SEEDING

.1 Seed during local growing season when natural moisture is available to ensure germination and growth.

.2 Measure all quantities of material by weight or by weight- calibrated volume measurement.

.3 Charge seeder with water, and while agitating, slowly add mulch, seed, fertilizer and lime until all components are thoroughly mixed.

.4 When required, add erosion control agent to seeder and mix thoroughly to complete seeding slurry.

.5 Slurry application per 100 m2:

.1 Seed – 2.0 kg or as recommended by seed manufacturer.

.2 Fertilizer – 500 g of nitrogen.

.3 Mulch = 10 kg.

.4 Erosion Control Agent – as recommended by manufacturer.

.5 Water – minimum 100 litre.

.6 Lime – as determined by soil analysis.

.6 Apply slurry uniformly, blending into grassed areas.

.7 Remove slurry from items and areas not designated to be sprayed.

3.8 MAINTENANCE

.1 Water adequately to assure continued growth. Control water to prevent washouts.

.2 Mow grass to height of 60 mm when it first reaches a height of 80 mm. Maintain at height of 50 70 mm for two more mowings. Remove clippings which could smother grass.

.3 Fertilize grassed areas after first mowing.

.4 If grass is damaged for any reason (ie., road salt), the Contractor will be required to replace and fertilize for one year after initial sodding.

3.9 ACCEPTANCE

.1 Grassed areas will be accepted upon completion of third mowing provided that:

.1 Growth is properly established.

.2 Area is free of bare and dead spots and without weeds.

.3 No surface soil is visible when grass has been cut to a height of 60 mm.

.2 Area sodded or seeded in the fall will be accepted the following spring one month after start of growing season providing that acceptance conditions are fulfilled.

.3 Continue maintenance and mowing until acceptance.

END OF SECTION

Part 1 – General

1.1 WORK INCLUDED

.1 This section specifies requirements for the construction of precast concrete manholes and catchbasins. Work includes supply and installation of concrete bases, precast sections, metal castings and testing.

1.2 RELATED WORK

.1 Section 31 23 33 – Excavating, Trenching and Backfilling

.2 Section 33 40 00 – Storm Drainage Systems and Culverts

1.3 MEASUREMENT AND PAYMENT

.1 Manholes to be measured in metres from top of cover or grating to lowest pipe invert, including manhole frame and cover, waterproof membrane, benching and all labour and materials required for complete installation and testing.

.2 Harbourview Drive Lift Station removal shall be compensated for as a lump sum item and shall include, but is not limited to, reinstatement of disturbed grassed areas with 100mm topsoil and sod and full removal and disposal of the following:

.1 Wet Well

.2 Duplex Pump Set

.3 All Interior Piping

.4 Venting

.5 Controls

.6 Electrical Panels

.7 Panel Supports

.8 Electrical Service, including conductor and riser conduit

.9 Capping of existing force main as noted on drawings

All work is to be included in the lump sum price submitted for a complete removal of the Harbourview Drive Lift Station.

.3 All manholes to be demolished are to be cut down 1.2 meters below finished grade unless noted otherwise. All inlet and outlet piping are to be securely plugged with concrete or to Engineer's approval. Backfill with approved sandstone and reinstate surface as per standard details. Abandoning the existing sewer main and manholes will be paid for on a per unit basis under manhole demolition.

.4 Temporary manhole shall be compensated for as a lump sum item and shall include, but is not limited to, all labour, equipment, materials, excavation, etc., for the installation and removal of a temporary manhole structure. Also included in this item is the supply of a sewage disposal pump to be housed in the temporary manhole capable of handling a minimum 5.1 GPM, which is the anticipated peak flow to be managed. Temporary manhole shall have a minimum storage volume of 1.5 m^3 and the sewage disposal pump shall require float control or manual control for the duration of bypass procedure.

1.4 REFERENCE STANDARDS

.1 ASTM C478M Precast Reinforced Concrete Manhole Sections (Metric).

.2 CGSB 56 GP 4 Sealing Compound, Sewer Pipe Joint, Cold Applied, Mineral Filled, Bituminous.

1.5 HANDLING AND STORAGE

.1 Prevent damage to materials during storage and handling.

Part 2 – Products

2.1 GENERAL

.1 Manholes and catchbasins shall be constructed of precast concrete sections as per ASTM C478M, "Standard Specifications for Precast Reinforced Concrete Manhole Sections."

.2 The diameter of the manholes/catchbasins is to be as shown on the drawings and details.

.3 All storm manholes/catchbasins are to have a minimum of 300 mm sump complete with a solid precast reinforced concrete bottom.

.4 a) Catchbasins shall be concrete structures complete with integral base. Diameter to be as indicated on drawings. These will be topped with grade rings to reduce the diameter to 600 mm.

b) Catchbasins required for yard laterals shall be 450 mm dia. structures without sumps. These structures shall be known as “Sluice Box.”

.5 Joints between the grade rings and frame are to be sealed with single component, hydrophobic, flexible sealant/adhesive, such as XSEAL by Fernco, or approved equal. Butyl rubber gaskets such as RAMNEK are permitted for use on intermediate structure sections.

.6 All manholes are to be the same diameter from top to bottom and shall be either concentric or eccentric in shape at the top and are to be supplied with a minimum of 200mm of grade rings (but not more than 450mm) and made up of as few as possible grade rings.

.7 All manholes are to be installed so that the top of the concrete structure, including grade rings and cover, are level with the finished grade. Sloped rubber grade rings are to be used where required to ensure covers sit flush with the road surface especially on a crowned surface.

.8 All manholes are to be watertight where located in ditch inverts, swales or when they cannot be kept at grade for other reasons. All manholes are to be externally waterproofed with self-adhered SBS rubberized membrane, elastomeric bitumen emulsion or rubberized asphalt emulsion products from bottom of base to the top of all adjuster rings. Bakor Blueskin WP200 or approved equal shall be used for this application, installation to be as per manufacturer’s instructions and shall include primer and all other appurtenances required to complete the work to the satisfaction of the Engineer.

.9 In the case of a failed Vacuum or Water test on a structure, leaks are to be sealed on the interior of the structure using a hydrophobic polyurethane grout, such as HyperFlex by Fernco or approved equal. Only grouting of seems shall be permitted. External piping entering a manhole is to be sealed using a common cement surface grout. Vacuum or Water testing is to be performed without the use of common cement surface grout on the interior of the structure.

.10 All manholes located in remote locations are to be locked at the discretion of the Utility.

2.2 FRAMES AND COVERS

.1 Round catchbasin covers shall be IMP R 11 600 mm diameter not less than 140 kg mass.

.2 Round manhole covers shall be IMP R 10, 600 mm diameter not less than 145 kg mass.

.3 Dome grate covers shall be IMP R-30, 500 mm diameter, not less than 95 kg mass.

.4 All manholes located completely or partially in asphalt or concrete shall be supplied with a C-56M Floating Frame and IMP R-10 cover. Installation of floating frame is to be complete with a 50mm layer of wetted bentonite chips around joint where the two parts overlap to provide a waterproof barrier. Floating frame and cover shall be adjusted such that when set to finished grade that the frame is in the middle of its adjustment range.

2.3 GRADE RINGS

.1 Grade rings 75mm or larger are to be precast reinforced concrete; grade rings less than 75mm must be of recycled rubber as manufactured by Highway Rubber & Safety Inc.

2.4 INFLOW DISH

.1 Manufactured of high-density polyethylene to ASTM D-1248, Class A, Cat. 5.

.2 Dish to be equipped with ventilation valve and corrosion resistant nylon strap for easy removal and reinstallation into manhole frame.

.3 Standard of Acceptance – Cretex Inflow Dish.

.4 Inflow dishes will be provided by Owner.

Part 3 – Execution

3.1 EXCAVATION AND BACKFILL

.1 Excavate and backfill in accordance with Section 31 23 33.

.2 Obtain approval of Engineer before installing manholes and catchbasins.

3.2 INSTALLATION

.1 Construct units in accordance with details indicated, plumb and true to alignment and grade.

.2 Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.

.3 Pump excavation free of standing water and remove soft and foreign material before placing concrete base.

.4 Cast bottom slabs directly on undisturbed ground or when permitted by Engineer, set precast concrete base on 150mm minimum of well compacted granular material.

.5 For precast units:

.1 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.

.6 For sewers:

.1 Place stub outlets and bulkheads at elevations and in positions indicated.

.2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times diameter of sewer. Slope adjacent floor at 1 on 10. Curve channels smoothly. Slope invert to establish sewer grade.

.7 Place frame and cover on top section to elevation indicated. If adjustment required use concrete ring. Maximum depth of concrete rings allowed is 450mm. Number of rings to be kept to a minimum.

.8 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

3.3 INSTALLATION IN EXISTING SYSTEM

.1 Maintain service or obtain approval for alternate arrangement.

.2 Support existing pipe during installation of base.

3.4 TESTING

.1 Test manholes.

.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 Water Testing: Perform test as follows:

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

.2 Fill with water to top of precast sections.

.3 Allow time for initial absorption.

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

.5 Leakage not to exceed 5.0 litres per hour per metre of height above groundwater, per meter of diameter.

.6 Locate and repair defects if test fails. Retest.

.7 Repair visible leaks regardless of test results.

.6 Vacuum Testing: Perform Test as follows:

.1 Plug all inlet and outlet pipes. Restrain plugs.

.2 Place and seal vacuum tester head on the manhole frame.

.3 Draw vacuum of 250mm (10in) Hg on the manhole and measure the time for the vacuum to drop to 225mm (9in) 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.

.7 Repair visible leaks regardless of test results.

END OF SECTION

Part 1 – General

1.1 RELATED WORK

.1 Section 31 23 33 – Excavation, Trenching, and Backfilling

.2 Section 33 05 16 – Precast Manholes

.3 Section 03 30 00 – Cast-in-Place Concrete

.4 Section 33 31 13 – Pressure Sewers

1.2 SCHEDULING OF WORK

.1 Schedule work to minimize interruptions to existing services.

.2 Maintain existing sewage flows during construction.

.3 Submit schedule of expected interruptions for approval and adhere to approved schedule.

1.3 MEASUREMENT AND PAYMENT

.1 Sewer Main: PVC DR-35 gasketed joints, supplied and installed, shall be measured horizontally in meters of each size pipe installed. Per meter price shall include excavation, backfilling, bypass pumping, compaction, shoring, connection to existing lift station, testing, landscaping and dewatering as required.

.2 Closed circuit television inspection is considered incidental to installation of sanitary sewer mains. All costs of closed-circuit television inspection is to be incorporated into the unit price of each pipe installed.

.3 The Contractor will be required to connect all existing sewer services to the newly installed main. Payment for reconnection of existing services will be based on the per unit price quoted for "Sewer Service Reconnections" in the Schedule of Unit Prices. The per unit price quoted is to include sleeves, tees, bends, 2.0m of DR-35 piping, and miscellaneous items required.

Part 2 – Products

2.1 PIPE

.1 Pipe shall be PVC and shall conform to ASTM Specification D 3034 and be certified by Canadian Standards Association to CSA B182.2 or B182.7.

.2 Minimum pipe wall thickness shall be DR 35.

.3 The following PVC gravity sewer pipes are approved for use:

- .1 IPEX
- .2 Rehau
- .3 Royal Pipe

2.2 PIPE JOINTS

.1 All joints shall be bell and spigot type.

.2 All joints shall use a rubber or other suitable material gasket and it shall be installed in the bell end of the pipe at the factory.

.3 Gaskets for PVC pipe, including laterals and fittings, shall meet or exceed the requirements of ASTM Specification D3212.

.4 Pipe joints must pass a 25 psi (175 kPa) hydrostatic test in the factory laboratory.

.5 A sufficient quantity of joint lubricant shall be supplied with all pipe shipments.

.6 In areas where hydrocarbons are present, Nitrile gaskets must be utilized.

2.3 PIPE FITTINGS

.1 All fittings shall meet or exceed ASTM Standard D3034.

2.4 SEWER COUPLINGS

.1 Sewer pipe repair couplings between similar PVC piping shall be PVC gasketted. Repair couplings approved for use are:

- .1 IPEX
- .2 Multi Fitting
- .3 GPK Fitting
- .4 Royal Pipe

.2 Sewer pipe repair couplings shall be one piece Bibby or Fernco, elastomeric plastic with stainless steel bands or equivalent. Repair couplings approved for use are:

- .1 Fernco
- .2 Bibby
- .3 Pipeconx

.3 Service lateral repair couplings used to connect the new lateral to the existing shall be Mission Standard coupling as follows:

- .1 100mm SDR-28 x 100mm SDR-28: Mission Coupling #MR56-44
- .2 100mm SDR-28 x 100mm Clay: Mission Coupling #MR02-44
- .3 100mm SDR-28 x 100mm Concrete: Mission Coupling #MR06-44
- .4 100mm SDR-28 x 100mm A.C./DI/Non-Corrode: Mission Coupling #MR51-44
- .5 150mm SDR-28 x 150mm SDR-28 & (5” Terra Cotta OD): Mission Coupling #MR56-66
- .6 150mm SDR-28 x 150mm Clay: Mission Coupling #MR02-66
- .7 150mm SDR-28 x 150mm Concrete: Mission Coupling #MR06-66

.4 Fernco and Preper are also acceptable manufacturers.

2.5 SEWER SADDLES

.1 Sewer saddles shall be PVC with 2 stainless steel straps, a rubber gasket to seal to the main and a gasketed bell joint to connect to DR-28 lateral.

.2 PVC Main:

.1 New Main: in-line tee or wye.

.2 Existing Main: PVC strap-on saddle, with gasket, all stainless steel clamps and O-ring on branch end or elastomeric PVC with gasket at main and for service pipe and 2 stainless steel straps.

2.6 UNDERGROUND WARNING TAPE

.1 Warning tape shall be polyethylene with green background and black letters. The message shall be "Caution - Buried Sewer Line Below."

Part 3 – Execution

3.1 PREPARATION

.1 Clean pipes and fittings of debris and water before installation. Inspect materials for defects before installing. Remove defective materials from site.

3.2 TRENCHING AND BACKFILL

.1 Do trenching and backfill work in accordance with Section 31 23 33.

.2 Trench line and depth require approval prior to placing bedding material and pipe.

.3 Do not backfill trenches until pipe grade and alignment have been checked and accepted and infiltration and exfiltration test results are within limits specified.

3.3 BEDDING

.1 Place bedding materials in accordance with Section 31 23 33 or as directed.

.2 Shape bed true to grade and to provide continuous, uniform bearing surface for barrel of pipe. Do not use blocks when bedding pipe.

.3 Shape transverse depressions as required to receive bell if bell and spigot pipe is used.

.4 Compact full width of bed to at least 100% of corrected maximum dry density.

.5 Fill excavation below bottom of specified bedding adjacent to manholes or structures with bedding material or common backfill as directed.

.6 Fill any excavation below level of bottom of specified bedding with approved material and compact.

3.4 INSTALLATION

.1 Lay and join pipes in accordance with manufacturer's recommendations.

.2 Handle pipe with approved equipment. Do not use chains or cables passed through pipe bore so that weight of pipe bears upon pipe ends.

.3 Lay pipes on prepared bed, true to line and grade, with pipe invert smooth and free of sags or high points. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

.4 Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

.5 Do not exceed maximum joint deflection recommended by pipe manufacturer.

.6 Do not allow water to flow through pipe during construction, except as may be permitted by Engineer.

.7 Whenever work is suspended, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

.8 Position and join pipes by approved methods. Do not use excavating equipment to force pipe sections together.

.9 Install PVC pipe and fittings in accordance with CSA B182.11.

.10 Pipe Jointing:

- .1 Install gaskets in accordance with manufacturer's recommendations.
- .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
- .3 Align pipes carefully before joining.
- .4 Maintain pipe joints free from mud, silt, gravel and other foreign material.
- .5 Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned and lubricated and replaced before joining is attempted.
- .6 Complete each joint before laying next length of pipe.
- .7 Minimize joint deflection after joint has been made to avoid joint damage.
- .8 At rigid structures, install pipe joints not more than 1.0 m from side of structure.
- .9 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.

.11 Block pipes as directed when any stoppage of work occurs to prevent creep during down time.

.12 Plug lifting holes with approved pre-fabricated plugs set in non-shrink grout.

.13 Cut pipes as required for special inserts, fittings or closure pieces in a neat manner, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave a smooth end at right angles to axis of pipe.

.14 Make watertight connections to manholes. Use non-shrink grout when suitable gaskets are not available.

.15 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes. Joint of saddle to pipe shall be structurally sound and watertight.

.16 Upon completion of pipe laying and after Engineer has inspected pipe joints, place specified bedding material to dimensions indicated or directed and in accordance with Section 31 23 33.

.17 Backfill remainder of the trench in accordance with Section 33 23 33.

.18 Place underground warning tape 1.0 meter directly above sewer main.

3.5 SERVICE CONNECTIONS

.1 Install pipe to manufacturer's standard instructions and specifications.

.2 Maintain grade for all services at 2% unless directed otherwise.

.3 All sewer services are to be reconnected to the sewer main as detailed on drawings. Tees must be utilized.

.4 Service connection pipe shall not extend into interior of main sewer.

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

.6 Plug service laterals with watertight caps or plugs as approved.

.7 Place wooden marker (50mm x 100mm) at ends of plugged or capped unconnected sewer lines. Each marker shall consist of a stake extending from pipe end at pipe level to 600mm above grade. Paint exposed portion of stake red. Wooden marker to be accompanied with 300mm length of 10M rebar driven down just below finished grade at location of marker.

3.6 FIELD TESTING

.1 Repair or replace pipe, pipe joint or bedding found defective.

.2 Remove foreign material from sewers and related appurtenances by flushing with water and a hydro vac prior to field testing.

.3 Perform exfiltration testing as soon as practicable after jointing and bedding are complete, and service connections have been installed.

.4 Do exfiltration testing as directed. Perform tests in presence of Engineer. Notify Engineer 24 hours in advance of proposed tests.

.5 Carry out tests on each section of sewer between successive manholes including service connections.

.6 Install watertight bulkheads in suitable manner to isolate test section from rest of pipeline.

.7 Exfiltration test:

.1 Fill test section with water in such a manner as to allow displacement of air in line. Maintain under nominal head for 24 hours to ensure absorption in pipe wall is complete before test measurements are commenced.

.2 Immediately prior to test period add water to pipeline until there is a head of 3.0 m over interior crown of pipe measured at highest point of test section or water in manhole is 3.0 m above static ground water level, whichever is greater. Do not exceed a net internal head of 8.0 m.

.3 Duration of exfiltration test shall be two hours.

.4 Water loss at end of test period shall not exceed maximum allowable exfiltration over any section of pipe between manholes.

.8 Leakage shall not exceed following limits in gallons per hour per inch of diameter per 100 meters of sewer including service connections:

.1 Exfiltration, based on 3.0 m of head, 0.50 liters per hour per 25 mm.

.9 Repair and retest sewer line as required, until test results are within limits specified.

.10 Repair visible leaks regardless of test results.

.11 Low Pressure Air Testing:

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 600 MM.

.1 Provide air testing equipment meeting the following requirements:

.1 Air Blower: 14 liters/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 (10.0 psi) with accuracy +/- 0.25 kPa (0.04 psi).

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

.3 Fill test section slowly until a constant pressure of 28 kPa (4.0 psi) is reached. If ground water is above section being tested, Engineer may recommend increase in air pressure.

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

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

.6 Decrease pressure to 24 kPa (3.5 psi). Measure time required for pressure to reach 17 kPa (2.5 psi). Minimum time allowed for pressure drop is as follows:

Pipe Diameter (mm)	Minimum Time Min: Sec
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

.7 Locate and repair defects if test fails. Retest.

.8 Repair visible leaks regardless of test results.

3.7 DEFLECTION TESTING

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

.2 Provide deflection gauges to measure a 5% deflection. Gauges to be a "Go-No-Go" device similar to Standard Mandrel Detail.

.3 Within 30 days after installation, pull a deflection gauge measuring 5% deflection through the installed section of pipeline. Correct any deflection exceeding 5%. Re-test required one (1) month after Substantial Completion.

3.8 CLOSED CIRCUIT TELEVISION INSPECTION

.1 Equipment:

.1 Provide equipment meeting the following Inspection requirements:

.1 Self-contained monitoring unit and camera with remotely controlled lighting system capable of varying the illumination.

.2 Positioning of the camera within the pipe must be such that if water is present, the camera will remain above the water surface.

.3 Picture quality shall product continuous 600 line resolution picture, showing entire periphery of pipe.

.4 A meter device with readings above ground or marking on cable to clearly identify exact location of camera.

.2 Definition of Fault:

.1 Any pipe joint which displays a gap or spread, offset, gasket, or signs of illumination.

.2 Any street lateral which displays water infiltrating around service connection, or a steady flow through street lateral.

.3 Any street exhibiting pronounced protrusion into the main.

.4 Any section of pipe which is crushed, broken or displays cracks.

.5 Any variance in grade of main section.

.6 Any gravel, roots, or foreign material which may impede flow.

.7 Any deformation in shape of pipe.

.3 Inspection:

.1 Perform inspection of pipe from manhole to manhole by passing TV camera through pipe in direction of flow, following flushing of the pipe.

.2 Any fault, or suspected fault, must be reported to the Engineer immediately, along with video for review.

.4 Records:

.1 Maintain inspection record in log form, during television inspection.

.2 Log to include location of each fault and street service lateral distance measured from centerline of reference manhole and position referenced to axis of pipe.

.3 Photograph fault from the television screen using a 35mm camera. 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 photographs for each main section televised, detailing typical joint, and typical building service lateral.

.5 Reports:

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

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

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

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

.3 Report on each main section to contain:

.1 Heading:

.1 Street name.

.2 Manhole or catchbasins 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. (ie., dry, damp, wet, frozen.)

.6 Date of inspection.

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

.3 Inspection findings for each main section to include:

.1 Location of all faults.

.2 Photographs of all faults.

.3 Location of all street service laterals.

.4 One photograph each of typical joint and typical when laterals faults are not found.

.4 Mount 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 the following limits of fault location:

.1 Up to 375 mm pipe: +/- 75 mm per 100 m of length.

.2 450 mm - 600 mm pipe: +/- 150 mm per 100 m of length.

.3 750 mm - 900 mm pipe: +/- 225 mm per 100 m of length.

.7 USB Stick:

.1 Supply a complete record of all inspections on USB Stick.

.2 Index all USB sticks, listing sections of inspections.

.3 Submit USB sticks with written reports to Engineer.

.8 Repeat Inspection:

.1 Repair faults detected during television inspection. Repeat television inspection at no cost to the Owner.

.9 Submission Requirements:

.1 Closed Circuit Television Inspection is to be performed prior to obtaining Substantial Completion. The Stratford Utility Corporation will also require a subsequent Closed Circuit Television Inspection be completed 11 months after Substantial Completion has been awarded. If a fault is identified in either inspection the section of sanitary sewer is to be repaired at the Contractor's expense and the Contractor will be required to re-perform the video inspection to satisfy the Engineer and the Stratford Utility Corporation with the repair.

END OF SECTION

Part 1 – General

1.1 WORK INCLUDED

.1 This section specifies requirements for supply and constructing storm drainage system and culverts. Work includes supply and installation of pipe, fittings and connections.

1.2 CERTIFICATES

.1 Submit manufacturer's test data and certification that products and materials meet requirements of this section.

.2 All materials must be new.

1.3 HANDLING AND STORAGE

.1 Handle and store pipe and fittings in such manner as to avoid shock and 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.

1.4 MEASUREMENT AND PAYMENT

.1 Storm Main Removal & Replacement will be measured horizontally in meters of storm main installed for each size of main which is replaced. All new storm main installed is to provide positive drainage; any storm main installed with negative drainage will require removal/reinstatement to the Owner’s Representative’s satisfaction at the Contractor’s expense.

.2 There shall be no separate payment for shoring and reinstatement required to carry out the work.

Part 2 – Products

2.1 GENERAL

.1 Diameter, material, strength class and dimensional ratio of pipe and fittings: as indicated.

2.2 CONCRETE PIPE AND FITTINGS

.1 Pipe and Fittings:

.1 Non-reinforced: to ASTM C 76M or CAN/CSA A257.1.

.2 Reinforced: to ASTM C 76M or CAN/CSA A257.2.

.2 Joints: bell and spigot with flexible rubber gaskets to CAN/CSA A257.3-M.

2.3 PLASTIC PIPE AND FITTINGS

.1 Type PSM Polyvinyl Chloride: to CAN/CSA B1800.

.2 Profile PVC sewer pipe and fittings: to CAN/CSA B1800, profile as indicated in project documents.

.3 Joints: bell and spigot with locked-in rubber gasket.

2.4 HDPE PIPE AND FITTINGS

.1 Double walled HDPE: to CAN/CSA B1800 with smooth interior surfaces.

.2 Fittings: bell and spigot as indicated.

2.5 UNDERGROUND WARNING TAPE

.1 Warning tape shall be polyethylene with a message approved by the Engineer.

Part 3 – Execution

3.1 PREPARATION

.1 Carefully inspect products for defects and remove defective products from site.

.2 Ensure that pipe and fittings are clean before installation.

3.2 TRENCHING, BEDDING AND BACKFILLING

.1 Do trenching, bedding and backfilling to Section 31 23 33.

3.3 PIPE INSTALLATION

.1 Lay and joint 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 the following tolerances:

.1 Horizontal Alignment: 25 mm.

.2 Vertical Alignment: the lesser of 3mm or one half the rise per pipe length.

.3 Commence laying at outlet and proceed in upstream direction with bell ends facing upgrade.

.4 Prevent entry of bedding material, water or other foreign matter into pipe. Use temporary watertight bulkheads when pipe laying is not in progress.

.5 Install gaskets in accordance with manufacturers published instructions. During cold weather, store gaskets in heated area to assure flexibility.

.6 Align pipe carefully before joining. Do not use excessive force to joint pipe sections.

.7 Support pipes as required to assure concentricity until joint is properly completed.

.8 Keep pipe joints free from mud, silt, gravel or other foreign material.

.9 Avoid displacing gasket or contaminating with dirt, petroleum products or other foreign material. Remove, clean, reinstall and lubricate gaskets so disturbed.

.10 Complete each joint before laying next length of pipe.

.11 Where deflection at joints is permitted, deflect only after the joint is completed. Do not exceed maximum joint deflection recommended by pipe manufacturer.

.12 At structures provide flexible joint not more than 300 mm from outside face of structure.

.13 Cut pipe as required for fittings or closure pieces, square to centerline, and as recommended by manufacturer.

.14 Make watertight connections to manholes and catch basins. Use non shrink grout when suitable gaskets are not available.

.15 Place underground warning tape 1.0 meter directly above storm main. Where main is shallow, the minimum cover over the tape shall be 500 mm.

END OF SECTION