SMITHERS

INVITATION TO TENDER:

2026 SEWER FLUSHING AND VIDEO INSPECTION

For the
Town of Smithers

RFP Number: DevServ2026-02

Request Issue Date: Monday, January 19th, 2026
Closing Date: 2:00 pm, Thursday, February 5, 2026

Contact Person:
Trent Schibli
Sr. Engineering Technologist
Email: tschibli@smithers.ca
1027 Aldous Street, PO Box 879, Smithers, BC V0J 2N0

Documents are distributed through the BC BID platform (https://new.bcbid.gov.bc.ca/), and through the Town of Smithers. There is no requirement for interested proponents to be pre-authorized or to register with BC Bid. However, registration with the BC Bid system is recommended to ensure receipt of amendments.

Owner: TOWN OF SMITHERS
(NAME OF OWNER)

Contract: SEWER FLUSHING AND VIDEO INSPECTION
(TITLE OF CONTRACT)

Reference No. 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

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Documents not supplied are available in: *Master Municipal Construction Documents 2019 Edition, Volume II, 2019. See Instructions to Tenders, Part 1, Section 4.1 S for details.*

INVITATION TO TENDERERS

Owner: Town of Smithers
(NAME OF OWNER)

Contract: Sewer Flushing and Video Inspection
(TITLE OF CONTRACT)

Reference No. DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

The Owner invites tenders for: The Town of Smithers invites tenders for the following work:
Flushing and video inspection of roughly 3,400 meters sewer main within the Town of Smithers.

Contract Documents **are available during normal business hours at:** Electronic contract documents may be downloaded from the BC Bid website.

Alternatively, a hard copy may be obtained at:

Town of Smithers Municipal Office
Box 879, 1027 Aldous Street,
Smithers, BC V0J 2N0

No charge for the first copy, $50.00 per subsequent copy.

The *Contract Documents* are available *for* viewing at:
Town of Smithers Municipal Office
Box 879, 1027 Aldous Street,
Smithers, BC V0J 2N0

Tenders are scheduled to close:

Tender Closing Time: ***2:00pm Local Time***

Tender Closing Date: ***February 5th, 2026***

Submission Address: Town of Smithers
Box 879, 1027 Aldous Street
Smithers, BC V0J 2N0

NAME OF *OWNER'S* REPRESENTATIVE: Mark Allen, P. Eng., Director of Development Services
Office: (250) 847-1600

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(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

**(TO BE READ WITH "INSTRUCTIONS TO TENDERERS - PART II"
CONTAINED IN THE EDITION OF THE PUBLICATION
"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS" SPECIFIED IN ARTICLE 2.2 BELOW)**

Owner: Town of Smithers
(NAME OF OWNER)

Contract: Sewer Flushing and Video Inspection
(TITLE OF CONTRACT)

Reference No. DevServ2026-02
(OWNER'S CONTRACT REFERENCE NO.)

1.0 Introduction

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following work:

Flushing and video inspection of roughly 3,400 meters sanitary and storm sewer within the Town of Smithers.

(BRIEF DESCRIPTION OF THE WORK)

1.2 Direct all inquiries regarding the *Contract*, to:

Trent Schibli
Sr. Engineering Technologist
(NAME AND POSITION OF INDIVIDUAL WHO WILL ANSWER INQUIRIES)

Address: Town of Smithers
PO Box 879
1027 Aldous Street
Smithers, BC V0J 2N0

Phone: (250) 847-1600

Fax: n/a

2.0 Tender Documents

2.1 The tender documents which a tenderer should review to prepare a tender consist of all of the *Contract Documents* listed in Schedule 1 entitled "Schedule of Contract Documents". Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* include the drawings listed in Schedule 2 to the Agreement, entitled "List of *Contract Drawings*".

2.2 A portion of the *Contract Documents* are included by reference. **Copies of these documents have not been included with the tender package.** These documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings. They are those contained in the publication entitled "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings". Refer to Schedule 1 to the Agreement or, if not specified in Schedule 1, then the applicable edition shall be the most recent edition as of the date of

the *Tender Closing Date.* All sections of this publication are by reference included in the *Contract Documents*.

2.3 Any additional information made available to tenderers prior to the *Tender Closing Time* by the *Owner* or representative of the *Owner,* such as geotechnical reports or as-built plans, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of tenderers who must make their own judgment about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

3.0 Submission of Tenders

3.1 Tenders must be submitted in a sealed envelope, marked on the outside with the above *Contract* Title and Reference No., and must be received by the office of:

Mark Allen, P.Eng.
Director of Development Services

(TITLE OF POSITION)

on or before:

Tender Closing Time: **2:00 pm** **local time**
Tender Closing Date: **February 5, 2026**

at Town of Smithers

Address: PO Box 879
1027 Aldous Street
Smithers, BC V0J 2N0

Fax: n/a

3.2 Late tenders will not be accepted or considered and will be returned unopened.

4.0 Supplemental Instructions to Tenderers

4.1 The deadline to submit inquiries is **January 30th, 2026 (12:00pm)**

4.2 The Following Amendments Refer to Instructions to Tenderers – Part 1.

3.1 S **Add** the following clause to the end of the first paragraph:

"The declaration form included in the tender package must be completed, signed by the bidder, and attached to the outside of the submission envelope. Where only one Tender submission is received for a project, it shall not be opened without the written consent of the Contractor, on the understanding that if such Tender submission is in excess of the estimated budget for this project, it may be retendered for better response without any changes being made to the Tender Documents. The Declaration Form that the Tenderer is required to sign and attach to the outside of the envelope shall be considered the Contractor's written consent allowing the Town to open a submission package when it is the only one received."

Add the following clause to the end of the section:

"Tenders will be publicly opened at the stated time in the Council Chambers at the Smithers Municipal Office."

4.11 The Following Amendments Refer to Instructions to Tenderers – Part 2.

12.1 S Amendment of Tenders:

Change "by hand, mail, or fax" **to** "by hand, mail, or email to the contact person identified in paragraph 1.2 of the Instructions to Tenderers – Part I"

4.12 The Following Amendments Refer to the Form of Tender.

5.1.1 **ADD:**

Should the successful Tenderer prefer, the Performance Bond may be waived, and in its place the Owner will retain, until Substantial Performance of the Contract, the Tender Security in the amount of 10% of the Contract Price, but only if it is in the form of a certified cheque, cash, or irrevocable letter of credit acceptable to the Town.
documents, the Contract Security shall be in the amount of ten percent (10%) of the Contract Price on the Form of Agreement. Revisions to the Contract Security shall be amended and received by the Owner prior to executing the Contract."

FORM OF TENDER

FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT - TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.

Owner: Town of Smithers
(NAME OF OWNER)

Contract: Sewer Flushing and Video Inspection
(TITLE OF CONTRACT)

Reference No.: DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

To *Owner*:

WE, THE UNDERSIGNED:

1.1 have received and carefully reviewed all of the *Contract Documents*, including the Instructions to Tenderers, the specified edition of the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" and the following Addenda:

_____

_____

_____ ;
(ADDENDA, IF ANY)

1.2 have full knowledge of the *Place of the Work*, and the *Work* required; and

1.3 have complied with the Instructions to Tenderers; and

ACCORDINGLY WE HEREBY OFFER

2.1 to perform and complete all of the *Work* and to provide all the labour, equipment, and material all as set out in the *Contract Documents*, in strict compliance with the *Contract Documents*; and

2.2 to achieve Substantial Performance of the Work on or before **July 30th, 2026 .**
(WORK DURATION OR DATE)

2.3 to do the *Work* for the price, which is the sum of the products of the actual quantities incorporated into the *Work* and the appropriate unit prices set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices*, and excludes *GST*.

WE CONFIRM: 3.1 that we understand and agree that the quantities as listed in the *Schedule of Quantities and Prices* are estimated, and that the actual quantities will vary.

WE CONFIRM: 4.1 that the following appendices are attached to and form a part of this tender:

4.1.1 the appendices as required by paragraph 5.3 of the Instructions to Tenderers – Part II; and

4.1.2 the *Bid Security* as required by paragraph 5.2 of the Instructions to Tenderers – Part II.

WE AGREE: 5.1 that this tender will be irrevocable and open for acceptance by the *Owner* for a period of **60 calendar days** from the day following the *Tender Closing Date and Time*, even if the tender of another tenderer is accepted by the *Owner*. If within this period the *Owner* delivers a written notice ("*Notice of Award*") by which the *Owner* accepts our tender we will:

5.1.1 within 15 *Days* of receipt of the written *Notice of Award* deliver to the *Owner*:

.1 a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract Price, covering the performance of the Work including the Contractor's obligations during the Maintenance Period, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the Owner;

.2 a Baseline Construction Schedule, as provided by GC 4.6.1;

.3 a "clearance letter" indicating that the tenderer is in Worksafe BC compliance; and

.4 a copy of the insurance policies as specified in GC 24 indicating that all such insurance coverage is in place and;

5.1.2 within 2 *Days* of receipt of written "*Notice to Proceed*", or such longer time as may be otherwise specified in the *Notice to Proceed*, commence the *Work*; and

5.1.3 sign the Contract Documents as required by GC 2.1.2.

WE AGREE: 6.1 that, if we receive written *Notice of Award* of this *Contract* and, contrary to paragraph 5 of this Form of Tender, we:

6.1.1 fail or refuse to deliver the documents as specified by

paragraph 5.1.1 of this Form of Tender; or

6.1.2 fail or refuse to commence the *Work* as required by the *Notice to Proceed*,

then such failure or refusal will be deemed to be a refusal by us to enter into the *Contract* and the *Owner* may, on written notice to us, award the *Contract* to another party. We further agree that, as full compensation on account of damages suffered by the *Owner* because of such failure or refusal, the *Bid Security* shall be forfeited to the *Owner*, in an amount equal to the lesser of:

6.1.3 the face value of the *Bid Security*; and

6.1.4 the amount by which our *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the *Work*.

OUR ADDRESS IS AS FOLLOWS:

_____

_____

_____

Phone: _____

Fax: _____

Attention: _____

This Tender is executed this

_____ day of _____, 20 _____.

Contractor:

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

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FORM OF TENDER - APPENDIX 1
Schedule of Quantities and Prices

This is a unit price contract.
See paragraph 5.3.1 of the Instructions to Tenderers – Part II
All prices and *Quotations* including the *Contract Price* shall not include GST.

Item No.	Spec.	Specification Title	Unit	Quantity	Unit Price	Amount
Sanitary Sewer						
1	33 01 30.1	**CCTV Pipeline Inspection - Sanitary Sewer**	l.m.	2,521		
2	33 01 30.2	**Sewer Cleaning - Sanitary Sewer**	l.m.	2,521		
Storm Sewer						
3	33 01 30.1	**CCTV Pipeline Inspection - Storm Sewer**	l.m.	813		
4	33 01 30.2	**Sewer Cleaning - Storm Sewer**	l.m.	813		
				TOTAL (excluding GST):		

note: l.m. = lineal meters.

Signature of Tenderer

APPENDIX 2 – PRELIMINARY CONSTRUCTION SCHEDULE

Owner: TOWN OF SMITHERS
(NAME OF OWNER)

Contract: SEWER FLUSHING AND VIDEO INSPECTION
(TITLE OF CONTRACT)

Reference No. DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

See paragraph 5.3.2 of the Instructions to Tenderers – Part II.

Indicate Schedule with bar chart with major item descriptions and time.

MILESTONE DATES: SUBSTANTIAL COMPLETION BY MAY 30st, 2026.

ACTIVITY	CONSTRUCTION SCHEDULE (weeks)															
	Mar. wk. 4	Apr. wk. 1	Apr. wk. 2	Apr. wk. 3	Apr. wk. 4	May wk. 1	May wk. 2	May wk. 3	May wk. 4	June wk. 1	June wk. 2	June wk. 3	June wk. 4			
San sewer flushing																
San sewer video inspection																
Storm sewer video inspection																
Storm sewer flushing (if required)																
Deliver Final Documents																

Tenderer's Initials _____

APPENDIX 3 – EXPERIENCE OF SUPERINTENDENT

Owner: TOWN OF SMITHERS
(NAME OF OWNER)

Contract: SEWER FLUSHING AND VIDEO INSPECTION
(TITLE OF CONTRACT)

Reference No. DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.

See paragraph 5.3.3 of the Instructions to Tenderers – Part II.

Name: _____

Experience:

Dates: _____
Project Name: _____
Responsibility: _____

_____

Reference: _____

_____

Dates: _____
Project Name: _____
Responsibility: _____

_____

Reference: _____

Dates: _____
Project Name: _____
Responsibility: _____

_____

Reference: _____

_____

Tenderer's Initials _____

APPENDIX 4 – COMPARABLE WORK EXPERIENCE

Owner: TOWN OF SMITHERS
(NAME OF OWNER)

Contract: SEWER FLUSHING AND VIDEO INSPECTION
(TITLE OF CONTRACT)

Reference No. DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

See paragraph 5.3.4 of the Instructions to Tenderers – Part II.

PROJECT	OWNER / CONTACT NAME PHONE and FAX	WORK DESCRIPTION	VALUE ($)
	Owner / Contract _____ Phone ( ) _____ Fax ( ) _____		
	Owner / Contract _____ Phone ( ) _____ Fax ( ) _____		
	Owner / Contract _____ Phone ( ) _____ Fax ( ) _____		
	Owner / Contract _____ Phone ( ) _____ Fax ( ) _____		

APPENDIX 5 - SUBCONTRACTORS

Owner: TOWN OF SMITHERS
(NAME OF OWNER)

Contract: SEWER FLUSHING AND VIDEO INSPECTION
(TITLE OF CONTRACT)

Reference No. DevServ 2026-02
(OWNER'S CONTRACT REFERENCE NO.)

See paragraph 5.3.5 of the Instructions to Tenderers – Part II.

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER

Tenderer's Initials _____

DECLARATION
SEWER FLUSHING AND VIDEO INSPECTION #2026-02

NAME OF TENDERER: _____

DATE: _____

THIS DECLARATION SHALL BE SIGNED BY THE TENDERER and shall apply in the event only one tender is received.

If only one Tender is received for this project, it must be clearly understood and agreed by the Tenderer concerned that, if such Tender is in excess of the estimated Budget for this Tender, it may be re-tendered for better response without any changes being made to the Tender Documents.

I UNDERSTAND AND AGREE to this Condition.
I AUTHORIZE the opening of my Bid.

_____

I DO NOT AGREE to this condition and wish to withdraw my Bid In the event only one Tender is received.

_____

ATTACH TO OUTSIDE OF TENDER ENVELOPE

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(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

BETWEEN *OWNER* AND *CONTRACTOR*

This agreement made in duplicate this

_____ day of _____, 2026.

Contract: **SEWER FLUSHING AND VIDEO INSPECTION**
(TITLE OF CONTRACT)

Reference No. **DevServ 2026-02**
(OWNER'S CONTRACT REFERENCE NO.)

BETWEEN:

TOWN OF SMITHERS
PO Box 879
Smithers, BC V0J 2N0

Attention: Mark Allen, P. Eng., Director, Development Services

(NAME OF OWNER)

(the "*Owner*")

AND:

_____

_____

_____
(NAME AND OFFICE ADDRESS OF CONTRACTOR)

(the "*Contractor*")

The *Owner* and the *Contractor* agree as follows:

Article 1 The Work Start / Completion Dates

1.1 The *Contractor* will perform all *Work* and provide all labour, equipment and material and do all things strictly as required by the *Contract Documents*.

1.2 The *Contractor* will commence the *Work* in accordance with the *Notice to Proceed*. The *Contractor* will proceed with the *Work* diligently, will perform the *Work* generally in accordance with the construction schedules as required by the *Contract Documents* and will achieve *Substantial Performance* of the *Work* on or before **MAY 30th, 2026** subject to
(INSERT DATE OF SUBSTANTIAL PERFORMANCE)
the provisions of the *Contract Documents* for adjustments to the *Contract Time*.

1.3 Time shall be of the essence of the *Contract.*

Article 2 Contract Documents

2.1 The "*Contract Documents*" consist of the documents listed or referred to in Schedule 1, entitled "Schedule of Contract Documents", which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.

2.2 The *Contract* supersedes all prior negotiations, representations or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents.*

Article 3 Contract Price

3.1 The price for the *Work* ("*Contract Price*") shall be the sum in Canadian dollars of the following

1.1.1 the product of the actual quantities of the items of *Work* listed in the *Schedule of Quantities and Prices* which are incorporated into or made necessary by the *Work* and the unit prices listed in the *Schedule of Quantities and Prices*; plus

1.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or incorporated into the *Work*; plus

1.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents.*

3.2 The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the *Work*.

Article 4 Payment

4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner* shall make payments to the *Contractor*.

4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

Article 5 Rights and Remedies

5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

5.2 Except as specifically set out in the *Contract Documents*, no action or failure to act by the *Owner*, *Contract Administrator* or *Contractor* shall constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

Article 6 Notices

6.1 Communications among the *Owner*, the *Contract Administrator* and the *Contractor*, including all written notices required by the *Contract Documents*, may be delivered by hand, or by email, or by pre-paid registered mail to the addresses as set out below:

The *Owner*:

Town of Smithers
PO Box 879
1027 Aldous Street
Smithers, BC V0J 2N0

Email: **mallen@smithers.ca**

Attention: **Mark Allen, P. Eng., Director of Development Services**

The *Contractor*:

_____

_____

_____

Email: _____

Attention: _____

The *Contract Administrator*:

Town of Smithers
PO Box 879
1027 Aldous Street
Smithers, BC V0J 2N0

Email: **tschibli@smithers.ca**

Attention: **Trent Schibli, AScT, CAPM, Sr. Engineering Technologist**

6.2 A communication or notice that is addressed as above shall be considered to have been received

1.1.4 immediately upon delivery, if delivered by hand; or

1.1.5 immediately upon transmission if sent by fax and received in hard copy; or

1.1.6 after 5 *Days* from date of posting if sent by registered mail.

6.3 The *Owner* or the *Contractor* may, at any time, change its address

for notice by giving written notice to the other at the address then applicable. Similarly if the *Contract Administrator* changes its address for notice then the *Owner* will give or cause to be given written notice to the *Contractor.*

6.4 The sender of a notice by fax assumes all risk that the fax is received in hard copy.

Article 7 General

7.1 This *Contract* shall be construed according to the laws of British Columbia.

7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.

7.3 The headings included in the *Contract Documents* are for convenience only and do not form part of this *Contract* and will not be used to interpret, define or limit the scope or intent of this *Contract* or any of the provisions of the *Contract Documents*.

7.4 A word in the *Contract Documents* in the singular includes the plural and, in each case, vice versa.

7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

Contractor:

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Owner:

TOWN OF SMITHERS
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Schedule 1 Schedule of Contract Documents

The following is an exact and complete list of the *Contract Documents*, as referred to in Article 2.1 of the Agreement.

***NOTE*:** The documents noted with "*" are contained in the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings", edition dated 2019. All sections of this publication are included in the *Contract Documents*.

8.1 Agreement, including all Schedules;
8.2 Supplementary General Conditions
8.3 Supplementary General Conditions
- G.C. 4.2.2(S)
- G.C. 18.1.1(S)

8.4 Supplementary Specifications (if any, insert title and edition date);
- 5.0 Storm Sewers
- 6.0 Sanitary Sewers

8.5 Specifications*;
8.6 Supplementary Standard Detail Drawings
- none

8.7 Standard Detail Drawings*;

8.8 Executed Form of Tender, including all Appendices;
8.9 *Contract Documents* listed in Schedule 2 to the Agreement –"List of *Contract Documents*";
8.10 Instructions To Tenderers - Part I;
8.11 Instructions to Tenderers - Part II*;
8.12 MMCD Supplemental Updates:
- 2025-11-13
- 2025-04-18
- 2024-05-23
- 2022-04-07
- 2021-04-23

8.13 The following Addenda:

_____

_____

(ADDENDA, IF ANY)

Schedule 2 List of Contract Drawings

TITLE	DRAWING NO.	DATE	REVISION NO.	REVISION DATE
Cover Page	Sheet 0	2026-01-16	IFU 0	n/a
Overview of Proposed Sewer Segments	Sheet 1	2026-01-16	IFU 0	n/a
Sanitary Sewer Details	Sheet 2	2026-01-16	IFU 0	n/a
Sanitary Sewer Details	Sheet 3	2026-01-16	IFU 0	n/a
Storm Sewer Details	Sheet 4	2026-01-16	IFU 0	n/a
Lists in Excel Format	Sheet 5	2026-01-16	IFU 0	n/a

SUPPLEMENTARY GENERAL CONDITIONS TO THE MMCD VOLUME II (2019 EDITION)
Specific to the Town of Smithers, Contract DevServ 2026-02 Sewer Flushing and Video Inspection

G.C. 4.2.2. (S) **Insert** Clause:

"Written Safety Policy: The Contractor shall submit a copy of their written Safety Policy prior to mobilizing on site. A written policy is valid for the calendar year in which the works are scheduled to commence. If the Contractor has previously submitted their Safety Policy, the Contractor shall provide written notice indicating this.

G.C. 18.1.1(S) **Replace** Clause as follows:

Replace: "Within 5 days after the end of a calendar month, the Contract Administrator shall prepare and issue a certificate (the "Payment Certificate") for the period ending the last calendar day of the month."

With: "At the end of each calendar month, the Contractor shall submit a written request for payment to the Contract Administrator. The application shall include a copy of the schedule of quantities indicating completed work and any documentation required to support the claimed quantities.

Within 10 days of receipt of the required information, the Contract Administrator shall prepare and issue a certificate (The "Payment Certificate") for the period ending the last calendar day of the month.".

SPECIFICATION NO. 5.0
STORM SEWERS

INDEX

5.1 MATERIALS

The owner may retain the services of an independent testing company, to provide test reports in accordance with accepted industry standards on all materials being used for the job. Materials failing to meet the requirements of the standard specifications and Standard Drawings shall be rejected at the contractor's cost.

5.2 PIPE AND FITTINGS

Type, size and materials of pipes and fittings must conform to requirements of Standard Drawings and construction drawings. Pipe specifications may change with pipe grade, depth of pipe or other requirements. All pipe used for gravity sewer systems shall be PVC (Poly Vinyl Chloride) SDR 35, unless specified differently. PVC SDR 35 pipe shall conform to ASTM D3034.

If non-reinforced concrete pipe and fittings are specified for installation, the pipe material shall conform to ASTM C14.

If reinforced concrete pipe and materials are specified for installation, the pipe material shall conform to ASTM C76.

CMP pipe and fittings shall be manufactured of corrugated, galvanized metal and fully asphalt coated with paved pipe invert. Areas of pipe, which show exposed metal due to damage, shall be recoated with an approved asphalt emulsion. All pipe material shall meet ASTM A444 Standards.

5.3 JOINING SYSTEM

Elastomeric gasket joints providing a watertight seal shall be used to join individual pipe sections and fittings. Joints shall show no signs of leakage when tested in accordance with ASTM D3034.

CMP pipe shall be jointed according to manufacturer's specifications, leakage requirements shall be waived.

5.4 BEDDING MATERIAL

Bedding chips, consisting of rock not larger than 13 mm diameter maximum, free of fines shall be used in wet, bottomless trenches. Crushed gravel, 19 mm diameter minus, shall be used in standard construction. The Engineer will specify and approve the required bedding materials according to existing soils conditions and pipe material used.

5.5 SELECT BACKFILL FOR PIPE ZONE

The entire width of the trench, from the top of the pipe bedding at pipe spring line, to 300 mm above the top of pipe, must be backfilled using selected, dry soils. The soils must be well graded and free of rocks larger than 30 mm diameter. They shall not contain frozen soil, nor roots or other objectionable material that might cause pipe damage, excessive settlement or inadequate compaction.

WORKMANSHIP

5.6 CONSTRUCTION PROCEDURES

Utility trenches shall be excavated as shown in the Standard Drawings. Bedding material shall be placed to grade and compacted to the satisfaction of the Engineer prior to the pipe installation. The bedding material shall cover the full width of the trench bottom and have a minimum thickness of 100 mm. 150 mm thickness shall be used in rock excavation or trenches with rough, rocky trench bottoms.

Bedding to be excavated under bell ends of pipe to provide continuous support to pipe.

Requirements for compaction of bedding materials depend on the type of sub-soils, ground water conditions and pipe grade.

5.7 PIPE ALIGNMENT AND GRADE

Each pipe shall be laid with bell upstream to grade within limits of +/- 6 mm maximum of geodetic design elevation. Where pipe grades are below 0.5% slope, the maximum design deviation from the geodetic design elevation shall not exceed 3 mm.

The pipe alignment shall be within +/- 10 mm of a straight line between manholes, which are located according to design.

5.8 PIPE INSTALLATION

Pipes shall be carefully lowered into the trench to prevent material damage and injury to workmen. Any defective, damaged or unsound pipe shall be repaired or replaced. Each pipe shall be jointed in accordance with the manufacturer's installation recommendations. The maximum joint deflection shall be the maximum deflection allowed by the manufacturers' recommendations. The pipe shall be set to grade and alignment, and locked in place with bedding material. The contractor shall proceed with the final placement and compaction of the pipe bedding up to the pipe spring line. The selected backfill shall be placed and compacted to 95% standard Proctor density to an elevation of 300 mm above the top of pipe. The shoring, if in place, may be partially pulled. The trench shall be backfilled to keep the open trench length as short as possible.

Ground water problems and safety problems are of major concern at this phase of construction. Where free ground water runs into the excavation, it must not be permitted to collect in the bottom of the trench, but must be continually pumped to maintain as dry a trench as feasible. Compaction requirements shall be assumed to be 95% standard proctor for all backfill work. Pipes must be kept clear of all foreign material during construction and periods of shut down. Approved pipe caps must be used for this purpose.

5.9 CLEANING AND FLUSHING

Upon project completion, sewer pipe shall be cleaned by flushing. If it is necessary to remove foreign material from the pipe and manholes, it shall be done by means of mechanical equipment at the expense of the contractor.

5.10 TESTING AND INSPECTIONS

The contractor shall be responsible for all work relating to control of alignment, grade, quality of construction, leakage and leakage testing of pipe.

Inspections will be carried out by the Engineer. Major survey axes and geodetic elevations for control benchmarks will be supplied by the Engineer upon written request by the contractor.

Leakage testing of pipe shall be carried out by the contractor using approved equipment according to approved testing schedules and testing methods of this Specification.

STORM SEWER MANHOLES

5.11 PRECAST MANHOLE SECTIONS

Except as otherwise provided, manholes shall be of precast concrete manhole sections. Precast manhole sections shall be 1050 mm inside diameter conforming to ASTM C76 for Class II reinforced concrete pipe having a minimum wall thickness of 90 mm.

Cone shaped manhole sections shall be designed to withstand H-20 loading conditions and shall be installed as specified and as shown on the Standard Drawings.

5.12 COVER SLABS

Cover slabs shall be precast concrete. Slabs shall be reinforced to withstand H-20 loading conditions. Openings shall be a minimum diameter of 620 mm and a maximum diameter of 650 mm, and the openings shall be positioned off centre at 200 mm from one edge.

5.13 FRAMES AND COVERS

Covers and frames shall be constructed of cast iron and designed to an approved pattern to withstand H-20 loading. The clear opening of the frame shall be 518 mm diameter. The cover shall have a weight of 61 kg. The frame shall be of the round base pattern having a weight of 108 kg. Bearing faces of the cover to frame shall be machined for a non-rocking fit. Covers shall have only two 22 mm diameter lifting holes with bolt plug assembly as shown on the Standard Drawings.

5.14 STEPS

Steps shall be hot-dip galvanized, 19 mm diameter steel, safety type, as shown on the Standard Drawings. Steps shall be cast in manhole sections by the manufacturer. Aluminium rungs may be approved by Engineer upon submission of specifications for inspection.

5.15 CONCRETE

The compressive field strength of concrete for manhole bases shall be not less than 25 MPa at 28 days.

5.16 RISER RINGS

Riser rings below the cast iron frame shall be of solid, reinforced concrete, so designed for this purpose, having a minimum wall thickness of 100 mm and an inside diameter of 625 mm. Bricks shall not be used as a substitute unless approved by the Engineer. The maximum total rise for grade adjustment shall not exceed 300 mm. Steel riser rings shall only be used for minor 'surface grade adjustments.

WORKMANSHIP

5.17 EXCAVATION AND BACKFILLING

Excavation and backfilling shall be carried out as specified under Specification No. 2 -Trench Excavation.

5.18 PRECAST SECTIONS

Precast sections shall be placed plumb, with joints mortared to exclude any entrance of ground water.

5.19 CONCRETE

Concrete work shall be as specified under Specification No. 9A entitled Concrete.

5.20 FRAMES AND COVERS

Frames shall be set on a concrete riser ring base as shown on the Standard Drawings. It shall be mortared in an approved manner and the inside and outside face of the rings shall be "buttered" with mortar such that a neat, even finish results. Frames shall be firmly embedded in mortar and shall be set to provide a cover surface which is even with and true to the contour of the road.

The contractor shall place the frame and cover without final grade adjustment, if a road surface is not existing, but proposed for construction. The final setting of the frame and cover shall take place just prior to the construction of the "19 mm, minus" crushed gravel road base.

Adjustment for longitudinal street grade and street cross fall must be considered; frame and covers shall be set within +/- 5 mm of geodetic design elevations taking existing curb elevations into account.

5.21 MANHOLE STEPS

Manhole steps shall be placed as shown on the Standard Drawings and as directed by the Engineer, to provide safe access.

When manhole is in travelled portion of the road, manhole steps should be installed in the side of the manhole facing oncoming traffic. Otherwise, manhole steps should be installed on the downstream side.

5.22 MANHOLE BASE AND CHANNELLING

All water shall be removed from the excavations prior to placing base concrete.

If material in the bottom of the trench is unsuitable for support, the bottom shall be over excavated to a firm base, or as determined by the Engineer, and backfilled to the required grade with thoroughly compacted base material, bedding chips or crushed gravel at the Contractors expense.

Manhole bases may be prefabricated or cast on site. The manhole base and channelling shall be constructed as shown on the Standard Drawings.

All pipe material being part of the manhole base shall be Silica coated PVC, SDR35. The use of standard SDR35 PVC pipe may be permitted in conjunction with two approved rubber water stops and shall be encased in concrete according to Standard Drawing C-21-1.

The manhole base with channelling shall be constructed as shown on the Standard Drawings. Channelling shall be formed using half sections of pipe or fittings; or trowel finished concrete poured to a depth equal to the spring line of the pipe. The channelling shall be smooth throughout. PVC pipe walls shall be cut flush and form clean edges with the concrete manhole barrel on the surface of the manhole base.

The first manhole barrel section shall be set into the fresh base concrete to form one solid unit with the base and therefore prevent future infiltration of water. This 300 mm manhole section of a given diameter shall be embedded in 100 mm of base concrete. At this phase of construction the remaining height to the final road grade or finished manhole elevation shall be determined in order to establish the required materials to finish the manhole construction.

Where blind stub sections for connection of future sewers are part of the base construction, an approved watertight pipe cap must be installed.

5.23 GROUND WATER INFILTRATION

Manholes shall be water tight, infiltration or ex filtration shall be zero.

5.24 EXISTING SEWER CONNECTIONS

Connections to existing manholes, main lines or service lines shall be carried out without disturbing their function.

5.25 SEWER SERVICE CONNECTIONS

All services shall be capped or plugged with an approved water tight and air tight cap at the property line and shall be secured to withstand internal system pressures as encountered during leakage testing.

The requirements for pipes and fittings, bedding, construction tolerances and procedures are the same as outlined for sewer mainline construction.

5.26 MARKING OF SERVICES AND RECORDS

A 38 x 90 mm piece of lumber painted green shall be used to mark the end of each storm sewer service. The length shall be 3 metres.

The bottom of the vertically set "Marker" must be installed to match the invert elevation of the storm sewer service.

The contractor shall protect the markers from damage; broken markers shall be replaced at his expense.

Service records, showing exact location and invert elevations, shall be established by the contractor immediately following the service installation.

CATCH BASINS

5.27 PRECAST CATCH BASINS

Catch basins shall be of precast concrete of circular shape and shall conform to ASTM C76, for Class III pipe. Catch basin lids shall be designed to withstand H-20 loading conditions. Dimensions and opening size for lid and concrete base unit shall be as shown in the Standard Drawings.

5.28 CATCH BASIN LEADS

200 mm diameter PVC pipe shall be used for catch basin leads. Pipes shall be trimmed off flush with the inner wall of the catch basin and grouted in place. The Engineer must approve any other materials.

5.29 CATCH BASIN FRAMES AND GRATES

Catch basin frames and grates shall be designed to withstand H-20 loading. Frames and grates shall be in accordance with the dimensions shown on the Standard Drawings.

Frames and grates shall be machined for non-rocking fit and shall be dipped, while hot and clean, in a hot bath of asphaltic tar.

LEAKAGE TESTING OF GRAVITY SEWERS

5.30 LOCATION OF TESTS

Leakage tests shall be performed by the contractor on all storm sewers unless otherwise directed by the Engineer.

5.31 TYPE OF TEST

Test for leakage will be either infiltration or exfiltration tests using water tests. The type of test employed will be determined by the Engineer.

Where the surface level of existing ground water in the backfilled trench is one (1) metre or more above the top of the pipe over the entire test section, an infiltration test may be used to determine leakage to the pipe. Where the ground water surface level is less than one (1) metre above the top of the pipe, or where ground water at the time of testing is not apparent, the contractor shall carry out an ex filtration test using water testing procedures.

The length of each test section and the testing method will be determined by the Engineer.

Storm sewer manholes shall be tested over their entire depth, using the exfiltration method with water. The leakage should not exceed 0.04 litres per hour.

5.32 INFILTRATION TESTING

To carry out an infiltration test, the pipe at the highest point on the test section shall be sealed with a watertight plug. The leakage of water by infiltration shall be measured at the low end of the test section. The pipe at the bottom of the test section shall be sealed with a watertight plug having a drain cock at its centre. The pipe shall be filled with water to an elevation which is equal to the invert of the drain cock of the bottom plug. If infiltration occurs, it will be measured, by draining the amount of water which accumulated during the test period into a standard container of known volume. Only water which built up above the drain cock invert will drain out, representing the infiltration quantities per test period.

The duration of a test will be determined by the Engineer but shall not, unless the test results indicate excess leakage, exceed 8 hours.

5.33 EXFILTRATION TESTING

To carry out an ex filtration test, the test section shall be sealed at its lower extremity by means of a watertight plug. The test section shall be filled with water such that a minimum hydrostatic head of 0.9 metre is placed on the pipe at its upper extremity. The test pressure shall be maintained above the 0.9 metre minimum head for a period of not less than one hour, and unless excess ex filtration requires further testing, not greater than 8 hours. Pressures in excess of 3 metres water head are not recommended.

The amount of leakage is determined at the upper manhole of the test section.

Leakage in litres = (E -Z) x A x 1,000

Where: Z = zero reading of water level elevation inside the manhole in metres, measured to the millimetre from the top of the manhole.

E = end reading of water level elevation inside the manhole in metres, measured to the millimetre from the top of the manhole.

A = area of manhole in square metres.

H = duration in hours to be recorded

5.34 ALLOWABLE LEAKAGE FOR INFILTRATION AND EXFILTRATION TESTING WITH WATER

Gravity sewers, manholes, and appurtenant structures thereon shall be constructed such that leakage, as evidenced by ex filtration or infiltration tests, is less than that calculated using the following formula.

The allowable ex filtration (water method) shall be four (4) litres per millimetre of pipe diameter per kilometre per day.

OR

$$\text{Maximum allowable leakage in litres} = \frac{HDL}{6000}$$

Where: H = duration of tests in hours,

D = inside diameter of the pipe in millimetres, and

L = length of pipe in the test section in metres.

The above leakage limit will constitute the total maximum allowable leakage of any test section of gravity sewer. No additional leakage allowance will be made for manholes existing along the test section.

5.35 FAILURE OF TESTS

The maximum allowable leakage will be that calculated by the listed formulas regardless of whether an ex filtration or an infiltration test is applied and regardless of the test head of water employed. Where a section of sewer or manhole is found to have leakage exceeding the allowable limit, replacement or repairs shall be made to reduce the amount of leakage to or below the allowable limit at the Contractors expense. Repaired sections shall be retested until they meet the allowable leakage limits.

SECTION A

MATERIALS

5A.1 CULVERTS

Culverts shall be galvanized corrugated metal pipe conforming to the requirements of ASTM A444 Standards.

Minimum gauge sizes shall be:

450 diameter and under -16 gauge

525 to 750 diameter -14 gauge

900 diameter and over -12 gauge

5A.2 CONCRETE-FILLED BURLAP BAGS

Burlap bags of 600 x 900 millimetre size shall be filled with concrete of 25 MPa compressive strength in 28 days.

CONSTRUCTION

5A.3 PIPE INSTALLATION

Pipe shall be laid according to Standard Specification No. 5.08 or according to Special Specifications.

5A.4 STREET RECONSTRUCTION

Streets shall be reconstructed according to Standard Specifications.

5A.5 HEAD WALLS

Standard head walls shall be constructed of burlap bags filled with fresh concrete to dimensions as shown:

Minimum Height: from invert to 300 mm above pipe, but high enough to stabilize dirt slopes.

Minimum width: triple the pipe diameter, but for the full width of the natural drainage channel plus 300 mm on each side.

Minimum Thickness: 600 mm solid.

Minimum Angle: twenty (20) degrees off the vertical, leaning towards the road or embankment.

Headwalls for major culverts or alternative designs to standard headwalls shall be engineered or approved by the Engineer.

SECTION B

5B.1 MEASURE AND PAYMENT

The Tendered prices shall be payment in full for the performance of the Work to all specifications contained herein and unless otherwise specified shall include all equipment, labour and materials; the costs of excavating, hauling and stockpiling of excavated material; bedding, backfilling and compacting; supply, delivery, storage and distribution of material; shoring; laying and joining of pipes, fittings and other appurtenances; the handling of storm water; and the protection of the works.

SPECIFICATION NO. 6.0
SANITARY SEWERS

INDEX

6.1 MATERIAL TESTING

The Owner may retain the services of an independent testing company, to provide test reports in accordance with accepted industry standards on all materials being used for the job. Materials failing to meet the requirements of the standard specifications and standard drawings shall be rejected at the contractor's cost.

6.2 PIPE AND FITTINGS

Type, size and material of pipes and fittings must conform to requirements of Standard Drawings and construction drawings. Pipe specification may change with pipe grade, depth of pipe or other requirements. All pipe used for gravity sewer systems shall be PVC (Poly Vinyl Chloride) SDR 35, unless specified differently. PVC SDR 35 pipe shall conform to ASTM D3034.

6.3 JOINING SYSTEM

Elastomeric gasket joints providing a watertight seal shall be used to join individual pipe sections and fittings. Joints shall show no signs of leakage when tested in accordance with ASTM D3034.

6.4 BEDDING MATERIAL

Bedding chips, consisting of rock not larger than 13 mm diameter maximum, free of fines shall be used in wet, bottomless trenches. Crushed gravel, 19 mm diameter minus, shall be used in standard construction.

The Engineer will specify and approve the required bedding materials according to existing soils conditions.

6.5 SELECT BACKFILL FOR PIPE ZONE

The entire width of the trench, from the top of the pipe bedding at pipe springline, to 300 mm above the top of pipe, must be backfilled using selected, dry soils. The soils must be well graded and free of rocks larger than 30 mm diameter. They shall not contain frozen soil, nor roots or other objectionable material that might cause pipe damage, excessive settlement or inadequate compaction.

WORKMANSHIP

6.6 CONSTRUCTION PROCEDURES

Utility trenches shall be excavated as shown in the Standard Drawings. Bedding material shall be placed to grade and compacted to the satisfaction of the Engineer prior to the pipe installation. The bedding material shall cover the full width of the trench bottom and have a minimum thickness of 100 mm. 150 mm thickness shall be used in rock excavation or trenches with rough, rocky trench bottoms. Requirements for compaction of bedding materials depend on the type of sub-soils, ground water conditions and pipe grade.

6.7 PIPE ALIGNMENT AND GRADE

Each pipe shall be laid with bell upstream, to grade within limits of +/- 6 mm of geodetic design elevation. Where pipe grades are below 0.5% slope, the deviation from the geodetic design elevation shall not exceed 3 mm. The pipe alignment shall be within +/- 10 mm of a straight line between manholes, which are located according to design.

6.8 PIPE INSTALLATION

Pipes shall be carefully lowered into the trench to prevent material damage and injury to workmen. Any defective, damaged or unsound pipe shall be repaired or replaced. Each pipe shall be jointed in accordance with the manufacturer's installation recommendations. The maximum joint deflection shall be the maximum allowed by the manufacturer's recommendations. The pipe shall be set to grade and alignment, with bell end upstream, and locked in place with bedding material.

The contractor shall proceed with the final placement and compaction of the pipe bedding up to the pipe spring line. The selected backfill shall be placed and compacted to an elevation of 300 mm above the top of pipe. The shoring, if in place, may be partially pulled. The trench shall be backfilled to keep the open trench length as short as possible.

Ground water problems and safety problems are of major concern at this phase of construction. Where free ground water runs into the excavation, it must not be permitted to collect in the bottom of the trench or run into sanitary sewer, but must be continually pumped to maintain as dry a trench as feasible. Compaction requirements shall be 95% standard proctor for all backfill work unless otherwise specified. Pipe interiors must be kept clear of all foreign material during construction and periods of shut down. Approved pipe caps must be used for this purpose.

6.9 CLEANING AND FLUSHING

Upon project completion, sewer pipe shall be cleaned by flushing. If it is necessary to remove foreign material from the pipe and manholes, it shall be done by means of mechanical equipment at the expense of the contractor.

6.10 TESTING AND INSPECTIONS

The contractor shall be responsible for all work relating to control of alignment, grade, quality of construction, leakage and leakage testing of pipe.

Inspections will be carried out by the Engineer. Major survey axes and geodetic elevations for control benchmarks will be supplied by the Engineer upon written request by the contractor.

Prior to flushing and testing, the Contractor shall clean all new mains of debris by passing a line sized "pig" through the main, or by TV inspection and immediately afterwards the pipe ends are to be capped in preparations to testing. This procedure will help to identify any misalignments on curved mains.

All sanitary sewers shall be visually inspected and flushed to determine that they are straight and free of silt, gravel, sand, earth, and other debris.

Leakage testing of pipe shall be carried out by the contractor using approved equipment according to approved testing schedules and testing methods of these specifications.

SEWER MANHOLES

6.11 PRECAST MANHOLE SECTIONS

Except as otherwise specified, manholes shall be of precast concrete manhole sections. Precast manhole sections shall be 1050 mm inside diameter conforming to ASTM C76 for Class II reinforced concrete pipe having a minimum wall thickness of 90 mm.

Cone shaped manhole sections shall be designed to withstand H-20 loading conditions and shall be installed as specified and as shown on the Standard Drawings.

6.12 COVER SLABS

Cover slabs shall be precast concrete. Slabs shall be reinforced to withstand H-20 loading conditions. Openings shall be a minimum diameter of 620 mm and a maximum diameter of 650 mm, and the openings shall be positioned off center at 200 mm from one edge.

6.13 FRAMES AND COVERS

Frames and covers shall be constructed of cast iron and designed to an approved pattern to withstand H-20 loading. The clear opening of the frame shall be 518 mm diameter. The cover shall have a weight of 61 kg. The frame shall be of the round base pattern having a weight of 108 kg. Bearing faces of the cover to frame shall be machined for a non-rocking fit. Covers shall have only two 22 mm diameter lifting holes with bolt plug assembly as shown on the Standard Drawings.

6.14 STEPS

Steps shall be hot-dip galvanized, 19 mm diameter steel, safety type, as shown on the Standard Drawings. Steps shall be cast in manhole sections by the manufacturer. Aluminum rungs may be approved by the Engineer upon submission of specifications for inspection.

6.15 CONCRETE

The compressive field strength of concrete for manhole bases shall be not less than 19 MPa at 28 days.

6.16 RISER RINGS

Riser rings below the cast iron frame shall be of solid, reinforced concrete, so designed for this purpose, having a minimum wall thickness of 100 mm and an inside diameter of 625 mm. Bricks shall not be used as a substitute unless approved by Engineer. The maximum total rise for grade and adjustment shall not exceed 300 mm. Steel riser rings shall only be used for minor surface grade adjustments.

WORKMANSHIP

6.17 EXCAVATION AND BACKFILLING

Excavation and backfilling shall be carried out as specified under Specification No. 2 -Trench Excavation.

6.18 PRECAST SECTIONS

Precast sections shall be placed plumb, with joints mortared to exclude any entrance of ground water.

6.19 CONCRETE

Concrete work shall be as specified under Specification No. 9A entitled Concrete.

6.20 FRAMES AND COVERS

Frames shall be set on a concrete riser ring base as shown on the Standard Drawings. It shall be mortared in an approved manner and the inside and outside face of the rings shall be "buttered" with mortar such that a neat, even finish results. Frames shall be firmly

embedded in mortar and shall be set to provide a cover surface, which is even with and true to the contour of the road surface.

The contractor shall place the frame and cover without final grade adjustment, if a road surface is not existing, but proposed for construction. The final setting of the frame and cover shall take place just prior to the construction of the "19 mm, minus", crushed gravel road base.

Adjustment for longitudinal street grade and street cross fall must be considered; frame and covers shall be set within +/- 5 mm of geodetic design elevations taking existing curb elevations into account.

6.21 MANHOLE STEPS

Manhole steps shall be placed as shown on the Standard Drawings or as directed by the Engineer, to provide safe access.

When the manhole is in the traveled portion of the road, manhole steps should be installed in the side of the manhole facing the oncoming traffic. Otherwise manhole steps should be installed in the downstream side.

6.22 MANHOLE BASE AND CHANNELLING

All water shall be removed from the excavations prior to placing base concrete.

If material in the bottom of the trench is unsuitable for support, the bottom shall be over excavated to a firm base, or as determined by the Engineer, and backfilled to the required grade with thoroughly compacted base material, bedding chips or crushed gravel at the Contractor's expense.

Manhole bases may be prefabricated or cast on site. The manhole base and channeling shall be constructed as shown on the Standard Drawings.

All pipe material being part of the manhole base shall be Silica coated PVC, SDR35. The same applies to the inlet fitting of outside drop structures for sanitary sewer manholes.

The use of standard SDR35 PVC pipe may be permitted in conjunction with two approved rubber water stops and shall be encased in concrete according to Standard Drawing C-21-1.

The manhole base and channeling shall be constructed as shown on the Standard Drawings. Channeling shall be formed using half sections of pipe or fittings; or trowel finished concrete poured to a depth equal to the springline of the pipe. The channeling shall be smooth throughout. PVC pipe walls shall be cut flush and form clean edges with the concrete manhole barrel on the surface of the manhole base.

The first manhole barrel section shall be set into the fresh base concrete to form one solid unit with the base and therefore prevent future infiltration of water. This 300 mm manhole section of a given diameter shall be embedded in 100 mm of base concrete. At this phase of construction the remaining height to the final road grade or finished manhole elevation shall be determined in order to confirm the required materials to finish the manhole construction. The manhole cover shall be set to a grade elevation that is lower than the design road grade, but not by more than 300 mm.

Where blind stub sections for connection of future sewers are part of the base construction, an approved water tight pipe cap must be installed.

6.23 GROUND WATER INFILTRATION

Manholes shall be watertight. Infiltration or exfiltration shall be zero.

6.24 EXISTING SEWER CONNECTIONS

Connections to existing manholes, main lines or service lines shall be carried out without disturbing their function.

6.25 SEWER SERVICE CONNECTIONS

All services shall be capped or plugged with an approved water tight and air tight cap at the property line and shall be secured to withstand internal system pressures as encountered during leakage testing.

The requirements for pipes and fittings, bedding, construction tolerances and procedures are the same as outlined for sewer mainline construction.

6.26 MARKING OF SERVICES AND RECORDS

A 38 x 90 mm piece of lumber, painted red, shall be used to mark the end of each sanitary sewer service. The length shall be 3 meters.

The bottom of the vertically set "Marker" must be installed to match the invert elevation of the sanitary sewer service.

The contractor shall protect the markers from damage; broken markers shall be replaced at his expense.

Service records, showing exact location and invert elevations, shall be established by the contractor immediately following the service installation.

LEAKAGE TESTING OF GRAVITY SEWERS

6.27 LOCATION OF TESTS

Leakage tests shall be performed by the contractor on all sanitary sewers unless otherwise directed by the Engineer.

6.28 TYPE OF TEST

Tests for leakage will be either infiltration or exfiltration tests using water or air tests. The type of test employed will be determined by the Engineer.

Where the surface level of existing ground water in the backfilled trench is one meter or more above the top of the pipe over the entire test section, an infiltration test may be used to determine leakage to the pipe. Where the ground water surface level is less than one meter above the top of the pipe, or where ground water at the time of testing is not apparent, the contractor shall carry out an exfiltration test using water or air testing procedures.

The length of each test section and the testing method will be determined by the Engineer.

Sanitary sewer manholes shall always be tested over their entire depth using the ex filtration method with water.

6.29 INFILTRATION TESTING

To carry out an infiltration test, the pipe at the highest point on the test section shall be sealed with a watertight plug. The leakage of water by infiltration shall be measured at the low end of the test section. The pipe at the bottom of the test section shall be sealed with a watertight plug having a drain cock at its centre. The pipe shall be filled with water to an elevation, which is equal to the invert of the drain cock of the bottom plug. If infiltration occurs, it will be measured, by draining the amount of water, which accumulated during the test period into a standard container of known volume. Only water, which built up above the drain cock invert, will drain out, representing the infiltration quantities per test period.

The duration of a test will be determined by the Engineer but shall not, unless the test results indicate excess leakage, exceed 8 hours.

6.30 EXFILTRATION TESTING

To carry out an exfiltration test, the test section shall be sealed at its lower extremity by means of a watertight plug. The test section shall be filled with water such, that a minimum hydrostatic head of 0.9 meter is placed on the pipe at its upper extremity. The test pressure shall be maintained above the 0.9 meter minimum head for a period of not less than one hour, and unless excess exfiltration requires further testing, not greater than 8 hours. Pressures in excess of 3 meters water head are not recommended.

The amount of leakage is determined at the upper manhole of the test section.

Leakage in liters = (E -Z) x A x 1,000

Where:

Z = zero reading of water level elevation inside the manhole in meters, measured to the millimeter from the top of the manhole.

E = end reading of water level elevation inside the manhole in meters measured to the millimeter from the top of the manhole.

A = area of manhole in square meters.

H = duration in hours to be recorded. The allowable ex filtration (air method) shall be determined by filling the test section with air to a constant pressure of 25 kPa and maintaining a pressure above 20 kPa for a minimum of five (5) minutes. After the stabilization period, the air supply shall be cut off and the pressure allowed to drop to 20 kPa. Timing shall commence at 20 kPa and continue until the pressure reaches 15 kPa. The minimum acceptable time period shall be determined by the formula:

Minimum time in minutes = 0.040 X pipe diameter in mm.

An infiltration test may be required by the Approving Officer in areas of high groundwater.

The Approving Officer shall be notified 24 hours in advance of leakage testing and may elect to witness the test. All test data and leakage calculations are to be submitted to the Approving Officer.

6.31 ALLOWABLE LEAKAGE FOR INFILTRATION AND EX FILTRATION TESTING WITH WATER

Gravity sewers, manholes, and appurtenant structures thereon shall be constructed such that leakage, as evidenced by ex filtration or infiltration tests, is less than that calculated using the following formula.

$$\text{Allowable leakage in liters} = \frac{HDL}{6000}$$

Where:

H = duration of tests in hours

D = inside diameter of the pipe in millimeters

L = length of pipe in the test section in meters.

The above leakage limit will constitute the total maximum allowable leakage of any test section of gravity sewer. No additional leakage allowance will be made for manholes existing along the test section.

6.32 FAILURE OF TESTS

The maximum allowable leakage will be that calculated by the listed formula regardless of whether an exfiltration or an infiltration test is applied and regardless of the test head of water employed.

Where a section of sewer or manhole is found to have leakage exceeding the allowable limit, replacement or repairs shall be made to reduce the amount of leakage to or below the allowable limit at the Contractor's expense. Repaired sections shall be retested until they meet the allowable leakage limits.

PRESSURE SEWER LINES

6.33 PIPE AND FITTINGS

The material of pipe and fittings shall be PVC (poly vinyl chloride) suitable for 150 psi working pressure, unless otherwise stated in the drawings.

6.34 MATERIAL TESTING

Requirements for manufacturing and field testing procedures of pipe and fittings shall conform to AWWA C900 and the Standard Specification No.7, Waterworks.

6.35 SPECIAL EQUIPMENT AND STRUCTURES

Sewerage lift or pumping stations, including all piping, pumps, valves, regulators, etcetera to one meter outside the structure, shall be considered separately and conform to Special Specifications.

6.36 THRUST BLOCKING

Concrete thrust blocking shall be carried out according to the thrust blocking details of the Standard Drawings and provided at fittings as shown on the construction drawings. Concrete shall be placed between undisturbed ground and the fitting in such a manner, as to allow future access to bolts and joints for repair.

Concrete shall have 25 MPa minimum compressive strength in twenty-four hours when using high early strength cement, and in seven days when using standard cement.

6.37 CONSTRUCTION PROCEDURES

Construction shall conform to the Standard Specification No. 7, Waterworks.

6.38 PRESSURE TESTING

Pressure and leakage testing shall be carried out according to the Standard Specification No. 7, Waterworks.

MEASURE AND PAYMENT

6.39 MEASURE AND PAYMENT

The Tendered prices shall be payment in full for the performance of the Work to all Specifications contained herein and unless specified otherwise, shall include all equipment, labour and materials; the costs of excavating, hauling and stockpiling of excavated material; bedding, backfilling and compacting; supply, delivery, storage and distribution of material; shoring; laying and joining of pipes, fittings and other appurtenances; the handling of storm water; and the protection of the Works.