INVITATION TO TENDER 18-13

WATERFRONT SEWER UPGRADES PHASE I

MASTER MUNICIPAL CONSTRUCTION DOCUMENTS - 2009 Platinum Edition

UNIT PRICE CONTRACT

April 27th, 2018

301 St. Ann's Road, Campbell River, B.C. V9W 4C7
Telephone: 250.286.5766; Fax: 250.286.5763
clinton.crook@campbellriver.ca

INVITATION TO TENDER 18-13

WATERFRONT SEWER UPGRADES PHASE I

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The complete Contract Documents consist of the following parts:

1. The Master Municipal Construction Documents (Tender Package) consisting of the following parts (**included in this tender package)**:

    - Invitation to Tender
    - Instructions to Tenderers, Part I
    - Form of Tender
        - Appendix 1 -- Schedule of Quantities and Prices
        - Appendix 2 -- Preliminary Construction Schedule
        - Appendix 3 -- Experience of Superintendent
        - Appendix 4 -- Comparable Work Experience
        - Appendix 5 – Subcontractors
        - Appendix 6 – Tenderer's Current Projects Underway
    - Agreement - Draft
        - Schedule 1 -- Schedule of Contract Documents
        - Schedule 2 -- List of Contract Drawings
        - Appendix 7 - Safety Covenant
        - Appendix 8 - Prime Contractor Agreement
        - Appendix 9 – Letter of Acceptance – Base Course Gravel in Advance of Paving
    - Supplementary General Conditions
    - Supplementary Specifications

2. Additional reference documentation consisting of the following parts **(not distributed in this tender package) available at www.campbellriver.ca**:

    - Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419
    - City of Campbell River, Approved Utility Product List April 2011

3. The balance of the Master Municipal Construction Documents, Platinum, 2009 edition. These documents are available in the "MMCD - General Conditions, Specifications and Standard Detail Drawings" **(not distributed in this tender package)**:

INVITATION TO TENDER 18-13

WATERFRONT SEWER UPGRADES PHASE I

The City of Campbell River invites tenders for the Waterfront Sewer Upgrades Phase I project which includes the following generalized scope of work:

Approximately 1300m of 750mm and 220m of 250mm gravity sanitary sewers, including manholes, services and connection, restoration and all related appurtenances.

Asphalt paving is excluded from this contract and will be done by the City under a separate, standing paving contract. The work does include all preparation work for paving and coordination and scheduling directly with the paving contractor.

This Tender is available electronically by downloading from the City's website at:
http:\www.campbellriver.ca/city_services/purchasing/request_for_proposal.asp

A mandatory site meeting will **NOT** be held.

This Tender is scheduled to close at:

Tender Closing Time:	**3:00 p.m. local time**
Tender Closing Date:	**Tuesday May 15th, 2018** *There will NOT be a Public Opening for this Tender*
Delivered to:	City of Campbell River City Hall 301 St. Ann's Road 1st Floor Reception Desk Campbell River, BC V9W 4C7 **ATTN: Clinton Crook**
Tender Enquiries:	Clinton J. Crook, SCMP, CPSM Purchasing & Risk Management Officer Telephone: 250.286.5766 Email: clinton.crook@campbellriver.ca

INVITATION TO TENDER 18-13

WATERFRONT SEWER UPGRADES PHASE I

RECEIPT CONFIRMATION FORM

As receipt of this document, and to directly receive any further information, addendums, etc. regarding this competition, please return this form to:

ATTN: Clinton J. Crook, SCMP, CPSM,
Senior Buyer
Email: clinton.crook@campbellriver.ca
Fax: 250.286.5741

Company Name: _____

Address: _____

City: _____

Province/State: _____ Postal/Zip Code: _____

Telephone No: _____ Fax No: _____

Contact Person: _____

Title: _____

Email: _____

CITY OF CAMPBELL RIVER

INVITATION TO TENDER 18-13

WATERFRONT SEWER UPGRADES PHASE I

INSTRUCTIONS TO TENDERERS PART I

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INSTRUCTIONS TO TENDERERS - PART I

(TO BE READ WITH "INSTRUCTIONS TO TENDERERS - PART II" CONTAINED IN THE EDITION OF THE PUBLICATION "MASTER MUNICIPAL CONSTRUCTION DOCUMENTS" AND APPLICABLE CITY OF CAMPBELL RIVER BYLAWS SPECIFIED IN ARTICLE 2.2 BELOW)

Reference No.: **TENDER 18-13**

Contract: **WATERFRONT SEWER UPGRADES PHASE I**

Introduction **1**

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

Approximately 1300m of 750mm and 220m of 250mm gravity sanitary sewers, including manholes, services and connection, restoration and all related appurtenances.

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

Clinton J. Crook, SCMP, CPSM
Purchasing & Risk Management Officer
Telephone: 250.286.5766
Email: clinton.crook@campbellriver.ca

Tender Documents **2**

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 Drawings".

2.2 A portion of the Contract Documents is 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 contained in the publication entitled "Master Municipal Construction Documents - General Conditions, “Specifications and Standard Detail Drawings" and relevant sections of Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419. Refer to Schedule 1 attached to the Agreement or, if no edition has been specified, then the applicable edition shall be the most recent edition as of the date of this *Contract*. 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 judgement about its reliability, accuracy or completeness and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate or complete.

Submission of Tenders

3

3.1 Tenders must be submitted in a sealed opaque package, clearly marked on the outside with the above *Contract* Title and Reference No., and must be received on or before:

Tender Closing Time: **3:00 p.m. local time**

Tender Closing Date: **Tuesday May 15th, 2018**
There will NOT be a Public Opening for this Tender

Delivered to: City of Campbell River City Hall
301 St. Ann's Road
1st Floor Reception Desk
Campbell River, BC V9W 4C7
ATTN: Clinton Crook, Senior Buyer

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

3.3 Tender Submission

.1 Tenders **must** be submitted on the Tender Forms included in these tender documents. The addition to or changing of any words in these Tender Forms by the tenderer or the failure to comply with and complete all items may be cause for rejection without consideration of the tender.

.2 The Tender Submission **must** include acknowledgement of receipt of all issued addenda.

.3 The Tender Submission **must** include the specified financial security, in the form of the "Bid Security" as required in Section 5.2 of the Instructions to Tenderers Part II.

.4 The Form of Tender **must** bear the signature of a legal signing authority of the tenderer.

.5 Other than acknowledgement of receipt of addenda, or request for withdrawal or revision, documents submitted as part of a tender will **not** be considered if received by any of the Owner's facsimile machines.

.6 Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderers shall have any claim for any compensation of any kind whatsoever, as a result of participating in the tender, and by submitting a bid, each Tenderer shall be deemed to have agreed that it has no claim.

Additional Instructions to Tenderers **4**

Freedom of Information 4.1 The *Owner* is subject to the provisions of the Freedom of Information and Protection of Privacy Act. As a result, while Section 21 of the Act does offer some protection for third party business interests, the *Owner* cannot guarantee that any information provided to the *Owner* can be held in confidence. All tenders, after closing time and date become the property of the *Owner*.

Cost of Tender Submission 4.2 The *Owner* shall not be liable for a Tenderer's cost of submitting a tender.

Evaluation Criteria 4.3 (a) The *Owner* reserves the right to waive informalities in or reject any or all tenders or accept the tender deemed most favourable in the interests of the *Owner*. Tenders will be evaluated on the combination of information provided in the Form of Tender and Appendices, which may offer the best value and not necessarily the lowest price. The *Owner* reserves the right to conduct pre-selection meetings with Tenderers. The *Owner* further reserves the right to conduct post-selection meetings in order to correct, change or adapt the selected Tender to the wishes of the *Owner*. **Acceptance of any tender may be subject to budgetary considerations and/or City of Campbell River Council approval, and/or the approval of other jurisdictions having authority.**

Construction Association Policies 4.4

4.4.1 The *Owner* is not a member of the Public Construction Council of British Columbia, the British Columbia Construction Association or any other construction association.

4.4.2 The *Owner* does not adopt or agree to be bound by "The Procedures and Guidelines Recommended For Use on Publicly Funded Construction Projects" produced by the Public Construction Council of British Columbia, September 1989, or any other procedure/guideline recommended, adopted or produced by any construction association in the tendering and award of the *Contract* of this project.

Good Neighbour Policy 4.5

4.5.1 The *Owner's* Good Neighbour Policy as adopted by City of Campbell River Council on April 15, 1997 shall apply to this contract.

4.5.2 The Policy states: "That Contractors working on Municipal rights-of-way or on private land where new rights-of-way are being created, be required to provide written notice to the residents in the immediate area of the works, describing what is being constructed, when the works will occur, who to contact for more information and what precautions should be taken if necessary; and that the work-site be posted for safety reasons."

Mandatory Site Meeting

4.6 A Mandatory Site Meeting will **NOT** be held.

Addition\Deletion

4.7 Tenderers are advised that the *Owner* may, at its option, and subject to available funding and budgetary considerations, delete any *Work* described in the *Contract Documents* or may require that optional work be added to the scope of *Work*.

Omissions and Discrepancies

4.8 The Tenderer must carefully examine the *Contract Documents* and the site of the proposed works, judging for and satisfying themselves as to the probable conditions to be encountered. Should a Tenderer find omissions from or discrepancies in the *Contract Documents*, or be in doubt as their meaning, the Tenderer should notify the Owner no later than 5 days prior to the tender closing, who may cause to send a written instruction to all Tenderers in the form of an addendum, which shall become part of the contract and shall be covered in the contract price. The Tenderer may not claim, after the submission of a tender, that there was any misunderstanding with respect to the conditions imposed by the documents. No oral interpretations made to a Tenderer as to the meaning of the *Contract Documents* shall be considered binding. Every request for an interpretation shall be made in writing, forwarded to the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I.

Amendment of Tenders

4.9

4.9.1 Delete Paragraphs 12.1 of the Instructions to Tenderers, Part II and replace with the following paragraphs 4.9.2 and 4.9.3:

4.9.2 A Tenderer may, without prejudice to itself, withdraw or revise a tender after it has been deposited with the *Owner*, provided the request for withdrawal or revision is filed with the *Owner* in writing before the time set for the Tender closing. Non-facsimile request(s) should be submitted in a sealed opaque envelope clearly marked with the contract name and reference number to the office referred to in paragraph 3.1 of the Instructions to Tenderers - Part 1. In the case of revision(s), a revised price will not be accepted, only the addition to or deduction from the tender price will be accepted. Written withdrawals or revisions must be signed by the same person or persons who signed the original Form of Tender.

4.9.3 In the case of facsimile or e-mail requests for withdrawal or revision, they will only be accepted if they are received by the *Owner's*

Supply Management Department facsimile machine at 250.286.5763 or via e-mail at clinton.crook@campbellriver.ca before the scheduled tender closing time. Tenderers assume the entire risk that the facsimile and computer equipment and staff at the above office will receive the facsimile or e-mail containing the withdrawal or revision. The *Owner* assumes no risk or responsibility whatsoever that any facsimile or e-mail will be received as required and shall not be liable to any *Tenderer* if for any reason a facsimile or e-mail is not received.

For purposes of this paragraph 4.9.3,"received" means the request for withdrawal or revision is visible to the *Owner's* staff in its entirety, and is either in printed form or is capable of immediate reproduction in printed form.

Sub-Surface Conditions 4.10 A geotechnical assessment was carried out on November 14th and November 15th, 2017 and consisted of three boreholes. The report is attached to this tender following the Supplementary General Conditions.

Environmental Conditions 4.11 No environmental assessment has been completed for this project.

Working Hours 4.12 Work inside the *Owner's* Property shall be carried out between the hours of 7:00 a.m. and 10:00 p.m. seven (7) days a week unless other arrangements are made between the *Owner* and the *Contractor*.

Commencement And Completion of Work 4.13 The *Owner* requires that the *Work* under this Contract be completed as quickly as possible after *Contract* award, and within the following milestones:

Substantial Performance of this *Contract* to be achieved within 90 days from Notice to Proceed.

Form of Tender

CITY OF CAMPBELL RIVER

Reference No.: **TENDER 18-13**

Contract: **WATERFRONT SEWER UPGRADES PHASE I**

TO OWNER:

1 I (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) **(TENDERER TO COMPLETE)**

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

2 ACCORDINGLY I (WE) HEREBY OFFER:

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

2.2 to achieve *Substantial Performance* of the *Work* within 90 days from receipt of a Notice to Proceed; and

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 Lump Sums 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

Tenderer's Initial	Owner's Initial

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*.

3 I (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.

4 I (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 stated as:

A tender must be accompanied by the *Bid Security* in the form of:

a a Bid Bond issued by a surety licensed to carry on the business of suretyship in British Columbia in a form reasonably satisfactory to the *Owner*; or

b cash, bank draft or letter of credit in a form acceptable to the *Owner*;

in an amount equal to 10% of the *Tender Price*.

5 I (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 10 *Days* of receipt of the written *Notice of Award* deliver to the *Owner*:

Tenderer's Initial	Owner's Initial

a a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the *Contract Price*, 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*; and

b a *Construction Schedule*, as provided by GC 4.6.1; and as per *Supplemental Specifications* in 01 31 00S; and

c a "clearance letter" indicating that the tenderer is in WCB compliance; and

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

e a Health and Safety Program Manual pertaining to the Work;

f a Traffic Management Plan as specified in Supplementary Specification 01 55 00;

g a Construction Environmental Protection Plan.

5.1.2 As per General Condition 4.6.6, the Owner shall issue the Notice to Proceed within 14 days of receipt of the documentation required under item 5.1.1 above.

5.1.3 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*.

5.1.4 sign the *Contract Documents* as required by GC 2.1.2.

6 I (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

Tenderer's Initial	Owner's Initial

Notice to Proceed,

then such failure or refusal will be deemed to be a refusal by me (us) to enter into the *Contract* and the *Owner* may, on written notice to me (us), award the *Contract* to another party. I (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 my (our) *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the *Work*.

7 I (WE) DECLARE THAT:

7.1 no person, firm or company other than the undersigned, has any interest in this tender or in the proposed *Contract* for which this tender is made;

7.2 this tender is made without any connection, knowledge, comparison of figures, or agreement with any other company, firm or person making a tender for the same work;

7.3 in tendering for this work, and when called upon to enter into an agreement with the *Owner*, I (we) will be bound to comply with all laws, statutes, and municipal bylaws pertaining to the work. The agreement will be governed by the laws of the province of British Columbia;

7.4 in submitting this tender I (we) did not rely upon any information provided by the *Owner*, or any of the *Owner's* employees or agents, relating to the conditions, contingencies, risks or other circumstances, local or otherwise, which might influence or affect the performance or the cost of the work, including, without limiting the nature of the ground, subsoil, substrata of the work site, the means of access to the work site, the quality, quantity, nature or location of the materials to be furnished or removed in performance of the work, and the conditions under which the labour force will be employed, except the extent that any such information is expressly set forth in the *Contract Documents*. I (we) have relied on our own examination of the work site and have informed ourselves as to all conditions, contingencies, risks, and circumstances, local or otherwise, which might

Tenderer's Initial	Owner's Initial

influence or affect the performance or the cost of the work. I (we) accept the site prior to the signing of the *Contract*.

8 WE AGREE:

8.1 The work shall be completed entirely in 120 *Days* from Notice to Proceed (The Designated Completion Period);

8.2 There shall be no exclusion of time from the Designated Completion Period for any reason OTHER than delays clearly attributable to the OWNER, its agents, employees or any Authorized Representatives.

9 I (WE) DECLARE THAT:

9.1 I (we) recognize that the lowest or any tender will not necessarily be accepted; and

9.2 I (we) recognize that the *Owner* reserves the right to reject all tenders or to accept the tender which best suits its long term objectives; and

I (we) recognize that the *Owner* reserves the right to accept or reject all or part of this Tender at any time during the period specified by paragraph 5.1 of this Form of Tender.

10 I (WE) DECLARE THAT:

10.1 I (we) do not (or any related company) have any family, ownership, and operating relationships with the City of Campbell River, or any elected official, staff or other officials holding public office in the City of Campbell River and agree that the Owner reserves the right to reject any tender that may be perceived to be in a conflict of interest.

11 I (WE) DECLARE THAT:

11.1 In this tender:

(a) "Related Party of the Tenderer" means:
- an officer or director of the Tenderer;
- a shareholder of the Tenderer;
- a corporation with a shareholder or director who is also a shareholder or director of Tenderer;

(b) "Public Authority" has the same meaning as under the Community Charter.

Tenderer's Initial	Owner's Initial

11.2 I (we) hereby declare that neither the Tenderer nor a Related Party of the Tenderer:

(a) has had a bid bond or performance bond retained or claimed against;
(b) has breached a contract for works or services with the *Owner* or other Public Authority in British Columbia;
(c) has been engaged in a legal action against the *Owner* or another Public Authority in British Columbia, or the elected or appointed officers and employees of the *Owner* or that other Public Authority, in relation to;
- any other contract for works or services;
- any matter arising from the exercise of the *Owner's* or the other Public Authority's powers, duties or functions under the Community Charter, Local Government Act or other enactment;

(d) has been charged or convicted of an offence in relation to the performance of a contract for works or services with the *Owner* or other Public Authority;

within five years of the closing date of this Tender.

Tenderers who are unable to truthfully complete this declaration must provide full particulars of the relevant circumstances. Submission of a false declaration is grounds for rejection of a tender.

11.3 I (we) hereby declare that the *Owner* may in its absolute discretion reject a Tender submitted by a Tenderer if the Tenderer or a Related Party of the Tenderer:

(a) has had a bid bond or performance bond retained or claimed against;

(b) has breached a contract for work or services with the *Owner* or other Public Authority in British Columbia;

(c) has been engaged in a legal action against the *Owner* or another public authority in British Columbia, or the elected or appointed officers and employees of the *Owner* or that other public authority, in relation to:

- any other contract for works or services;
- any matter arising from the exercise of the *Owner's* or the other public authority's powers, duties or functions under the Community Charter, Local Government Act

Tenderer's Initial	Owner's Initial

or other enactment;

(d) has been charged or convicted of an offence in relation to the performance of a contract for works or services with the *Owner* or other Public Authority;

within five years of the closing date of this Tender.

11.4 I (we) hereby declare that in determining whether to reject a tender the *Owner* will consider whether:

(a) the legal action is likely to affect the Tenderers ability to work with the *Owner*, its consultants and representatives, and;

whether the *Owner's* or other public authority's experience with the Tenderer indicates that the *Owner* is likely to incur increased costs including but not limited to staff and legal costs in the administration of this contract if it is awarded to the Tenderer.

12 I (WE) AGREE THAT:

12.1 I (we) agree that if any director, officer or employee, agent or other representative of a Tenderer makes any representation or solicitation to the Mayor, any Councillor, officer or employee of the City of Campbell River, other than those specifically designated in the Tender documents, with respect to this Tender, whether before or after the submission of the Tender, the City shall be entitled to reject or not accept the Tender.

Tenderer's Initial	Owner's Initial

MY (OUR) ADDRESS is as follows:

_____
(Full Legal Name of Corporation, Partnership or Individual)

_____
(address)

_____

_____
(city, province) (postal code)

Phone: _____

Fax: _____

E-mail: _____

This Tender is executed this _____ day of _____, 2018.

_____
(Printed Name)

_____
(Authorized Signatory)

Tenderer's Initial	Owner's Initial

Appendix 1

SCHEDULE OF QUANTITIES AND PRICES – GST EXCLUDED

(See paragraph 5.3.1 of the Instructions to Tender – Part II)

(All prices and *Quotations* including the *Contract Price* shall include all *Taxes,* but shall not include *GST, GST* shall be shown separately)

Item	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
	01 - GENERAL ITEMS					
		01 01 01 Mobilization and Demobilization				
1	1.1.1-1.1.5	Mobilization & Demobilization (maximum 10% of Tender Price)	LS	1		
		01 33 01 Project Record Documents				
2	1.8.1	Project record documents	LS	1		
		01 52 01 Temporary Structures				
3	1.6.1	Temporary structures	LS	1		
		01 53 01 Temporary Facilities				
4	1.9.1	Sanitary facilities, site storage, loading and hoardings	LS	1		
		01 55 00 Traffic Control, Vehicle Access and Parking				
5	1.5.1	Traffic control, vehicle access and parking	LS	1		
6	1.5.2	Dynamic message signs; optional	wk	26		
		01 62 00 Removals				
7	7.1.5	Removals	LS	1		
		01 57 01 Environmental Protection				
8	1.6.1	Temporary erosion and sediment control	LS	1		
	03 - CONCRETE					
		03 30 20 Concrete Walks, Curbs and Gutters				
9	1.4.4	Hand formed curb and gutter - barrier curb to Std. Drg. C4	m	216		
10	1.4.5	Sidewalk including ramps, 100 mm thick, c/w granular base; Std. Drg. C2	m^2	357		
11	1.4.6	Concrete driveway panels; 125 mm thick [8 driveways]	m^2	290		
					Sub-Total Page 9:	

Tenderer's Initial | Owner's Initial

Item	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
12	1.4.11	Remove and replace brick pavers	m^2	242		
		03 30 55 Precast Interlocking Blocks				
13	1.3.1/2	Interlocking Blocks	m^2	70		
	31 - EARTHWORKS					
		31 22 16 Reshaping Granular Roadbeds				
14	1.4.1	Asphalt restoration preparation [15 driveways]	m^2	135		
15	1.4.5	Temporary gravel running surface	LS	1		
		31 22 16.1 Reshaping Existing Subgrade				
16	1.4.2	Remove unsuitable subgrade; optional work	m^3	150		
		31 23 01 Excavating, Trenching and Backfilling				
17	1.10.3	Over-excavation including backfilling; optional	m^3	150		
18	1.10.9	Pre-locates of key utilities prior to start of construction	ea	3		
19	1.10.9	Pre-locate all the existing sanitary services	ea	71		
		31 23 17 Rock Removal				
20	1.6.4/5	Boulders and rock fragments - blasting not permitted; optional	m^3	50		
		31 23 23 Controlled Density Fill				
21	1.4.1	CDF; pipe 200 mm diam.	m	785		
22	1.4.1	CDF; pipe 250 mm diam.	m	565		
	32 - ROADS AND SITE IMPROVEMENTS					
		32 01 16 Cold Milling				
23	1.5.1	Milling 200mm wide for permanent pavement restoration, 50mm depth	m	3438		
		32 11 16.1 Granular Subbase				
24	1.4.2	Granular subbase; optional work	T	375		
					Sub-Total Page 10:	

Tenderer's Initial | Owner's Initial

Item	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
		32 11 23 Granular Base				
25	1.4.1	Granular base; optional work	T	87		
26	1.4.5	Gravel driveway restoration 19 mm gravel; 100 mm thk [15 driveways]	m^2	192		
27	1.4.5	Gravel driveway restoration Blue Chip; 100 mm thk; optional	m^2	36		
		32 12 16 Hot-Mix Asphalt Concrete Paving				
28	1.5.7	Saw cut asphaltic or concrete pavements in preparation for new asphalt concrete; 50 mm depth; mainline	m	2818		
29	1.5.7	Saw cut asphaltic or concrete pavements in preparation for new asphalt concrete; 50 mm depth; service connections	m	620		
30	1.5.9	Coordination of Owner's Asphalt Contractor	LS	1		
		32 17 23 Painted Pavement Markings				
31	1.5.2	Permanent painted pavement marking	LS	1		
		32 93 01 Planting of Trees, Shrubs and Ground Covers				
32	1.9.5	Landscape restoration	ea	21		
33	1.9.5	Landscape restoration; optional [342 & 352]	ea	2		
	33 - UTILITIES					
		33 01 30.1 CCTV Inspection of Pipelines				
34	1.6.2	CCTV pipeline inspection	m	1572		
		33 11 01 Waterworks - Imported Backfill				
35	1.8.1/2	Pipe - 25 mm diam. PE PC150; all depths	m	141		
36	1.8.1/2	Pipe - 300 mm diam. C900 DR18; all depths	m	6		
37	1.8.4	Service connection - 19 mm diam., all lengths	ea	1		
38	1.8.4	Service connection - 25 mm diam., all lengths	ea	1		
39	1.8.13	Tie-in - 300 mm to be totally performed by Contractor; 2+330	ea	1		
					Sub-Total Page 11:	

Tenderer's Initial | Owner's Initial

Item	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
		33 30 01 Sanitary Sewers - Imported Backfill				
40	1.6.1/2	Pipe - 200 mm diam. PVC DR35; < 2 m depth	m	10		
41	1.6.1/2	Pipe - 250 mm diam. PVC DR35; < 2 m depth	m	75		
42	1.6.1/2	Pipe - 250 mm diam. PVC DR35; 2 m - 3 m depth	m	82		
43	1.6.1/2	Pipe - 250 mm diam. PVC DR35; 3 m - 4 m depth	m	60		
44	1.6.1/2	Pipe - 750 mm diam. PVC DR35; < 2 m depth	m	233		
45	1.6.1/2	Pipe - 750 mm diam. PVC DR35; 2 m - 3 m depth	m	724		
46	1.6.1/2	Pipe - 750 mm diam. PVC DR35; 3 m - 4 m depth	m	225		
47	1.6.1/2	Pipe - 750 mm diam. PVC DR35; 4 m - 5 m depth	m	124		
48	1.6.3	Service connection - 100 mm diam., all lengths	ea	66		
49	1.6.3	Service connection - 150 mm diam., all lengths	ea	5		
50	1.6.4	Inspection Chamber	Ea	71		
51	1.6.7	Tie-in - 250 mm diam. pipe into existing 1050 mm diam. MH [EX SMH4]	ea	1		
52	1.6.7	Tie-in - 250 mm diam. pipe into existing 200 mm diam. AC pipe with MH [SMH3]	ea	1		
53	1.6.7	Tie-in - 750 mm diam. pipe into existing 1050 mm diam. sewer with MH	ea	1		
		33 34 01 Sewage Forcemains - Imported Backfill				
54	1.8.1/2	Pipe - 75 mm diam. PVC - Pressure Class C165	m	141		
55	1.8.1/2	Pipe - 750 mm diam. PVR at 2m depth - Pressure Class C165	m	28		
56	1.8.3	Bend 45 deg. - 75 mm PVC Pressure Class C165	ea	2		
57	1.8.11	Cap - 750 mm	ea	1		
					Sub-Total Page 12:	

Tenderer's Initial | Owner's Initial

Item	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
		33 40 01 Storm Sewers - Imported Backfill				
58	1.6.1/2	Pipe - 600 mm diam. PVC ribbed	m	22		
59	1.6.1/2	Pipe – 750mm csp	m	15		
60	1.6.9	Tie-in - 600 mm diam. pipe into existing DMH	ea	1		
		33 44 01 Manholes and Catchbasins				
61	1.5.1.1	Manhole base, lid, slab, cover and frame - 1050 mm diam.	ea	1		
62	1.5.1.1	Manhole base, lid, slab, cover and frame - 1350 mm diam.	ea	19		
63	1.5.1.1	Manhole base, lid, slab, cover and frame - 1800 mm diam.	ea	1		
64	1.5.1.2	Manhole riser section - 1050 mm diam.	Vert. m	4.5		
65	1.5.1.2	Manhole riser section - 1350 mm diam.	Vert. m	46.3		
66	1.5.1.2	Manhole riser section - 1800 mm diam.	Vert. m	3.9		
67	1.5.4	Rebench existing manhole	ea	3		
68	1.5.5	Outside ramp manhole base, lid, slab, cover and frame - 1050 mm diam.	ea	1		
					Sub-Total Page 13:	

SUMMARY	
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Sub-Total Page 12	
Sub-Total Page 13	
Sub-Total:	
GST (5%):	
Total:	

Tenderer's Initial	Owner's Initial

Appendix 2

PRELIMINARY CONSTRUCTION SCHEDULE

(See paragraph 5.3.2 of the Instructions to Tenderers - Part II)

Indicate Time-Scaled Network Construction Schedule Based On *Critical Path Method*.
See Supplemental Specification 01 31 00S For Further Detail

ACTIVITY (with milestone dates)	CONSTRUCTION SCHEDULE WITH CRITICAL PATH SHOWN (weeks)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Tenderer's Initial | Owner's Initial

Appendix 3

EXPERIENCE OF SUPERINTENDENT
(See paragraph 5.3.3 of the Instructions to Tenderers - Part II)

Name: _____

Experience:

1. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

   References: _____

2. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

   References: _____

3. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

   References: _____

Tenderer's Initial	Owner's Initial

Appendix 4

COMPARABLE WORK EXPERIENCE
(See paragraph 5.3.4 of the Instructions to Tenderers - Part II)

PROJECT	OWNER/ CONTRACT NAME	PHONE NUMBER	WORK DESCRIPTION	VALUE ($)

Tenderer's Initial	Owner's Initial

Appendix 5

SUBCONTRACTORS
(See paragraph 5.3.5 of the Instructions to Tenderers - Part II)

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER

Tenderer's Initial | Owner's Initial

Appendix 6

TENDERERS CURRENT PROJECTS UNDERWAY

PROJECT	OWNER/ CONTRACT NAME	PHONE NUMBER	WORK DESCRIPTION	VALUE ($)	% COMPLETE

Tenderer's Initial | Owner's Initial

Draft Agreement

Between Owner and Contractor

THIS AGREEMENT made in duplicate this _____ day of _____, 2018.

Reference No.: **TENDER 18-13**

Contract: **WATERFRONT SEWER UPGRADES PHASE I**

BETWEEN: **CITY OF CAMPBELL RIVER**

(the "*Owner*")

AND: **TBD**

(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* within 90 Days of being issued a Notice to Proceed subject to 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 "*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:

3.1.1 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 Lump Sums listed in the *Schedule of Quantities and Prices*; plus

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

3.1.3 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 hereunder 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, e-mail, fax, or by pre-paid registered mail to the addresses as set out below:

The *Owner*:
City of Campbell River
301 St. Ann's Road
Campbell River, BC
V9W 4C7
Attention: Mr. Jason Hartley, P.Eng., Capital Works Manager
E-mail: Jason.hartley@campbellriver.ca

The *Contractor*:
TBD

The *Contract Administrator*:
Highland Engineering Services Ltd.
104-950 Alder Street
Campbell River, BC
V9W 2P8
Attention: Mr. Glenn Blake P.Eng.
E-mail: glennblake@highland-eng.ca

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

6.2.1 immediately upon delivery, if delivered by hand; or

6.2.2 immediately upon transmission if sent and received by fax or e-mail; or

6.2.3 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 or e-mail assumes all risk that the fax or e-mail will be received properly, and the provisions of paragraph 12.5 of the Instructions to Tenderers, Part II apply to the sender.

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*:**

TBD

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

_____
(AUTHORIZED SIGNATORY)

_____
(WITNESS)

***Owner*:**

City of Campbell River

_____
(AUTHORIZED SIGNATORY)

_____
(WITNESS)

SCHEDULE 1

CITY OF CAMPBELL RIVER

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", 2009 PLATINUM edition. All sections of this publication are included in the *Contract Documents*.

The documents noted with "**" are available at www.campbellriver.ca

a) Agreement;
b) Addenda;
c) Supplementary General Conditions;
d) General Conditions*;
e) Supplementary Specifications;
f) Specifications*;
g) Drawings listed in Schedule 2 to the Agreement;
h) Supplementary Detail Drawings;
i) Standard Detail Drawings*;
j) Executed Form of Tender;
k) Instructions to Tenderers;
l) All other Contract Drawings;
m) Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419**;
n) City of Campbell River: Approved Utility Product List**;
o) Geotechnical Assessment Campbell River Waterfront Sewer Upgrade, December 2017

SCHEDULE 2

CITY OF CAMPBELL RIVER

List of Contract Drawings

(Complete listing of all drawings, plans and sketches which are to form a part of this Contract, other than Standard Detail Drawings and Supplementary Standard Detail Drawings.)

TITLE	DRAWING NO.	SHEET NO.	DATE	REVISION DATE	REVISION NO.
Waterfront Sewer System Upgrades Cover Sheet-General Notes, Legend, Key Plan & Drawing List	17-524-C000	1	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Plan & Profile STA 1+000 to STA 1+360	17-524-C101	2	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Plan & Profile STA 1+360 to STA 1+720	17-524-C102	3	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Plan & Profile STA 1+720 to STA 2+080	17-524-C103	4	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Plan & Profile STA 2+080 to STA 2+440	17-524-C104	5	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Plan & Profile STA 2+440 to STA 2+525	17-524-C105	6	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Future Lift Station #18 System Upgrade	17-524-C106	7	16/03/18	04/26/18	2
Sanitary Forcemain and Drain Plan and Profile Retaining Wall Details	17-524-C107	8	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Civil Details	17-524-C201	9	16/03/18	04/26/18	2
Waterfront Sewer System Upgrades Civil Details	17-524-C202	10	16/03/18	04/26/18	2
				1	

Appendix 7

SAFETY COVENANT

BETWEEN:

_____ of
(Company Name (Print legibly)

_____
(Address)

_____
(City) (Postal Code)

_____
(Phone no.) (Fax no.)

hereinafter referred to as the "Contractor"

AND:

CITY OF CAMPBELL RIVER

hereinafter called the "Owner"

WHEREAS:

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the Occupational Health and Safety (OHS) Regulation, B.C. Reg. 296/97, as may be amended from time to time, that are applicable to the work being performed, and as well will comply with the provisions of the *Workers Compensation Act, R.S.B.C, 1996, c.492*, as amended (the 'Act').

Without limiting the generality of the foregoing, the Contractor agrees:

1) Before commencing any work for the Owner, the Contractor will consult the OHS Regulation and will determine which provisions of the OHS Regulation is applicable to the work that the Contractor is to perform. The Contractor will strictly comply with all applicable OHS Regulations when performing the work.

2) Before commencing any work for the Owner, the Contractor will review and familiarize itself with any existing policies or procedures developed by the Owner in relation to the work. If in the opinion of the Contractor, by following a policy or procedure that the Owner has established in relation to the work, the Contractor, or an employee of the Contractor or of the Owner, or any other worker, is put at increased risk, the Contractor must request a written change of policy or procedure from the Owner, applicable only to the work the Contractor is to perform, before proceeding with the work. The Owner reserves the right to refuse to amend its policies or procedures in response to any such request where the Owner, after such consultation with WorkSafe BC as the Owner considers necessary, determines that the Owner's policy or procedure does not increase the risk to any worker at the location of the work to be performed, and determines that the

Contractor's request is unreasonable, or is unnecessary for the protection of workers at the location of the work.

3) To have read every section of the OHS Regulation that pertains to the job at hand, to ensure that it understands the pertinent OHS Regulation and its application to the supervisor(s) and to all of the workers at the location of the work, and to ensure that each worker under the Contractor's supervision follows the applicable OHS Regulation. To assist Contractors with this task, the City of Campbell River directs them to consult with WorkSafe BC directly, to access the WorkSafe BC Regulations and Policies available on the WorkSafe BC website.

4) To understand, comply with and, to the full extent of the Contractor's lawful authority, to enforce all of the following provisions of the OHS Regulation as they pertains to the job at hand and to the workers employed by the Contractor, and to provide to the owner, at any time upon request, evidence of compliance with the following:

a) Rights & Responsibilities – Occupational Health & Safety Program (Part 3, including investigations, inspections, written instructions, records and statistics, adequate supervision, complete understanding by the workforce of the right and responsibility to refuse unsafe work)
b) General Conditions (Regulation – Part 4)
c) Chemical and Biological Substances (Regulation – Part 5)
d) Substance Specific requirements (Regulation – Part 6)
e) Noise, Vibration, Radiation and Temperature (Regulation – Part 7)
f) Personal Protective Clothing and Equipment (Regulation - Part 8)
g) Confined Space Entry (Regulation – Part 9)
h) Lock-out (Regulation – Part 10)
i) Fall Protection (Regulation – Part 11)
j) Tools, Machinery and Equipment (Regulation – Part 12)
k) Ladders, Scaffolds and Temporary Work Platforms (Regulation – Part 13)
l) Cranes and Hoists (Regulation – Part 14)
m) Rigging (Regulation – Part 15)
n) Mobile Equipment (Regulation – Part 16)
o) Traffic Control (Regulation – Part 18)
p) Electrical Safety (Regulation – Part 19)
q) Construction, Excavation & Demolition (Regulation – Part 20)
r) Forestry Operations (Regulation – Part 26)
s) Evacuation and Rescue (Regulation – Part 32)
t) Occupational First Aid (Regulation – Part 33)
u) Coordination of Multiple Employer Workplaces (Regulation – Part 20, s. 20.3)

PROVISIONS OF THE *WORKERS COMPENSATION ACT* – PART 3 SPECIFIC TO CONTRACTORS ON A WORKSITE:

i. Division 3 – General duties of Employers, Workers and Others (Sections 115, 116, 117, 118, 119, 120, 121, 122, 123, 124);
ii. Division 4;
iii. Division 10.

5) The *Workers Compensation Act* stipulates that the Owner (the City of Campbell River) is required to enforce any observed infraction of the Act or Regulation. The Contractor accepts that the City of Campbell River will be conducting periodic checks of the Contractor during the Contractor's work for the City of Campbell River and will be asking the Contractor to comply with the Act/Regulation in the event that any contravention is observed. If a contravention is observed and not corrected, the Contractor may be asked to leave the worksite and may result in termination of the contract for the work.

6) For the purposes of streamlining large construction projects and multiple employer worksites, the Owner reserves the right to designate a "prime contractor" amongst contractors who are working on a job-site together. A designated person employed by the "prime contractor" – appointed by the Owner - will act as the coordinator of the other contractors on that job-site and will ensure that each of the contractors on the job site are following all of the Act and WorkSafe BC Regulations as well as site-specific policies and procedures. This includes having in place an approved WorkSafe BC Safety Program and a list of the qualified persons amongst the other contractors who have been designated to be responsible for each of the other contractor's site health and safety activities.

7) In the event that a prime contractor has been designated, it is the responsibility of the Contractor to inquire who the "prime contractor" is for the worksite and to comply with the requirements for a multiple employer worksite where a prime contractor has been designated, as set out in the preceding section.

NOTE:

a) Payment of WorkSafe BC Assessments by any Contractor does not obviate the responsibility of the contractor to any of the foregoing.

b) The foregoing constitutes requirements of the Prevention Division of WorkSafe BC for any workplace in the Province of British Columbia and constitutes the Owner's expectations of contractors.

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the B.C. Employment Standards Act (RSBC 1996), as may be amended from time to time, that are applicable to the work being performed, including but not limited to:

1) Section 36 (2); an employer must ensure that each employee has at least 8 consecutive hours free from work between each shift worked.

2) Section 39; despite any provision of this Part, an employer must not require or directly or indirectly allow an employee to work excessive hours or hours detrimental to the employee's health or safety.

THIS Covenant made the _____day of _____, 2018, in

_____ in the Province of British Columbia.
(City)

CONTRACTOR:

_____
Company Name

_____
Authorized Signatory

_____

Appendix 8

PRIME CONTRACTOR AGREEMENT

1. The Contractor shall, for the purposes of the Workers Compensation Act, and for the duration of the Work of this Contract:

   .1 be the "prime contractor" for the "Work site", and
   .2 do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and its regulations, as required to ensure the health and safety of all persons at the "Work site".

.2 The Contractor shall direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, Workers and any other persons at the "Work site" on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:

   .1 whether or not any contractual relationship exists between the Contractor and any of these entities, and
   .2 whether or not such entities have been specifically identified in this Contract.

As per the requirements of the Workers Compensation Act Part 3, Division 3, Section 118(1-3) which states:

Coordination of multiple-employer Workplaces

118(1) In this section:

"multiple-employer Workplace" means a Workplace where Workers of 2 or more employers are Working at the same time;

"prime contractor" means, in relation to a multiple-employer Workplace,

(a) the directing contractor, employer or other person who enters into a written agreement with the owner of that Workplace to be the prime contractor for the purposes of this Part, or
(b) if there is no agreement referred to in paragraph (a), the owner of the Workplace.

(2) The prime contractor of a multiple-employer Workplace must

(a) ensure that the activities of employers, Workers and other persons at the Workplace relating to occupational health and safety are coordinated, and
(b) do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with this Part and the regulation in respect to the Workplace.

(3) Each employer of Workers at a multiple-employer Workplace must give to the prime contractor the name of the person the employer has designated to supervise the employer's Workers at that Workplace.

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the B.C.

Employment Standards Act (RSBC 1996), as may be amended from time to time, that are applicable to the work being performed, including but not limited to:

3) Section 36 (2); an employer must ensure that each employee has at least 8 consecutive hours free from work between each shift worked.

4) Section 39; despite any provision of this Part, an employer must not require or directly or indirectly allow an employee to work excessive hours or hours detrimental to the employee's health or safety.

I fully understand and accept the responsibilities of the prime contractor designation in accordance with the Workers Compensation Act and the B.C. Employment Standards Act while contracted by the *City* on

project location: _____ and will abide by all Workers Compensation Board Regulation requirements.

Date: _____

Project: _____

Company Name: _____

Authorized Signatory: _____

Printed Name: _____

Witness Signatory: _____

Printed Name: _____

Appendix 9

ACCEPTANCE OF BASE COURSE FOR ASPHALT PAVING

Prior to the laying of asphalt pavement, representatives from (i) the City and Tayco Paving, for direct City constructed project **or** from (ii) the City's Consultant, and the General Contractor for contracted projects, agree to the condition, surface elevations and quality of the road base.

Date: _____

Owner or Consultant's Representative:

_____

General Contractor Representative:

_____

This acceptance does not relieve the General Contractor or the City's Consultant of their responsibilities for the surface elevations and/or condition or subsequent failure of materials below the asphalt pavement. Tayco Paving will continue to be responsible for the asphalt paving relating to the asphalt material and its placement.

The general conditions and specifications for the work will apply and take the precedence over this acceptance. The "Limiting Terms and Conditions" of Tayco Paving also take precedence over this acceptance.

An acceptable method of checking elevations will be used to ensure that the road base is graded ready for asphalt. The intention of this survey is to ensure that asphalt tonnage does not exceed Tayco's calculated estimated tonnage by more than 5%.

Conversion from square metres to tonnage will be calculated at the rate of 125 Kg per square metre for a 50mm thickness of asphalt.

SUPPLEMENTARY GENERAL CONDITIONS

**TO BE READ WITH "General Conditions"
CONTAINED IN THE PLATINUM EDITION (printed 2009) OF THE PUBLICATION
"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS"**

Reference No.: **TENDER 18-13**

Contract: **WATERFRONT SEWER UPGRADES PHASE I**

TABLE OF CONTENTS

DEFINITIONS **1.0**

1.67.1 ***(delete clause 1.67.1 and replace as follows)***
"Substantial Performance" means the stage of completion of all of the *Work*, as certified by the *Payment Certifier*, when:

a) the *Work* is ready for use or is being used for its intended purpose; **and**

b) the total of the incomplete, defective and deficient Work can be completed at an estimated cost of no more than:

3% of the first $500,000 of the *Contract Price*
2% of the next $500,000 of the *Contract Price*
1% of the balance of the *Contract Price*

1.79 ***(add new clause 1.79 as follows)***
"(amend clause X.XX as follows)" preceding a supplementary clause means this clause provides additional information or restrictions to the referenced clause in the Master Municipal Construction Documents, Volume II.

1.80 ***(add new clause 1.80 as follows)***
"(add new clause X.XX as follows)" preceding a supplementary clause means this clause provides additional requirements or information not found in the Master Municipal Construction Documents, Volume II.

1.81 ***(add new clause 1.81 as follows)***
"(delete clause X.XX and replace as follows)" preceding a supplementary clause means this clause replaces the referenced clause in the Master Municipal Construction Documents, Volume II, in its entirety.

1.82 ***(add new clause 1.82 as follows)***
"Payment Certifier" has the meaning set out in SGC 18.6.6.

1.83 ***(add new clause 1.83 as follows)***
"Provide" or "Provision of" means supply and placement of an item.

1.84 ***(add new clause 1.84 as follows)***
"Engineer" shall mean the *Owner's* engineer appointed to provide technical support during the course of the *Work.*

DOCUMENTS **2.0**

Interpretation 2.2.5 ***(add new clause* 2.2.5 *as follows)***
The Contract Drawings shall not be used for the construction of the Work unless Issued For Construction by the *Contract Administrator.*

CONTRACTOR **4.0**

Protection of Work, Property and the Public 4.3.7 ***(add new clause 4.3.7 as follows)***
The *Contractor* shall locate, mark and protect from damage or disturbance, any and all stakes, survey pins, monuments and markers at the *Place of the Work.*

All survey stakes, pins, monuments or markers which, in the opinion of the *Owner*, have been damaged or disturbed shall be made good following construction by a registered B.C. Land Surveyor at the *Contractor's* expense.

Good Neighbour Policy 4.3.8 ***(add new clause 4.3.8 as follows)***
The *Owner's* Good Neighbour Policy as adopted by City of Campbell River Council on April 15, 1997 shall apply to this contract. The Policy states: "That *Contractors* working on Municipal rights-of-way or on private land where new rights-of-way are being created, be required to provide written notice to the residents in the immediate area of the works, describing what is being constructed, when the works will occur, who to contact for more information and what precautions should be taken if necessary; and that the work-site be posted for safety reasons."

Damage to Improvements and Utilities 4.3.9 ***(add new clause 4.3.9 as follows)***
The *Contractor's* Work shall be confined to the *Owner's* premises, including statutory right-of-ways easements and construction permit limits, whenever possible. The *Contractor* shall not enter upon or place materials on other private premises except by written consent of the individual *Owners* and shall save the *Owner* harmless from all suits and actions of every kind and description that might result from use of private property.

Use of Working Site 4.3.10 ***(add new clause 4.3.10 as follows)***
The *Contractor* shall confine his equipment, storage of materials and operation of Work to the limits indicated by law, permits, or direction of the *Contract Administrator*, and shall not unreasonably encumber the premises with his materials. The *Contractor* shall comply with the *Contract Administrator* instructions regarding signs, advertisements, fires and smoking.

The working site shall at all times be kept free of rubbish and unnecessary hazards to persons, materials, and equipment.

Local, Emergency Traffic and Property Access 4.3.11 ***(add new clause 4.3.11 as follows)***
Local traffic shall be provided access to private properties at all times.

Emergency traffic such as Police, Fire, and Disaster Units shall be provided reasonable access at all times. The *Contractor* shall be liable for any damage which may result from his failure to provide such reasonable access.

Traffic Management Plan 4.3.12 ***(add new clause 4.3.12 as follows)***
The *Contractor* shall submit a Traffic Management Plan for Approval prior to start of construction in which the extent and duration of any road closures associated with the work are identified. Two-way traffic via one open lane shall be maintained on public roads at all times unless the *Contractor* has obtained the *Owner's* approval via a Road Closure Permit. The *Contractor* is cautioned that approval of full road closures is not guaranteed. Traffic control on all roads shall be in strict accordance with the Traffic Control Manual for Work on Roadways published by the Ministry of Transportation and Highways. The *Contractor* shall only use appropriately accredited personnel for Traffic Control.

Temporary Structures and Facilities	4.4.3	***(add new clause 4.4.3 as follows)*** The *Contractor* shall provide clean sanitary latrine accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the Ministry of Health and other bodies having jurisdiction. The *Contractor* shall permit no public nuisance.
Fair Wages	4.8.2	***(add new clause 4.8.2 as follows)*** The *Contractor* attests to compliance with Section 5 of the Skills Development and Fair Wage Act in projects where the provincial contribution to a Municipal project exceeds $250,000.
Truck Routes and Disposal Sites	4.17.1	***(add new clause 4.17.1 as follows)*** In hauling of material to and from the work site, the routes to be followed by trucks shall be confined to designated arterial and collector roads as shown on the road classification plan as issued by the City. Where a dumpsite can only be accessed by way of a local road, the route shall be the shortest possible way from an arterial or collector road, and shall be agreed to by the *Contract Administrator* in advance of the work. The *Contractor* shall be responsible for road cleanup along all trucking routes used in association with the work. The cost of this cleanup shall be paid by the *Contractor* and considered incidental to the work. It should be noted that a "Soil Deposition Permit" is required for any dumpsite within the City of Campbell River. The *Contractor* shall be responsible for obtaining and securing a legal dumpsite. All costs associated with that dumpsite shall be the responsibility of the *Contractor* and shall be considered incidental to the *Work.*
Disposal of Wood Debris, Organic Debris, and/or Waste Excavated Material	4.18.1	***(add new clause 4.18.1 as follows*)** Prior to disposal of any wood debris, organic debris and/or waste excavated material, the *Contractor* shall submit a disposal management strategy in accordance with all applicable Laws, Bylaws and Regulations to the *Contract Administrator* for approval. Subject to the *Contract Administrator's* approval, the *Contractor* shall ensure that all wood debris, organic debris and/or waste excavated material that is removed from the work site is managed in accordance with this approved disposal management strategy. The *Contractor* shall be required to employ acceptable methods of disposal, approved disposal site location(s), and shall be required to obtain and submit copies of all relevant permits and/or approvals prior to the disposal of any wood debris, organic debris and/or waste excavated material Regardless of the aforementioned, the *Owner* reserves the right to disallow any or all of the *Contractor*'s proposed disposal management strategy if it is determined that they will result in undesirable environmental impacts.
Daily Records	4.19.1	***(add new clause 4.19.1 as follows*)** The *Contractor* shall, for each *Day*, keep an accurate, complete and up-to-date record, in a form satisfactory to the *Contract Administrator*, showing, on a shift-by-shift basis, all *Contractor* and *Subcontractor* labour, equipment and material allocations on the project. The *Contractor* shall submit such resource allocation records to the *Contract Administrator* weekly, for the current week. This is in addition to the requirements of GC 10.3

OTHER CONTRACTORS	**6.0**	
Coordination and Connection	6.2.2	***(add new clause 6.2.2 as follows)*** If the performance of any Contract for the project is likely to be interfered with by the simultaneous execution of some other Contract or Contracts, the *Contract Administrator* shall decide which *Contractor* shall cease Work temporarily and which *Contractor* shall continue, or whether the Work under the Contracts can be coordinated so the Contracts may proceed simultaneously. The *Owner* shall not be responsible for any damages suffered or extra costs incurred by the *Contractor*, resulting directly or indirectly from the award or performance or attempted performance of any other Contract or Contracts on the project, or caused by any decision or omission of the *Contract Administrator* respecting the order of precedence in the performance of the Contracts other than for the extension of time.
VALUATION OF CHANGES AND EXTRA WORK	**9.0**	
Valuation Method	9.2.1.3	***(add new clause 9.2.1.3 as follows)*** Should a lump sum method be used for determination of the value of a *Change*, the *Contractor* shall determine the value of the *Change* by calculating the cost for each item contained within the *Change* and applying a 10% mark up on all costs associated with the *Change* for Overhead and Profit. All costs are required to be supported by documentation satisfactory to the *Contract Administrator* and all applicable rates are to be satisfactory to the *Contract Administrator.*
FORCE ACCOUNT	**10.0**	
Force Account Costs	10.1.1.4	***(delete 10.1.1.4 and replace as follows)*** *Force Account Work* performed by a *Subcontractor* shall be paid for in the lesser of: (i) the amount as provided by subparagraphs (1), (2) and (3) of this GC, plus a markup of 5%, or (ii) the actual amount the *Contractor* pays the *Subcontractor* including a markup of 10% on such actual cost to cover all overhead and profit.
DELAYS	**13.0**	
Liquidated Damages for Late Completion	13.9.1.1	**(*delete 13.9.1.1 and replace as follows***) as a genuine pre-estimate of the *Owner's* increased costs for the *Contract Administrator* and the *Owner's* own staff caused by such delay an amount of $1,000 per day or pro rata portion for each calendar day that actual *Substantial Performance* is achieved after the *Substantial Performance Milestone Date*; plus
PAYMENT	**18.0**	
Holdbacks	18.4.1	***(delete 18.4.1 and replace as follows)*** The *Owner* will retain a holdback but will not establish a Holdback Trust Account pursuant to Section 5 of the *Builders Lien Act.*

Substantial Performance	18.6.5	***(delete clause 18.6.5 and replace as follows)*** The *Owner* will release any builder's lien holdback on the 56th day following the date of *Substantial Performance*, or other date as required by law, but the *Owner* may holdback the amounts for any deficiencies or filed builders liens as provided in GC 18.4.2, GC 18.4.3 and 18.4.4, or the Maintenance Period Financial Security if not received by this date.
Payment Certifier	18.6.6	***(delete clause 18.6.6 and replace as follows)*** The *Contract Administrator*, as defined herein, shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of the *Contractor*, but not the *Work* of *Subcontractor*s. The *Contractor* shall co-operate with and assist the *Contract Administrator* by providing information and assistance in as timely manner as the *Contract Administrator* considers necessary to carry out the duties of the *Payment Certifier* for the Contract. The *Contractor* shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of each *Subcontractor*. Prior to certifying completion for a *Subcontractor*, the *Contractor* shall consult with the *Contract Administrator* and obtain the *Contract Administrator's* comments on the status of completion by the *Subcontractor,* including any deficiencies or defects in the *Subcontractor's Work* noted by the *Contract Administrator*. The *Contractor* will indemnify and save the *Owner* harmless from any and all liability the *Owner* may have to anyone arising out of the certification by the *Contractor* of *Substantial Performance* for that *Subcontractor.* Notwithstanding any other provision of the *Contract,* no payments will be due or owing to the *Contractor* so long as a Lien filed by anyone claiming under or through the *Contractor* remains registered against the Project or any lands, or interest therein, on which *Work* for the project was performed. Failure of the *Contractor* to remove all Liens promptly will entitle the *Owner* to damages.
WORKERS COMPENSATION REGULATIONS	**21.0**	
Contractor is "Prime Contractor"	21.2.2	***(add new clause 21.2.2 as follows)*** If the *Work* is being completed as part of a project for which the *Owner* already has a *Prime Contractor* designated then the *Contractor* will be responsible to ensure that they assume direction from the *Prime Contractor* as per the requirements of the Workers Compensation Act Part 3, Division 3, Section 118(1-3).
INSURANCE	**24.0**	
Required Insurance	24.1.7	***(add new clause 24.1.7 as follows)*** The *Contractor* shall ensure the following are additional named insured under this contract: • The City of Campbell River • Stantec Consulting Ltd. • Highland Engineering Services Ltd.

MAINTENANCE PERIOD	**25.0**	
Correction of Defects	25.1.4	***(add new clause 25.1.4 as follows)*** The *Owner* is authorized to make repairs to defects or deficiencies if, ten days after giving written notice, the *Contractor* has failed to make or undertake with due diligence the required repairs. However, in the case of emergency where, in the opinion of the *Owner*, delay is not reasonable, repairs may be made without notice being sent to the *Contractor.* All expenses incurred by the *Owner* in connection with repairs made pursuant to GC 25 shall be paid by the *Contractor* and may be deducted from the Maintenance Security, or other holdbacks. The *Contractor* shall promptly pay any shortfall.
Maintenance Period Financial Security	25.4.1	***(add new clause 25.4.1 as follows)*** within 10 days of the issue of the Certificate of substantial Performance deliver to the Owner, a Maintenance Period Financial Security in the form of cash, or a clean, irrevocable Letter of Credit in a form acceptable to the Owner in the amount of 5% of the Contract Price, issued by a major Canadian chartered bank which has a branch in Campbell River BC, payable to the Owner within the Maintenance Period.

Stantec Consulting Ltd.
500-4730 Kingsway, Burnaby BC V5H 0C6

December 11, 2017
File: 111720050

Attention: Jason Hartley, P.Eng.
City of Campbell River
301 St. Ann's Road
Campbell River, BC V9W 4C7

Dear Mr. Hartley,

Reference: Geotechnical Assessment Campbell River Waterfront Sewer Upgrade – Island Highway 19A, Campbell River, BC

INTRODUCTION

As authorized, Stantec Consulting Ltd. (Stantec) has completed a geotechnical assessment for a segment of the proposed gravity sewer section of the Campbell River Waterfront Sewer Upgrade project. The overall proposed gravity sewer will be approximately 1.3 km long, extending from 1st Avenue to the tie in point at Maritime Heritage Centre. Stantec's assessment focused on an approximately 200 m long segment of the proposed gravity sewer alignment (between Project Station 1+300 to 1+500) where the proposed sewer invert elevations and manhole installations would require excavations over 4 m deep during construction.

This letter summarizes the subsurface conditions encountered and presents the pertinent geotechnical considerations for construction of the proposed sewer.

SUBSURFACE CONDITIONS

SITE EXPLORATION

A geotechnical site exploration was carried out on November 14 and November 15, 2017 and consisted of 3 boreholes put down to depths ranging from 4.8 to 6.4 m below the existing road grade. The boreholes were all completed within the travel lanes of Island Highway 19A. The approximate locations of the boreholes are shown on Drawing 1 (attached).

The subsurface investigation began using solid stem augers; however, after cobblely and difficult drilling conditions were met, the drilling methodology was switched over to air-rotary (Odex) drilling technique. Soil samples were obtained from air return cuttings, and a split spoon sampler obtained while completing Standard Penetration Tests (SPT's).

Soil samples collected from the boreholes were returned to the Stantec geotechnical laboratory in Burnaby, BC for classification and index testing. Soil descriptions presented on the borehole logs are based on the grab samples and SPT split spoon samples collected at discrete intervals, and are in general accordance with ASTM D2487 and D2488 for the Unified Soil Classification System

(USCS) and the information presented on the attached "Symbols and Terms Used in Borehole and Test Pit Records".

SOIL CONDITIONS

In general, the soil conditions encountered at the borehole locations consisted of a variable thickness of granular fill, underlain by dense to very dense sand with variable silt content (ranging from trace amounts to being silty). The subsurface soil strata and groundwater conditions encountered in the boreholes are described in detail in the attached Borehole Records, and summarized in the sections below.

Fill

Beneath the asphalt pavement, granular fill consisting of sand with silt and gravel was encountered in boreholes BH17-01 to BH17-03 ranging from approximately 100 to 660 mm thick. Below the sand fill layer, gravel fill with variable silt content was encountered in boreholes BH17-01 and BH17-02. The gravel fill layer contained frequent cobbles (around 100 mm in diameter), which resulted in auger refusal. Grain size analyses were completed on samples of the gravel fill obtained from boreholes BH17-01 and BH17-02.

Sand / Silty Sand

Beneath the granular fill layers, dense to very dense sand and silty sand was encountered in boreholes BH17-01, BH17-02 and BH17-03. SPT's were attempted within the sand and silty sand unit in all three boreholes at select depths, and only partial penetration was achieved (between 50 to 100 mm of penetration), prior to refusing. All boreholes were terminated within this unit.

Groundwater Conditions

Upon completion of each borehole, the groundwater level was measured in the open boreholes. Groundwater levels were measured to be 2.7 m and 2.1 m below the existing ground surface in boreholes BH17-01 and BH17-03, respectively. No groundwater was encountered in borehole BH17-02. It should be noted that the boreholes were fully cased at the time of the measurements.

EXCAVATION CONSIDERATIONS

Due to the potential for variation in ground conditions between boreholes, the width of the existing roads, and the proximity of existing infrastructure, we envisage that open cut excavation trenches for the sewers would require the use of temporary excavation support. The excavation support should be continuous. Potential for soil sloughing, erosion, sand boiling and groundwater flow exist in excavation supports which are not continuous.

Reference: Geotechnical Assessment Campbell River Waterfront Sewer Upgrade – Island Highway 19A, Campbell River, BC

Due to the presence of existing utility trenches adjacent to the proposed sewer alignment, it is possible that the proposed excavations may encounter trench backfill material including loose granular and/or poor quality fills from previous utility installations. Trench support should be considered for these locations to prevent excessive sloughing of existing backfill materials and movement of existing underground utilities. However, even when temporary shoring is used sloughing of granular soils and groundwater seepage should be anticipated.

The temporary shoring should be designed by the Contractor's Geotechnical Engineer based on consideration of the anticipated soil conditions, as well as the proximity of the trench to, and movement tolerance of, any adjacent utilities and structures. The Contractor could fill voids between the temporary shoring and excavated trench walls with granular fill or controlled-density fill to mitigate sloughing of soils and movement of any sensitive infrastructure during construction.

All excavations should be carried out in accordance with Part 20 of the current WorkSafeBC regulations (WorkSafeBC, 2013) and be safe for worker entry. Sloping and/or shoring is required for temporary excavations greater than 1.2 m in depth.

GROUNDWATER CONSIDERATIONS

As standing groundwater levels measured in boreholes BH17-01 and BH17-03 could be in the order of 1.4 to 1.6 m above the proposed manhole and pipe invert elevations, conventional sumps and pumps may not be adequate to maintain a dry excavation. As such, a well- point system may be required for the sewer and manhole installation and to maintain trench slope stability.

Stantec anticipates that the groundwater conditions along the proposed sewer alignment will vary seasonally and where possible, construction of the deeper sections should be planned for the summer months when drier weather is expected.

BACKFILLING CONSIDERATIONS

Based on our review, some of the granular fill encountered in the boreholes could potentially be re-used as general trench backfill material. However, due to the variability in silt content, all proposed backfill material would need to be reviewed on a case by case basis and approved by a geotechnical engineer prior to reuse. Similarly, the native sand can potentially be reused as general trench backfill; however, it would have to be separated from the native silty sand, reviewed and then be approved prior to reuse.

Furthermore, as the site exploration was focused on a short segment of the proposed sewer, variation of fill material could be encountered in other sections of the proposed sewer alignment.

Reference: Geotechnical Assessment Campbell River Waterfront Sewer Upgrade – Island Highway 19A, Campbell River, BC

CLOSURE

This report was prepared for the exclusive use of the City of Campbell River and its agents for specific application to the Waterfront Sewer System Upgrade project. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved in writing by Stantec. Stantec should be notified in writing of any changes to the proposed design in order that we may review our design recommendations and advise of any revisions, if necessary.

Use of this report is subject to the Statement of General Conditions (attached). It is the responsibility of the City of Campbell River, who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec should any of them not be satisfied. The Statement of General Conditions addresses the following:

- Use of the report
- Basis of the report
- Standard of care
- Interpretation of site conditions
- Varying or unexpected site conditions
- Planning, design, or construction

We trust that the information contained herein meets your requirements at this time. Should you have any questions, or if we can be of further assistance, please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

PROFESSIONAL ENGINEER
B. HUYNH
#35705
BRITISH COLUMBIA

Dec 11, 17

Ben Huynh, P.Eng.
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Wayne Quong, M.A.Sc., P.Eng.
Senior Associate, Geotechnical
Phone: (778) 838-9877
wayne.quong@stantec.com

Attachment:

Statement of General Conditions
Test Hole Location Plan
Borehole Logs and Laboratory Test Results

Stantec

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec's present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec will not be responsible to any party for damages incurred as a result of failing to notify Stantec that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.

Stantec

Project Information	
Project No.:	111720050
Scale:	1:1500
Date:	2017-NOV-27
Drawn by:	G. HUYNH
Checked by:	C. HAJEN

Project Location
ISLAND HIGHWAY
CAMPBELL RIVER, BC

Client/Project
CITY OF CAMPBELL RIVER

CAMPBELL RIVER WATERFRONT
SEWERS UPGRADE

Title
BOREHOLE LOCATION PLAN - GRAVITY SEWER

Dwg No.
1

ORIGINAL SHEET - ANSI A

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Rootmat	- vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
Topsoil	- mixture of soil and humus capable of supporting vegetative growth
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating successions of different soil types, e.g. silt and sand
Layer	- > 75 mm in thickness
Seam	- 2 mm to 75 mm in thickness
Parting	- < 2 mm in thickness

Terminology describing soil types:
The classification of soil types are made on the basis of grain size and plasticity in accordance with the Prairie Farm Rehabilitation Association (PFRA) Modified version of the Unified Soil Classification System (USCS) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. See page 4 for definitions and other details.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):
Terminology describing materials outside of the PFRA Modified version of the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 20%

Terminology describing compactness of cohesionless soils:
The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

Terminology describing consistency of cohesive soils:
The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Shear Strength		Approximate SPT N-Value
	kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25 - 0.5	12.5 – 25	2-4
Firm	0.5 - 1.0	25 – 50	4-8
Stiff	1.0 - 2.0	50 – 100	8-15
Very Stiff	2.0 - 4.0	100 – 200	15-30
Hard	>4.0	>200	>30

ROCK DESCRIPTION

Except where specified below, terminology for describing rock is as defined by the International Society for Rock Mechanics (ISRM) 2007 publication "The Complete ISRM Suggested Methods for Rock Characterization, Testing and Monitoring: 1974-2006"

Terminology describing rock quality:

RQD	Rock Mass Quality
0-25	*Very Poor Quality*
25-50	*Poor Quality*
50-75	*Fair Quality*
75-90	*Good Quality*
90-100	*Excellent Quality*

Alternate (Colloquial) Rock Mass Quality	
Very Severely Fractured	*Crushed*
Severely Fractured	*Shattered or Very Blocky*
Fractured	*Blocky*
Moderately Jointed	*Sound*
Intact	*Very Sound*

RQD (Rock Quality Designation) denotes the percentage of intact and sound rock retrieved from a borehole of any orientation. All pieces of intact and sound rock core equal to or greater than 100 mm (4 in.) long are summed and divided by the total length of the core run. RQD is determined in accordance with ASTM D6032.

SCR (Solid Core Recovery) denotes the percentage of solid core (cylindrical) retrieved from a borehole of any orientation. All pieces of solid (cylindrical) core are summed and divided by the total length of the core run (It excludes all portions of core pieces that are not fully cylindrical as well as crushed or rubble zones).

Fracture Index (FI) is defined as the number of naturally occurring fractures within a given length of core. The Fracture Index is reported as a simple count of natural occurring fractures.

Terminology describing rock with respect to discontinuity and bedding spacing:

Spacing (mm)	Discontinuities	Bedding
>6000	*Extremely Wide*	-
2000-6000	*Very Wide*	*Very Thick*
600-2000	*Wide*	*Thick*
200-600	*Moderate*	*Medium*
60-200	*Close*	*Thin*
20-60	*Very Close*	*Very Thin*
<20	*Extremely Close*	*Laminated*
<6	-	*Thinly Laminated*

Terminology describing rock strength:

Strength Classification	Grade	Unconfined Compressive Strength (MPa)
Extremely Weak	R0	<1
Very Weak	R1	1 – 5
Weak	R2	5 – 25
Medium Strong	R3	25 – 50
Strong	R4	50 – 100
Very Strong	R5	100 – 250
Extremely Strong	R6	>250

Terminology describing rock weathering:

Term	Symbol	Description
Fresh	W1	No visible signs of rock weathering. Slight discoloration along major discontinuities
Slightly	W2	Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discolored.
Moderately	W3	Less than half the rock is decomposed and/or disintegrated into soil.
Highly	W4	More than half the rock is decomposed and/or disintegrated into soil.
Completely	W5	All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact.
Residual Soil	W6	All the rock converted to soil. Structure and fabric destroyed.

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Meta-morphic Bedrock | Sedi-mentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
WS	Wash sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use of standard size diamond coring bits.

WATER LEVEL MEASUREMENT

measured in standpipe, piezometer, or well

inferred

RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (305 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

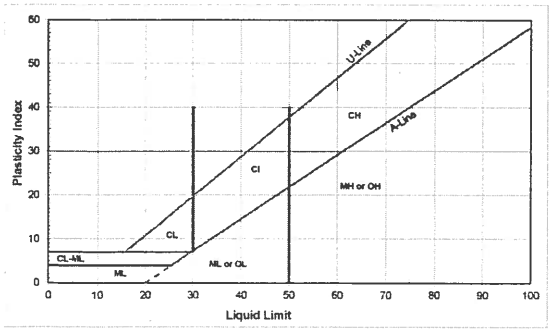
S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
γ	Unit weight
G_s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q_u	Unconfined compression
I_p	Point Load Index (I_p on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE GRAINED SOILS	GRAVELS (MORE THAN HALF COARSE GRAINS LARGER THAN 4.75 mm)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4;\ C_c = \frac{(D_{30})^2}{D_{10}\ x\ D_{60}} = 1\ to\ 3$	
			GP	POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS	
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW 'A' LINE OR P.I. LESS THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE 'A' LINE OR P.I. MORE THAN 7
	SANDS (MORE THAN HALF COARSE GRAINS SMALLER THAN 4.75 mm)	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6;\ C_c = \frac{(D_{30})^2}{D_{10}\ x\ D_{60}} = 1\ to\ 3$	
			SP	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS	
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXUTRES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW 'A' LINE OR P.I. LESS THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE 'A' LINE OR P.I. MORE THAN 7
FINE GRAINED SOILS	SILTS (BELOW 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 50$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW)	
		$W_L > 50$	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS		
	CLAYS (ABOVE 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 30$	CL	INORGANIC CLAYS OF LOW PLASTICITY GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS		
		$30 < W_L < 50$	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS		
		$W_L > 50$	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	Note: WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER 'F'. E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY	
	ORGANIC SILTS & CLAYS (BELOW 'A' LINE)	$W_L < 50$	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
		$W_L > 50$	OH	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOR, AND OFTEN FIBROUS TEXTURE	
BEDROCK			BR	SEE REPORT DESCRIPTION		

NOTE: BOUNDARY CLASSIFICATION POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%.



NOTE: PLASTICITY CHART IS FOR SOILS PASSING 425 µm SIEVE

SOIL COMPENENTS BY PARTICLE SIZE DISTRIBUTION

FRACTION		SIEVE SIZE (mm)		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
		PASSING	RETAINED	PERCENT	IDENTIFIER
GRAVEL	COARSE	75	19	50 – 35	AND
	FINE	19	4.75		
SAND	COARSE	4.75	2.00	35 - 20	____Y/EY
	MEDIUM	2	0.425		
	FINE	0.425	0.075	20 - 10	SOME
SILT (non-plastic) OR CLAY (plastic)		0.075		10 – 1	TRACE

OVERSIZE MATERIALS	
ROUNDED OR SUB-ROUNDED COBBLES 75 mm to 200 mm BOULDERS > 200 mm	ANGULAR ROCK FRAGMENTS ROCKS > 0.75 m^3 IN VOLUME

NOTE: ALL SIEVE SIZES ARE REFERENCED TO U.S. STANDARD ASTM E.11 - ALTERNATE EQUAVALENT METRIC SIEVE SIZES IN ACCORDANCE WITH CGSB SPEC. 8-GP-2M TO APPLY WHEN PRESCRIBED

BOREHOLE RECORD

BH17-01

CLIENT City of Campbell River | DATUM Geodetic | PROJECT No. 111720050
PROJECT Waterfront Sewer System Upgrades | ELEVATION 21 m | NORTHING 5542645
LOCATION Campbell River, BC | DRILL RIG Mobile B47 Track | EASTING 339882
DRILLING DATE 11/15/2017 | DRILLING CO. BlueMax Drilling Inc. | DRILLING METHOD Auger/ODEX

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	FL		FILL: brown well graded sand with silt and gravel - traces of silt - DCPT refusal at 0.1 m: 50 blows in 200 mm	GS	1	
1	FL		FILL: brown poorly graded gravel with sand - frequent cobbles - sieve test at 0.9 m: gravel= 70%; sand= 28%; silt= 2% - auger refusal at 1.1 m on inferred cobbles - DCPT refusal at 1.2 m: 50 blows in 100 mm	GS	2	
2						
▽	FL		FILL: grey well graded GRAVEL (GW) - traces of silt and sand - occasional inferred cobbles	SPT	3	
3						
4	SW		Very dense grey well graded SAND (SW) with gravel - occasional inferred cobbles - inferred boulder, 5.2 to 5.4 m - SPT refusal at 4.3 m: 50 blows in 50 mm	GS	4	
				SPT	5	
5				GS	6	
6			- fines at 6.1 m= 5%	SPT	7	9
			End of BH17-01 at 6.4 m Drilled to 1.1 m with auger until refusal; moved 1 m north; completed borehole using ODEX method Water level measured at 2.7 m in open borehole DCPT conducted at 0.1 m and 1.2 m			
7						

☐ Insitu Shear Vane (kPa) ■ Remoulded Shear Vane (kPa)
△ Pocket Penetrometer (kPa) ✖ Disturbed Torvane (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Blow Count/0.3m

10 20 30 40 50 60 70 80 90

15

80

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube CC - Continuous Core

Piezometer Backfill Type: Bentonite Sloughed Drill Cuttings Sand

Logged by: CH
Reviewed by: BH
Date: Nov. 20, 2017

Stantec

BOREHOLE RECORD

BH17-02

CLIENT City of Campbell River | DATUM Geodetic | PROJECT No. 111720050

PROJECT Waterfront Sewer System Upgrades | ELEVATION 23.5 m | NORTHING 5542528

LOCATION Campbell River, BC | DRILL RIG Mobile B47 Track | EASTING 339918

DRILLING DATE 11/15/2017 | DRILLING CO. BlueMax Drilling Inc. | DRILLING METHOD Auger/ODEX

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	FL		FILL: grey-brown well graded sand with silt - traces of gravel			
1			FILL: grey silty gravel with sand - frequent cobbles	GS	1	
	FL					
			- sieve test at 1.5 m: gravel= 43%; sand= 43%; silt= 14%	GS	2	
2			- auger refusal at 2.0 m on inferred cobbles			
			Very dense grey SILTY SAND (SM) with gravel			
3	SM		- SPT refusal at 3.0 m: 50 blows in 75 mm - fines at 3.0 m= 26%	SPT	3	9
			Very dense grey-brown poorly graded SAND with silt (SP-SM) - traces of gravel	GS	4	
4						
			- SPT refusal at 4.6 m: 50 blows in 50 mm	SPT	5	
5	SP SM			GS	6	
6				SPT	7	
	SM		Very dense grey SILTY SAND (SM) with gravel - SPT refusal at 6.1 m: 50 blows in 100 mm			
			End of BH17-02 at 6.3 m Drilled to 2.0 m with auger until refusal; moved 1 m north; completed borehole using ODEX method No groundwater observed in open borehole			
7						

□ Insitu Shear Vane (kPa) ■ Remoulded Shear Vane (kPa)
△ Pocket Penetrometer (kPa) ✖ Disturbed Torvane (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Blow Count/0.3m

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube CG - Continuous Core

Piezometer Backfill Type: Bentonite Sloughed Drill Cuttings Sand

Logged by: CH
Reviewed by: BH
Date: Nov. 20, 2017

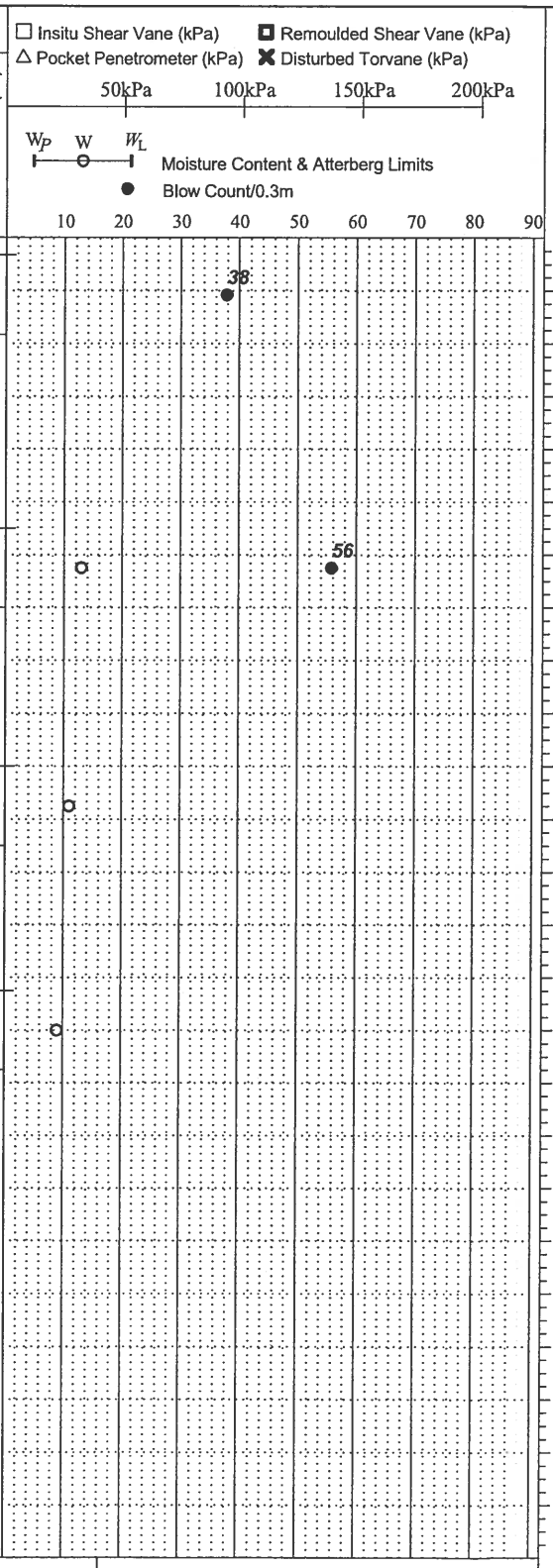
Stantec

BOREHOLE RECORD

BH17-03

CLIENT City of Campbell River | DATUM Geodetic | PROJECT No. 111720050
PROJECT Waterfront Sewer System Upgrades | ELEVATION 24.5 m | NORTHING 5542402
LOCATION Campbell River, BC | DRILL RIG Mobile B47 Track | EASTING 339932
DRILLING DATE 11/15/2017 | DRILLING CO. BlueMax Drilling Inc. | DRILLING METHOD ODEX

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES MOISTURE CONTENT (%)
0	AS		ASPHALT			
	FL		FILL: brown silty sand with gravel - faint organic odour	SPT	1	
1			Dense to very dense grey-brown SILTY SAND (SM) with gravel			
2				SPT	2	13
			- traces of gravel below 2.1 m			
	SM					
3			- SPT refusal at 3.0 m: 50 blows in 100 mm - very dense below 3.0 - fines at 3.0 m= 31%	SPT	3	11
4						
				SPT	4	9
			- SPT refusal at 4.6 m: 50 blows in 75 mm - fines at 4.6 m= 29%			
5			End of BH17-03 at 4.8 m Groundwater measured in open borehole at 2.1 m			
6						
7						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube CC - Continuous Core

Piezometer Backfill Type: Bentonite Sloughed Drill Cuttings Sand

Logged by: CH
Reviewed by: BH
Date: Nov. 20, 2017

Stantec

Stantec

Grain Size Analysis
ASTM C136, ASTM C117

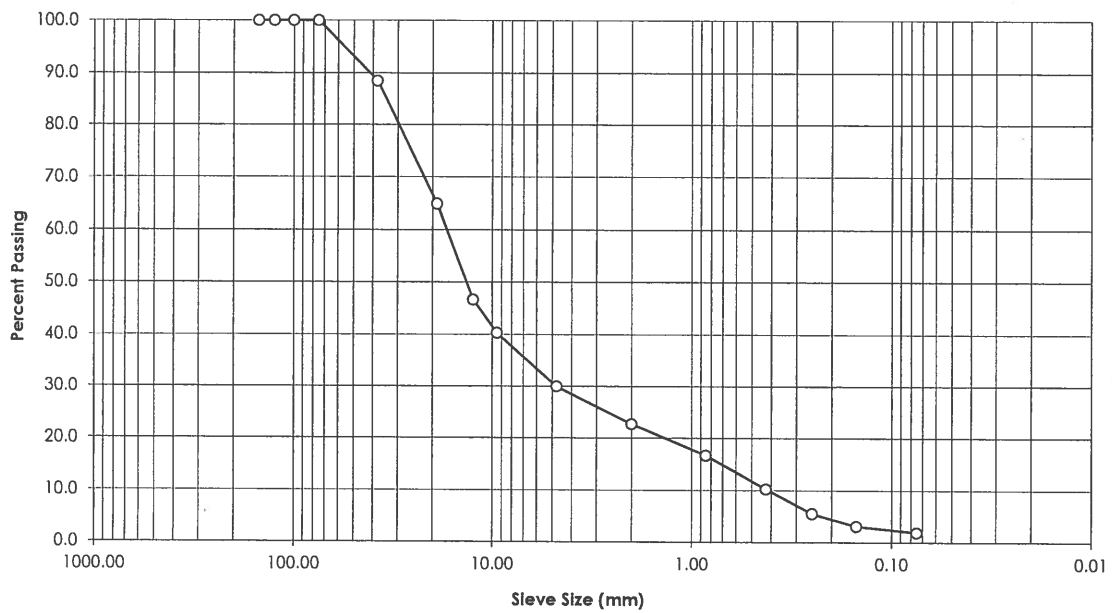
Client: City of Campbell River
Project Name: Waterfront Sewer System Upgrades
Project No: 111720050

OFFICE
4730 Kingsway
Suite 500
Burnaby, BC
Canada V5H 0C6
Tel: (604) 436-3014

LABORATORY
3711 North Fraser Way
Suite 400
Burnaby, BC
Canada V5J 5J2
Tel: (604) 436-3014

SAMPLE No.: GS2
SOURCE: BH17-01
TESTED BY: JN

DATE RECEIVED: Novemeber 19, 2017
DATE TESTED: November 22, 2017
SAMPLE DESCRIPTION: Brown poorly-graded GRAVEL with sand



Sieve (mm)	Sample % Passing	Specifications Lower	Specifications Upper
0.0	100.0	-	-
0.0	100.0	-	-
0.0	100.0	-	-
150.0	100.0	-	-
125.0	100.0	-	-
100.0	100.0	-	-
75.0	100.0	-	-
38.0	88.5	-	-
19.0	64.8	-	-
12.5	46.6	-	-
9.5	40.3	-	-
4.75	30.0	-	-
2.00	22.7	-	-
0.85	16.7	-	-
0.425	10.3	-	-
0.250	5.5	-	-
0.150	3.1	-	-
0.075	1.9	-	-

Cobble:	0.0%	D_{10}:	0.4180
Gravel:	70.0%	D_{30}:	4.7657
Sand:	28.1%	D_{60}:	17.4740
Fines:	1.9%	C_u:	41.81
		C_c:	3.11

Comments:

Reviewed by:
BH

Stantec

Grain Size Analysis

ASTM C136, ASTM C117

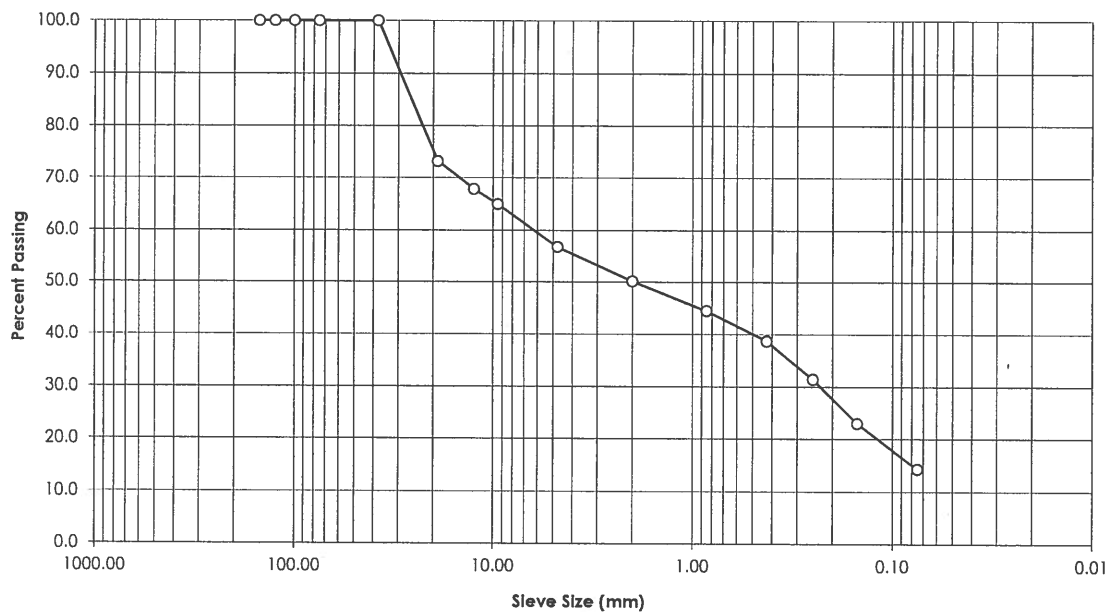
Client: City of Campbell River
Project Name: Waterfront Sewer System Upgrades
Project No: 111720050

OFFICE
4730 Kingsway
Suite 500
Burnaby, BC
Canada V5H 0C6
Tel: (604) 436-3014

LABORATORY
3711 North Fraser Way
Suite 400
Burnaby, BC
Canada V5J 5J2
Tel: (604) 436-3014

SAMPLE No.: GS2
SOURCE: BH17-02
TESTED BY: JN

DATE RECEIVED: Novemeber 19, 2017
DATE TESTED: November 22, 2017
SAMPLE DESCRIPTION: Grey SILTY GRAVEL with sand



Sieve (mm)	Sample % Passing	Specifications Lower	Specifications Upper
0.0	100.0	-	-
0.0	100.0	-	-
0.0	100.0	-	-
150.0	100.0	-	-
125.0	100.0	-	-
100.0	100.0	-	-
75.0	100.0	-	-
38.0	100.0	-	-
19.0	73.2	-	-
12.5	67.9	-	-
9.5	65.0	-	-
4.75	56.8	-	-
2.00	50.1	-	-
0.85	44.5	-	-
0.425	38.7	-	-
0.250	31.4	-	-
0.150	23.0	-	-
0.075	14.3	-	-

Cobble:	0.0%	D_{10}:	-
Gravel:	43.2%	D_{30}:	0.2352
Sand:	42.4%	D_{60}:	6.6950
Fines:	14.4%	C_u:	-
		C_c:	-

Comments:

Reviewed by:
BH

SUPPLEMENTARY SPECIFICATIONS

TO BE READ IN CONJUNCTION WITH THE
"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS"

Reference No.: **TENDER 18-13**

Contract: **WATERFRONT SEWER UPGRADES PHASE I**

General

1.1 a) Payments will be made on the basis of the unit prices bid in the Tender, and in accordance with Article 18 of the General Conditions.

b) The unit prices bid, unless specifically noted otherwise, shall include the supply of all *LABOUR*, *PLANT, MATERIAL* and *PRODUCT* equipment necessary to construct *THE WORK* in accordance with the specifications.

c) The prices bid for supply and installation shall be full compensation for supplying, hauling, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

d) Other materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated or piled materials, are the property of the *OWNER* or of the owner of the land on which *THE WORK* is located. Only those materials specifically noted in the specification or on drawings, as belonging to the *CONTRACTOR* shall become the *CONTRACTOR'S* property.

e) Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in *THE WORK*, such materials are not the property of the *CONTRACTOR* unless authorized in writing by the *CONTRACT ADMINISTRATOR* or specified to be disposed of by the *CONTRACTOR*.

Unit Price Contracts

2.1 a) Payments will be made on the basis of the following:

.1 Unit Price items in the Schedule of Quantities and Unit Prices.

.2 Changes in *THE WORK* for items not covered by unit prices, in accordance with Article 7 - *CHANGES IN THE WORK* of the General Conditions.

b) For each item in the Schedule of Quantities and Unit Prices, the *Contract Administrator* will, in cooperation with the *Contractor*, measure the quantity of the item completed at the end of the payment period and this will be shown as a percentage of the work completed against the appropriate value for the lump sum assigned to the respective line item.

Mobilization and Demobilization 3.1

a) Mobilization and demobilization shall include the *Contractor's* costs of mobilization at the beginning of the project; and the costs of demobilization at the end of the project.

b) Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities, First-Aid, Site Safety, temporary utilities and all preparation for performing *THE WORK*.

c) Included in demobilization are preparation and submission of operation and maintenance manuals, As-Constructed Record Drawings, comprehensive Bill Of Materials, removal of all personnel, materials and equipment; and cleanup of the site and *THE WORK*.

d) The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the Tender Price.

e) Payment will be made as follows, as approved by the *CONTRACT ADMINISTRATOR*:

I. 60% of the lump sum bid will be included in the first progress payment certificate;
II. 40% of the lump sum bid will be included in the final progress payment certificate.

The *CONTRACT ADMINISTRATOR* may at his discretion recommend partial payment if mobilization or demobilization is not complete.

Dust Control 4.1

During the performance of *THE WORK*, the *CONTRACTOR* is to at all times keep the worksite and such immediate surrounding areas which it may utilize free from waste materials, debris or rubbish and is to employ adequate dust control measures. Water shall be the only material acceptable for dust suppression. If accumulation of such materials, debris, rubbish or dust constitutes a nuisance or safety hazard or is otherwise objectionable in any way, as reasonably determined by the *OWNER* or *CONTRACT ADMINISTRATOR*, the *CONTRACTOR* is to promptly remove it. If any claim, suit, losses, or action is brought by a person affected by the transportation of materials, equipment, goods or wastes to and from the worksite, the *CONTRACTOR* shall defend, indemnify and hold harmless all indemnified parties.

Underground Utilities 5.1

It is the *CONTRACTOR'S* responsibility wherever necessary to determine location of existing pipes, valves, conduits, vaults, or

other underground structures. Wherever it is necessary to explore and excavate to determine the location of the existing underground structures, the *CONTRACTOR,* at his own expense, shall make explorations and excavations for such purposes. The *CONTRACTOR* shall notify the *CONTRACT ADMINISTRATOR* or his representative of any conflicts.

The *CONTRACTOR* shall, at his own expense, provide for the uninterrupted flow of all watercourses, sewers, drains, and any other utility encountered during the work. Water control and siltation control shall be under the direction of a qualified environmental monitor engaged by the *CONTRACTOR*.

When any existing mains and/or service pipes, utility ducts, vaults or other utility structures are encountered, the *CONTRACTOR* shall support them to the satisfaction of the *CONTRACT ADMINISTRATOR* so as to protect them from injury. The *CONTRACTOR* shall, at his own expense, at once repair and make good any injury which may occur to any mains, service or utility pipes or ducts, or facilities, or to any electrical conductor, telephone, cable or natural gas facility or to any sidewalk, crosswalk as a result of this operation.

Support of power, telephone poles, underground mains, wiring and light standards required to complete the work, shall be the responsibility of the *CONTRACTOR* and completed in accordance with utility company standards. The *CONTRACTOR* shall schedule the work with the appropriate utility company in advance, so as not to delay the work. All costs associated with the work shall be considered incidental and no separate payment be made for this item.

Construction Surveys

6.1 The *CONTRACTOR is responsible for all survey layout, including stakes, hubs, and grade control*.

The *CONTRACTOR* shall survey and layout the work including, but not limited to, as-built invert elevations, offsets and stations of all grade changes, miscellaneous appurtenances, and all existing utilities exposed during construction.

The *CONTRACTOR* shall provide all stakes, hubs, nails, flagging, and including the supply of casual labour for checking of the work, as required by the *CONTRACT ADMINISTRATOR*.
The *CONTRACTOR* shall provide the *CONTRACT ADMINISTRATOR* with records of the actual surveys, and “as-built” information pick-up.

No separate or additional payment will be made for this work.

General Coordination

7.1 The *CONTRACTOR* shall work cooperatively with B.C. Hydro, Telus, Shaw and Fortis to locate private utility ducting.

No additional payment shall be made for this work.

Supplementary Specifications

8.1 The following Supplementary Specifications are complementary to the MMCD.

Section	Title
01 01 01	Mobilization and Demobilization
01 31 00	Construction Schedule and Progress Reports
01 34 00	Shop Drawings and Product Date
01 40 00	Quality Control
01 53 01	Temporary Facilities
01 55 00	Traffic Control, Vehicle Access & Parking
01 57 01	Environmental Protection
01 73 00	Operating and Maintenance Data
03 30 20	Concrete Walks, Curbs and Gutters
03 30 55	Precast Interlock Blocks
31 22 16	Reshaping Granular Roadbeds
31 23 01	Excavating, Trenching and Backfilling
31 23 23	Controlled Density Fill
32 11 23	Granular Base
32 12 16	Hot-Mix Asphalt Concrete Paving
32 93 01	Planting of Trees, Shrubs and Ground Cover
33 30 10	Carbon Odour Control Unit
33 30 20	Odour Control FRP Fan
33 34 01	Sewage Forcemains

1.0 GENERAL

.1 SS Section 01 01 01 refers to specific portions of the work not addressed elsewhere within the specifications. Section includes Mobilization and Demobilization.

1.1 MEASUREMENT AND PAYMENT

.1 Mobilization and demobilization shall include the *Contractor's* costs of mobilization at the beginning of the project; and the costs of demobilization at the end of the project.

.2 Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities and all preparation for performing the *Work*.

.3 Included in demobilization are preparation and submission of operation and maintenance manuals, removal of all personnel, materials and equipment, and cleanup of the site and the *Work*.

.4 The lump sum price bid for this work shall be relative to the costs involved but **shall not exceed ten percent (10%) of the Total Price (excluding GST)**.

.5 Payment will be made as follows, as approved by the *Contract Administrator*.

.1 60% of the quotation bid will be included in the first progress payment certificate;

.2 40% of the quotation bid will be included in the final progress payment certificate.

.3 The *Contract Administrator* may at his discretion recommend partial payment if mobilization or demobilization are not complete.

2.0 PRODUCTS

Not Used

3.0 EXECUTION

Not Used

1.0 GENERAL

1.1 Description

.1 Prepare a time-scaled network schedule using the critical path method. The schedule will provide a basis for determining the progress status of the project relative to the completion time and specific dates and for determining the acceptability of the *CONTRACTOR*'s requests for payment.

1.2 Schedules

.1 Depict all significant construction activities, shop drawing submittals and procurement activities. Show the dependencies between activities so that it may be established what effect the progress of any one activity has on the schedule. Except for the start and finish milestones / activities each task shall have a successor and predecessor dependency.

.2 Show completion time and all specific dates and sequencing requirements. Identify activities making up the critical path.

.3 Unless specifically approved by the *CONTRACT ADMINISTRATOR*, show activities on the schedule with a duration not longer than 15 working days or an assigned value not greater than $100,000 (except activities showing only submittal, fabrication or delivery of material or equipment). Divide activities which exceed these limits into more detailed components. Base the scheduled duration of each activity on the work being performed during the normal 40-hour work week with allowances made for legal holidays and normal weather conditions.

1.3 Submittals for Review

.1 Within 10 days of the Notice of Award submit a construction schedule as specified herein showing in detail all procurement and on-site construction activities.

.2 The *CONTRACT ADMINISTRATOR* will review the submitted schedule within 14 working days of its receipt. If the *CONTRACT ADMINISTRATOR* finds that the submitted schedule does not comply with the specified requirements, or does not provide an acceptable schedule detail, the deficiencies will be identified in writing to the *CONTRACTOR* for correction and re-submittal. Correct and resubmit the schedule within 10 working days after the deficiencies have been identified by the *CONTRACT ADMINISTRATOR*. The accepted schedule will become the project baseline schedule for tracking construction progress.

1.4 Schedule Revisions

.1 Submit proposed revisions to the accepted construction schedule to the *CONTRACT ADMINISTRATOR* for review. Changes in timing for activities may be modified with agreement of the *CONTRACTOR* and *CONTRACT*

ADMINISTRATOR. A change affecting the Contract Price, the completion time, or work sequencing may be made only by approved change order.

.2 Add separate activities to the construction schedule for each approved change order.

.3 Should the actual sequence of work performed by the *CONTRACTOR* deviate from the planned sequence indicated in the accepted schedule, the *CONTRACT ADMINISTRATOR* may require the *CONTRACTOR* to revise the schedule to reflect changes in the actual sequence and/or the future sequence of work.

.4 Within 20 days following approval of the *CONTRACTOR*'s testing and commissioning plan submit a schedule revision incorporating the approved plan into the construction schedule.

.5 Submit with each schedule revision all information as called for in submitting the original construction schedule.

1.5 Progress Status Update

.1 Submit an updated schedule on a monthly basis concurrent with the submittal of the progress payment request. Indicate on the updated schedule progress achieved to date on all activities.

.2 Submit three-week lookahead schedules for review and discussion at each weekly project meeting.

2.0 PRODUCTS

.1 Not Used

3.0 EXECUTION

.1 Not Used

END OF SECTION 01 31 00S

1.0 GENERAL

.1 This section specifies general requirements and procedures for Contractors submissions of shop drawings, product data, samples and mock-ups to Engineer for review.

.1 Additional specific requirements for submissions are specified in individual sections.

.2 Do not proceed with work until relevant submissions are reviewed by Engineer.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

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

.5 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.

.6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

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

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

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

1.1 RELATED REQUIREMENTS

.1 Section 01 30 00 - Submittals.

1.2 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 Allow ten (10) days for Engineer’s review of each submission.

.3 Accompany submissions with transmittal letter, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.4 Submissions shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Failure to include will result in drawings being stamped “Not Reviewed” and returned to the contractor.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring and control diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.6 After Engineer's review distribute copies as required.

1.3 PRODUCT DATA

1.3.1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts/curves and diagrams, for each product, system or piece of equipment used to illustrate standard manufactured products. Ensure that the exact model number is shown and highlighted on the shop drawings.

.2 Submit one (1) copy of product data. Contractor to make copies of all reviewed drawings including the review notes and stamped cover page for O&M manuals.

.3 Sheet size: 215 x 280 mm, maximum of three (3) modules.

.4 Delete information not applicable to project from all catalogue data and highlight on any tables the exact product supplied. Shop drawings will be returned "REJECTED" if it is not clearly marked on catalogue data which equipment and accessories are being supplied.

.5 Supplement standard information to provide details applicable to project.

.6 Cross-reference product data information to applicable portions of Contract Documents.

2.0 PRODUCTS

Not Used

3.0 EXECUTION

Not Used

1.0 GENERAL

1.1 REQUIREMENTS INCLUDED

.1 Inspection and testing, administrative and enforcement requirements.

.2 Testing and mix designs.

.3 Commissioning and testing of diaphragm pump & pipe system

.4 Geotechnical testing of backfill materials and compaction testing.

1.2 INSPECTION SERVICES

.1 The Owner and the Engineer shall have access to the Work. If parts of the Work are in preparation at locations other than the Place of the Work, access shall be given to such work whenever it is in progress.

.2 Give timely notice (1-week advanced notice with 2 business days (48hrs) confirmation prior) requesting inspection if Work is designated for special tests, inspections or review by Engineer's instructions, or the law of the Place of the Work.

.3 If the Contractor covers or permits to be covered Work that has been designated for special tests, inspections or reviews before such is made, uncover such Work, have the inspections or tests satisfactorily completed and make good such Work at the Contractors expense.

.4 The Engineer may order any part of the Work to be examined if such work is suspected to be not in accordance with the Contract Documents. If, upon examination, such work is found not in accordance with the Contract Documents, correct such work and pay the cost of examination and correction. If such Work is found in accordance with the Contract Documents, the Owner shall pay the cost of examination and replacement.

1.3 QUALITY ASSURANCE TESTING BY OWNER

.1 Independent Inspection/Testing Agencies may be engaged by the Owner for the purpose of inspecting and/or testing portions of Work to confirm that specific requirements for materials and workmanship are being met. The Owner is not responsible for ensuring Contractors' Quality Control.

.2 Provide equipment required for executing inspection and testing by the appointed agencies.

.3 Employment of inspection/testing agencies does not relax the responsibility to perform Work in accordance with the Contract Documents.

.4 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Engineer at no cost to the Owner. Pay costs for retesting and re-inspection.

.5 Allow inspection/testing agencies access to the Work, off site manufacturing and fabrication plants.

.6 Cooperate to provide reasonable facilities for such access.

.7 Notify the appropriate agency and Engineer in advance of the requirement for tests, in order that attendance arrangements can be made.

.1 one (1) week advanced notice with two (2) business days (48hrs) confirmation prior.

.8 Submit samples and/or materials required for testing, as specifically requested in specifications or by the Engineer. Submit test results specifying that material requirements are being met. Submit with responsible promptness and in an orderly sequence so as not to cause delay in the Work.

.9 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.4 QUALITY CONTROL TESTING BY THE CONTRACTOR

.1 The Contractor shall retain the services of an independent testing agency under supervision of a registered professional engineer, and pay the cost of testing services for quality control including, but not limited to, the following:

.1 Concrete mix designs.

.2 Concrete testing.

.3 Commissioning and testing of diaphragm pump and piping in accordance with Section 01 81 00 - Commissioning.

.4 Any product testing that is required and is specified under various sections and specifications.

.5 Compaction testing shall be completed by the contractor at the contractor’s expense for quality control testing as prescribed in Section 31 23 01 Excavating, Trenching and Backfilling.

.2 Testing shall be in accordance with pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials (ASTM), Canadian Standards Association (CSA), and the Hydraulic Institute.

.3 The Contractor shall promptly process and distribute all required copies of test reports and test information and related instructions to all of his Sub-Contractors and Suppliers to ensure that all necessary retesting and replacement of construction can proceed without delay.

.4 The Contractor shall promptly provide the Engineer with copies of all test results.

1.5.1 REJECTED WORK

.1 Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Engineer as failing to conform to the Contract Documents. Replace or re-execute in accordance with the Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacement promptly.

.3 If in the opinion of the Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work performed and that called for by the Contract Documents, the amount of which shall be determined by the Engineer.

1.6 TESTS AND MIX DESIGNS

.1 Furnish tests results and mix design as required by contract documents.

.2 The costs of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the law of the Place of Work shall be appraised by the Engineer and may be authorized as recoverable.

1.7 MOCKUPS

.1 Prepare mock-ups for all piping, valves, fittings and pump to ensure proper and accurate fit and alignment of all components.

1.8 MILL TESTS

.1 Submit mill tests as required, or indicated on the drawings.

2.0 PRODUCTS

Not Used

3.0 EXECUTION

Not Used

TEMPORARY FACILITIES

1.6 Hoarding

.2 ***(Add clause 1.6.2 as follows)***

When not shown on *Contract Drawings* ensure adequate hoarding is in place to isolate *CONTRACTOR'S* lay down area and active *Work* area from public access.

1.9 Payment

.1 ***(Delete and replace as follows)***

Payment for temporary facilities as a separate pay item includes all the requirements under 1.1 of this Section. Progress payment for Temporary Facilities as a separate lump sum will be 40% upon fully providing the facilities required, 50% in equal monthly payments to cover the maintenance of the facilities provided and the remaining10% upon removal of the facilities upon completion of the project.

END OF SECTION 01 53 01

1.0 GENERAL

.4 ***(Delete and replace as follows)***
Give minimum 72-hour notice to Owner prior to beginning construction and comply in all respects with their requirements. The Contractor will be responsible for any and all local permits required to execute the work.

.6 ***(Add)***
The Contractor is required to provide 24-hour written notice to all residents, homes and businesses including all units in a multifamily site for any service or vehicle access interruption.

.7 ***(Add)***
The Contractor shall prepare, or cause to be prepared, a Traffic Management Plan (TMP). The TMP shall be submitted to the Owner for approval and the approved TMP shall be implemented and maintained during the Work. A separate TMP will be required for working on the Anchor Inn driveway.

.8 ***(Add)***
The following provisions must be included in the TMPs:

.1 Road closures on Highway 19A will not be permitted.
.2 Two-way traffic on Highway 19A must be maintained at all times.
.3 Dynamic Message Boards are to be placed at the following locations:
  a. Highway 19A – south of the Jubilee Parkway intersection
  b. At Robert Ostler Park north of the 4-way traffic controlled intersection
.4 Safe pedestrian movement must be maintained.
.5 Pedestrian and cyclist traffic should be accommodated by maintaining the sidewalks and using fencing and other protection measures to segregate this traffic and the construction activities. If the Contractor deems it necessary to close a section of sidewalk and eliminate non-motorized traffic through the work section, then a Pedestrian Management Plan must be submitted to the Owner in accordance with part 1.11 of this Section.

.9 ***(Add)***
The TMPs shall:

.1 Include an accurate road configuration, with road names, north arrow marker, speed limit and proposed extents of the Work.
.2 Indicate placement and distance of signs, delineators, cones, barricades, position of certified TCP's and traffic control equipment.
.3 Identify the number of lanes to be obstructed, along with taper lengths and widths of lanes.

.4 Identify impacts to driveways and bus stops, intersections, turning isles, sidewalks, and bike lanes. Include measures to facilitate and maintain access.

.5 Consider project specific restrictions (work hours etc.) as outlined in the Contract Documents.

.6 Include a map of full detour routes including the above requirements along each route.

.10 ***(Add)***

The Highway 19A TMP to be submitted as per Item 5.1.1.f of the Form of Tender. The Contractor will not be permitted to start any of the Work until the TMP has been approved by the Owner.

Other TMP's are to be submitted 15 Days prior to commencing Work at other locations.

.11 ***(Add)***

If required, the Contractor shall prepare, or cause to be prepared, a Pedestrian Management Plan (PMP). The PMP shall be submitted to the Owner for approval and the approved PMP shall be implemented and maintained during the Work.

1.4 Traffic Control

.4.8 ***(Delete and replace as follows)***

Maintain uninterrupted access / egress to / from all properties within or in the vicinity of the Work, unless authorized as part of the approved Traffic Management Plan or by the Contract Administrator.

.4.10 ***(Delete first paragraph and replace as follows)***

Provide Traffic Control Personnel (TCP), trained and certified by the BC Construction Safety Alliance (BCCSA), and properly equipped for the following situations:

1.5 Payment

.1 ***(Delete and replace as follows)***

Payment for all work performed under this Section will be on a lump sum basis. Payment shall be 30% upon preparing TMP(s) (and PMP(s)), securing permits and erecting traffic control devices; 60% distributed in monthly Progress Payments for traffic control persons and related control devices; and 10% upon Substantial Performance.

.2 ***(Add)***

Payment for supply, installation and maintenance of Dynamic Message Signs, also known as Changeable Message Boards, to be on a per sign per calendar week basis, pro-rated based on Work Days. Payment shall be for the number of signs requested by the Owner in accordance with the TMP and related permits.

END OF SECTION 01 55 00

ENVIRONMENTAL PROTECTION

1.6 Payment

.1 ***(Delete clause 1.6.1 and replace with)***
Payment for all *Work* performed under this Section will be a lump sum as per the Schedule of Quantities and Prices.

END OF SECTION 01 57 01

1.0 GENERAL

.1 Section 01 62 00 refers to the specific portions of the work related to the gravity sewer installation from station to station.

1.1 REMOVALS

.1 Removals shall include removal and disposal of existing concrete wall; removal of existing railing and interlocking concrete blocks, both to be used for the new interlocking concrete block wall and railing; removal of all appurtenances as required.

.2 All debris to be removed from the site and disposed of at a suitable site obtained by the contractor.

.3 The existing ‘Discovery Pier’ sign is to be removed and disassembled for the City of Campbell River to arrange pickup and storage.

.4 Contractor to comply with all relevant Environmental Protection requirements when performing the work.

.5 The lump sum price for this work shall be relative to the costs involved to undertake the works.

End of Section

1.0 GENERAL

.1 Compile product data and related information as specified in each section appropriate for the Owner's maintenance and operation of products furnished under the Contract using the standard template for O&M manuals.

.2 Prepare operating and maintenance data as specified in this Section, and as referenced in other pertinent Sections of the Specifications.

.3 Instruct Owner's personnel in the maintenance of products and in the operation of equipment and systems.

.4 Refer to General Conditions re: holdback until complete compliance with the performance of the Work of this Section.

.5 Submit two sets of operating and maintenance manuals for all equipment, valves, and fittings described herein or as requested by the contract. Include descriptive and technical data, all shop drawings, operating procedures, routine and preventative maintenance, wiring diagrams, spare parts lists, warranties, service companies, suppliers for replacement parts, test results, fire alarm certificate of verification, electrical inspection authority certificate and contract guarantee.

.1 Additionally Contractor to provide electronic copy in Word format. Capable of being edited for future work.

1.1 QUALITY ASSURANCE

.1 Preparation of data shall be done by personnel:

.1 Trained and experienced with knowledge in maintenance and operation of the described products.

.2 Completely familiar with requirements of the Section.

.3 Skilled as a technical writer to the extent required to communicate essential data.

.4 Skilled as a draftsman competent to prepare required drawings.

1.2 FORM OF SUBMITTALS

.1 Prepare data in the form of an instructional manual for use for Owner's personnel.

.2 In the format required by the standard template for O&M manuals.

.3 Submit two (2) complete copies for review. Once Owners comments have been incorporated, provide two (2) complete copies and an electronic copy. Provide the

electronic copy in MS Word format and sections, such as, manufacturer's information may be in PDF format. O&M shall include "As-Constructed" drawings of the completed works provided in AutoCAD and PDF format complete with plot style table (CTB file), a DWF file(s) containing all drawings and a reproducible copy to NAD83 UTM coordinates.

.4 Format:

.1 Each system shall be bound in a separate binder.

.2 Size: 215 mm x 280 mm

.3 Cover: Identifying each volume with types of printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".

.4 List:

.1 Title of Project

.2 Identity of general subject matter covered in the manual

.5 Binders:

.1 Two D-Ring binders with clear view pockets on front and side for each manual.

.2 Binders to fit 215 mm x 280 mm size paper.

.3 When multiple binders are used, correlate the data into related consistent groupings.

1.3 CONTENT OF MANUAL

.1 Neatly typewritten table of contents for each volume, arranged in systematic order where applicable following specification format.

.1 Contractor, name of responsible principal, address and telephone number.

.2 Names of subcontractors and suppliers.

.3 A list of each product required to be included, indexed to the content and the volume. Relate Index and Contents to sequence of the 16-Division Master Format.

.2 Include only those product data sheets pertinent to the specific product. On each sheet clearly identify the data applicable to the installation, or delete inapplicable references.

.3 Include the following information plus data specified:

.1 List all equipment which will require regular inspections and servicing.

.2 Maintenance instructions for all equipment and materials.

.4 Drawings: do not use Project Record Drawings as Maintenance Drawings.

.5 Adjusting tools, keys, spare parts: necessary adjusting tools, wrenches, brushes, keys, spares and the like as stipulated shall be provided at no additional cost to the Owner.

.6 Equipment and Systems:

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts;

.2 Panelboard Circuit Directories: provide electrical service characteristics, controls and communications;

.3 Include installed colour coded wiring diagrams;

.4 Operating Procedures: include start-up, break in and routing normal operating instructions and sequences. Include registration, control, stopping, shut-down and emergency instructions. Include any special operating instruction;

.5 Maintenance Requirements: include routine procedures and guide for troubleshooting, disassembly, repair and reassemble instructions; and alignment, adjusting, balancing and checking instructions;

.6 Provide servicing and lubrication schedule, and list of lubricants required;

.7 Include manufacturers printed operation and maintenance instructions;

.8 Include sequence of operation by controls manufacturer;

.9 Provide original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance;

.10 Provide installed control diagrams by controls manufacturer;

.11 Provide Contractor's coordination drawings, with installed colour code piping diagrams;

.12 Provide list of original manufacturer's spare parts, current price and recommended quantities to be maintained in storage;

.13 Include test reports as specified in Section 01 40 00 – Quality Control or other sections;

.14 Additional Requirements: as specified in individual specification sections.

.7 Warranties and Bonds

.1 Compile specified warranties and bonds;

.2 Co-execute warranty submittals when so specified;

.3 Review submittals to verify compliance with Contract Documents;

.4 Submit to Engineer for review and onward transmittal to the Owner;

.5 Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors;

.6 Number of original copies required: one (1) each.

2.0 PRODUCTS

Not Used

3.0 EXECUTION

Not Used

CONCRETE WALKS, CURBS AND GUTTERS

1.4 Measurement and Payment

.6 ***(Delete clause 1.4.6 and replace with)***
Payment for driveway crossings including granular base as shown on
Standard Detail Drawing C7 will be made on a directed by the *Contract Administrator* for each specified thickness.

.10 ***(Add item 1.4.10 as follows)***
Payment for concrete driveway panels includes granular base as shown on Standard Detail Drawing C1 and will be made on a square metre basis as per the *Contract Drawings* for each specified thickness.

.11 ***(Add item 1.4.11 as follows)***
Payment for removal and replacement of brick pavers includes granular base and will be made on a square metre basis as per the Contract Drawings.

END OF SECTION 03 30 20

1.0 GENERAL

.1 Section 03 30 55 refers to those portions of the work that are unique to the construction of interlocking concrete block walls. This section must be referenced and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

.1 Not Used.

1.2 References

.1 As described herein this section.

1.3 Measurement and Payment

.1 Payment for interlocking concrete block walls will be measured by wall face area from existing ground or proposed profile at centerline of trail and includes sub-grade preparation, bedding material, leveling pad, anti-graffiti paint, supply and installation of existing and new blocks and reinforcement, infill grouting, transportation, loading, placing, hauling, infill material, geogrid reinforcement, and installation of all materials required. Payment for interlocking concrete block walls in cut locations to include ½ block (375mm) to be set below finished grade. Interlocking concrete block walls as per details on Contract Drawings.

.2 Any Item not specifically identified but required for the construction of the retaining wall including the railing, shall be considered incidental to the work and shall be considered to be included in the applicable Items listed in the *Schedule of Prices and Estimated Quantities*.

1.0 PRODUCTS

.1 New Interlocking concrete blocks shall be Lock-Block® or alternative type blocks acceptable to the Engineer. Blocks shall be 750 mm x 750 mm x (1500 mm or 750 mm) long chamfered on all sides, provided with shear keys, with a 12 mm clearance around the key, and steel lifting devices. All exposed surfaces shall have a smooth finish conforming to CSA CAN3-A23.4-00 Section 24.2.5 Grade A.

.1 Only new interlocking blocks will be accepted.

.2 Concrete shall comply with BC MoT SP 2.17 and as specified below:

Minimum 28 day compressive strength (MPa)	30
Nominal size of aggregate (mm)	28
Air content (%)	5% - 7%
Maximum slump (mm)	50 ± 20
Maximum water/cement ratio by weight	0.45
Minimum cement content (kg/m3)	320

.3 Consistency of finish shall be maintained with the use of the same concrete mix (individual blocks shall not contain cold joints) and the same type of form oil for the entire project. Non-exposed surfaces shall be of uniform surface finish, roughly screened with no open pockets or distortions in excess of 12 mm.

.4 Polymeric Reinforcement: Properties of polymeric reinforcement strips for walls under 5 m in height shall be as shown on the Drawings

.5 Anti-Graffiti Paint

.1 Provide Anti-Graffiti certification prior to use.

.2 Anti-Graffiti effectiveness in accordance with ASTM D7089 - 06

.3 Use and installation in accordance with manufacturer's recommendations.

2.0 EXECUTION

.1 Excavation and backfill shall be carried out to the neat lines and dimensions shown on the Drawings. Select granular sub-base material shall be used for backfill of the retaining walls. Free draining granular material if available, may be substituted for select granular sub-base material if acceptable to the Ministry Representative.

.2 Leveling Pad: 300 mm of granular base course material compacted to 100% Standard Proctor Density shall be used for a leveling pad for the first layer of blocks.

.3 Perforated sub-drain pipe shall be installed to the neat lines and dimensions shown on the Drawings. The pipe shall be installed along the entire length of wall and low points shall have a discharge pipe tee to the face of the wall.

.4 Concrete block elements shall be placed on a graded and compacted base to within the tolerances stated below:

i. Vertical and horizontal alignment □20 mm in 3000 mm

ii. Overall vertical tolerance □20 mm (measured from top to bottom)

iii. Component placement shall not vary more than 25 mm in plan or more than 12 mm from grade.

.5 The first layer of blocks shall be placed so that half of the block face is buried in the original ground. The second layer of blocks shall normally be placed after 10 bottom layer blocks have been placed, aligned and the keyways cleared of debris.

.6 Compacted 25 mm granular material shall be used for the toe fill as shown on the Drawings. The toe fill shall be placed after the first level of blocks has been placed.

.7 The length of Polymeric Reinforcement strips will vary depending on the height of the concrete blocks. The polymeric reinforcement strips shall be sandwiched between the successive rows of lock blocks and shall extend for the full length shown on the Drawings. It is important that the strips are placed against each other with no gaps between them. No vehicles shall drive directly over the polymeric reinforcement.

.8 The retaining walls shall be constructed with precast monolithic concrete blocks in accordance with the dimensions, lines, and grades shown on the Drawings.

.9 The Engineer reserves the right to reject concrete blocks based on visual and non-destructive methods.

.10 The top course of blocks shall be bench style lock block with recessed lifting devices or inserts.

.11 The top course of blocks shall be supplied flat topped without shear keys, and with recessed lifting devices or inserts.

.12 Where clearance between adjacent blocks (as measured from face of block to face of block) exceeds 20mm, Contractor to supply and install infill grout in the opening to a minimum depth of ½ the depth of the block. Grout to be flush with inside edge of chamfer. Use non-shrink grout, match color with blocks.

.13 After block wall has been constructed, apply 1 coat of anti-graffiti paint to the exposed face surface area of the retaining wall, adhering to all of the suppliers recommendations.

3.1 Quality Control of the Concrete Blocks

.1 Contractor to comply with the quality control requirements of British Columbia Ministry of Transportation and Infrastructure (BC MoT) 2012 Standard Specifications for Highway Construction, Section 211.

.2 In addition to the quality control requirements of BC MoT SS 211, the Contractor shall extract two cores from one lock block for every 50 blocks prior to delivery to the Site. The cores shall be the standard cylinder sizes of 100 mm diameter and 200 mm high. One of these cores will be tested for the compressive strength in accordance with CSA-A23.2-14C and CSA-A23.2-9C. The second core shall be tested for air void analysis in accordance with ASTM C457. If the compressive strength or air void analysis does not meet the required specifications, the entire 50 blocks will be rejected at the Contractor's cost. The Contractor shall be responsible for insuring that the test results are traceable to each of the 50 block lot tested. The cores shall be taken in the middle of the block along the back face so that the block may still be used if specifications are met. The cored holes shall be patched and sealed using a patching mortar in accordance with BC MoT SS 211.17.05.

.3 Blocks without traceable testing documentation will not be accepted for use on the project

.4 All test reports and inspections are to be submitted to the Engineer.

3.2 Anti-Graffiti Cleaning

.1 Contractor shall clean / remove any graffiti on the anti-graffiti surface prior to application for substantial completion. Failure to clean / remove graffiti will be cause for not achieving substantial completion.

End of Section

1.4 Measurement and Payment *(Add Clause 1.4.5 as follows)*

Provide and maintain minimum 75mm thick compacted and graded 19mm crushed gravel temporary running surface for the duration of the project and until asphalt paving has taken place. Payment will be mad on a per unit basis as per the Schedule of Quantities and Prices.

End of Section

EXCAVATING, TRENCHING AND BACKFILLING

1.10 Measurement and Payment

.9 ***(Add clause 1.10.9 as follows)***
Pre-locating all existing sanitary service locations will be required prior to installing new service saddles or tees and payment will be made on a per unit basis as per the Schedule of Quantities and Prices.

END OF SECTION 31 23 01

CONTROLLED DENSITY FILL

1.4 Measurement and Payment

.1 ***(Delete clause 1.4.1 and replace as follows)***
Payment for the controlled density fill will be by cubic metre in place based on the area of the inside of the pipes multiplied by the length of the pipe to be infilled. The price bid for "Infill of Abandoned pipe with Controlled Density Fill" will be for the supply and placement of the concrete slurry and all work associated with closing water valves, cutting pipe, placing bulkheads and all other associated work.

3.1 General

.1 ***(Delete clause 3.1.1 and replace with the following)***
The controlled density fill that is described in this clause will be for infilling the existing abandoned pipes as noted on the drawings. The controlled density fill will be comprised of concrete/gravel slurry and is to be designed to achieve 1 MPa. The slurry is to completely fill all voids in the abandoned pipes. The *CONTRACTOR* is advised that the pipe may have to be cut in certain areas to ensure that the voids are completely filled. The *CONTRACTOR* is to supply a design mix for the slurry at least one week prior to it being used.

END OF SECTION 31 23 23

GRANULAR BASE

1.4 Measurement and Payment

.5 ***(Add clause 1.4.5 as follows)***
Payment for gravel driveway restoration will be for 100mm compacted and graded 19mm minus crushed gravel per square metre as per the Schedule of Quantities and Prices.

END OF SECTION 32 11 23

HOT-MIX ASPHALT CONCRETE PAVING

1.5 Measurement and Payment

.7 ***(Add to this clause)***
Saw cutting along the permanent reinstatement lines as per the trench and pavement reinstatement detail (sheet 2) for pipe laying work is not permitted.

.9 ***(Add clause 1.5.9 as follows)***
Supply and installation of all Hot-Mix Asphalt Concrete Paving will be by *Other Contractor* for which the *CONTRACTOR* will be responsible for coordinating of all necessary *Work* effort to ensure the Hot-Mix Asphalt Concrete Paving is installed in the most efficient manner possible. Payment for this coordination effort will be lump sum as per the Schedule of Quantities and Prices.

END OF SECTION 32 12 16

PLANTING OF TREES, SHRUBS AND GROUND COVER

1.9 Measurement and Payment

.3 ***(Add to this clause)***

Payment for landscape restoration will include all labour, equipment and materials required to reinstate the existing landscape features to match the pre-construction condition. Payment will be per property.

END OF SECTION 32 93 01

1.0 GENERAL

1.1 SCOPE

A. This section includes the work necessary to furnish and install, complete, two (2) radial activated carbon odour control systems. This systems shall be rated for outdoor service, located as indicated in the contract documents.

B. The system shall include the following components:
   1. Carbon Adsorber Vessel
   2. Activated Carbon Media
   3. Fan and Motor Assembly
   4. Instruments
   5. Controls
   6. Pre-filter

1.2 RELATED DOCUMENTS

A. All codes, as referenced or as applicable in the Province of British Columbia.

1.3 REFERENCES

A. ASTM International
   1. D2563, Standard Practice for Classifying Visual Defects in Glass Reinforced Plastic Laminate Parts.
   2. D2584, Standard Test Method for Ignition Loss of Cured Reinforced Resins.
   3. D2854, Standard Test Method for Apparent Density of Activated Carbon.
   4. D 2867, Standard Test Methods for Moisture in Activated Carbon.
   5. D3299, Standard Specifications for Filament-Wound Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks.
   6. D3467, Standard Test Method for Carbon Tetrachloride Activity of Activated Carbon.
   7. D3802, Standard Test Method for Ball-Pan Hardness for Activated Carbon.
   8. D4097, Standard Specification for contact-molded glass-fiber-reinforced Thermoset Resin Corrosion-Resistant Tanks.

1.4 SUBMITTALS

A. Submittals shall include:

1. General Specification Compliance Document
    a. A copy of this specification with a notation beside each line item confirming compliance or any deviations / exceptions. Any deviations or exceptions should be clearly explained in a separate section of the submittal.
    b. Designer's resume showing 10 years of experience.
2. Vessel, Isolation valve and Interconnecting Ductwork:
    a. Provide structural calculations, including material property test data.
    b. Vessel fabrication details and materials of the components shall be included in shop drawings, and submitted for approval before fabrication.
    c. Vessel design calculations stamped by a professional engineer licensed in the Province of British Columbia.
    d. Resin manufacturer's certificate listing the nomenclature, composition, and characteristics of the resin shall be furnished for all major components including the vessel, dampers and ductwork. This should include a letter from the resin manufacturer stating recommended corrosion liner for service outlined in this specification.
    e. Documentation proving the damper supplier is a current member of AMCA International and that the proposed vessel inlet damper has been tested for pressure drop and leakage within the previous 36 months.
    f. Vessel fabricator's certificate of compliance with fabrication requirements.
    g. Copy of fabricator's quality assurance (QA) program.
    h. Detailed information on the internal media retention system to include free area calculations, construction data, baffling system and compaction compensation calcs.
    i. 12" x 12" sample of the proposed carbon retention system
3. Prefilter
    a. Detailed drawing showing wall construction, pad construction details, end connections and access configuration.
    b. Installation instructions and O&M Data
    c. Detailed removal and performance calculations
    d. List of five previous installations where a similar prefilter has been utilized by the system supplier complete with names and contact numbers.
    e. Detailed pressure drop calculations for the prefilter.
4. Carbon Media:
    a. Furnish with 60 days after contract execution, a certificate from the media manufacturer certifying that the proposed media will meet the specifications. Provide a 1-gallon representative carbon sample of each media and specification sheet.
    b. Statement of origin and manufacturers test data noting lot numbers. Submitted lot numbers shall be confirmed with actual material delivered. Media shall not be private-labeled by the system supplier.
    c. Media manufacturer's certificate to include statement of origin and test results.

5. Catalog information, descriptions, specifications layouts, sketches and other information sufficient to clearly and readily demonstrate compliance with all parts of the specifications and drawings.
6. Dimensional and weight information. Include empty weight and operating weight with carbon.
7. A list of twenty-five (25) installations where similar equipment by the manufacturer is currently in service; include contact name, telephone number, mailing address, and the names of the engineer, owner, and installation contractor. References shall include better than 50% of systems over 5 years old.
8. A list of ten units of equal or larger size that have been in operation under the system manufacturers name for over ten years – complete with contact numbers.
9. Resin manufacturer's certificate listing the nomenclature, composition, and characteristics of the resin shall be furnished for all major components including the vessel, dampers and ductwork. This should include a letter from the resin manufacturer stating recommended corrosion liner for service outlined in this specification.
10. Special shipping, storage, and protection, and handling instruct ruction.
11. Suggested spare parts list to maintain the equipment in service for a period of 1 year.

1.5 QUALITY ASSURANCE

A. The system supplier shall have experience in carbon adsorption systems in wastewater odour control applications, demonstrating at least 10 years' experience. Experience shall be based on the company and not any individual.

B. Fabricator's QA Supervisor: Minimum of 10 years' experience in fabrication of fiberglass structures, and carbon based odour control systems.

C. Designer: Registered professional engineer with a minimum of 10 years of experience in the design of odour control systems.

PART 2 – PRODUCTS

2.01 GENERAL

A. The system supplier shall furnish all of the items required to provide a properly functioning system for the service conditions listed herein, including but not limited to the vessel, media, fan, controls, prefilter, exhaust stack, inlet isolation damper and all appurtenances necessary for a complete system.
   1. Interconnecting ductwork from the odour source to the fan and from the fan to the carbon vessel shall not be included in this proposal and will be provided by others.

B. Acceptable suppliers of the full packaged system include ECS Environmental Solutions, Evoqua Water Technologies, or approved equal.

2.02 SERVICE CONDITIONS

A. The odour control system shall be provided by one manufacturer to treat foul air from a pump station wet well. The air is expected to contain a mixture of hydrogen sulfide and volatile organic compounds. The activated carbon adsorber system shall be designed for the following operating conditions and criteria:

Process Parameter	Value
Number of Systems	2
System Capacities	System 1: 2,150 m3/h (1200 cfm) System 2: 1,020 m3/h (600 cfm)
Duty Location	Outdoors, Victoria, BC
Inlet Gas Temperature	4 – 50° C (40 - 120°F)
Inlet Gas Relative Humidity	40 to 90%
Maximum Inlet H_2S Concentration (ppm)	System 1: 50 ppm System 2: 15 ppm
Hydrogen Sulfide Treatment Efficiency	99% removal
Volatile Organic Compound (VOC) concentration	1 ppm
VOC minimum required removal efficiency	50%
Maximum VOC outlet concentration	0.5 ppm
Minimum Carbon Volume	System 1: 2 m^3 (70 ft^3) System 2: 1 m3 (36 ft^3)
Pre-Filter (Grease/Mist Eliminator):	
1. Clean Headloss	25.4 mm (1 in.) water column
2. Headloss at scheduled cleaning	50.8 mm (2 in.) water column
3. Maximum Cleaning Frequency	30 days
4. Time Required to Clean (Demonstrated)	1-hour Max
Upstream Ductwork System Headloss	1.2 in. water column
1. Does not include Pre-Filter Losses	
Maximum Average Carbon Face Velocity (fpm)	60
Ambient (Exterior) Temperature Range	-40 - 40°C

B. The vessels shall conform to the following parameters:

Process Parameter	Value
Vessel Type	Radial
Vessel Material of Construction	FRP

Pressure Drop (Max)	Vessel (Inlet to Outlet): 6” w.c.
Max Bed Velocity	60 fpm
Vessel top body flange thickness	6” minimum
Fan Pressure Ratings	Determined by supplier

2.03 ADSORBER VESSEL

A. The FRP adsorber vessel shall be filament-wound, manufactured in accordance with ASTM D3299. The visual defects, per ASTM D2563, shall not exceed Level II on the vessel interior and Level III on the vessel exterior. The resin used shall be Dow 510, AOC K022, or approved equal suitable for continuous exposure to saturated water vapor, hydrogen sulfide gas, and their associated acidic products. The resin system should provide a class 1 flame spread rating. Antimony, Nyacol or any other additives are not allowed. A permanent wax containing resin coating, formulated according to the resin manufacturer's most recent recommendations (or other Engineer-approved method) shall be used for surface protection and to prevent air inhibition of resin curing. Contact molded accessories shall be manufactured in accordance with NBS PS15. The completed vessel shall be translucent until it is gel coated. The final gel coat color shall be selected by the owner or engineer. A certificate from the resin manufacturer listing the nomenclature, composition, and characteristics of the resin shall be furnished with the vessel. Stainless, PVC, HDPE, PP or other non-reinforced plastic vessels will not be acceptable.

1. An inner corrosion barrier shall be provided consisting of no less than three laminated layers. The inner corrosion layer shall be resin rich, not to exceed 20 percent plus or minus 5 percent glass by weight, and a minimum thickness of 10 to 15 mils. The inner corrosion layer shall be followed by at least two layers of chopped-strand mat or two passes of chopped roving to a total of 3 ounces per foot. Should the chopped roving technique be employed, the chopped fibers shall be 1/2 inch to 2 inches in length. The total corrosion barrier shall total 100 mils minimum and be 27 percent plus or minus 5 percent glass by weight.
2. The structural aspects of the vessel shall be sufficient to meet recommended requirements, including seismic requirements for all conditions during the design life. Manufacturer shall include with the shop drawings, detailed calculations illustrating the seismic characteristics of the proposed vessels. Calculations shall be signed and stamped by a registered mechanical engineer licensed in the Province of British Columbia.
3. In addition to the above requirements, the adsorber vessel shall have an average glass content of 55 percent plus or minus 5 percent by weight per ASTM D2584.
4. Tie down lugs and lifting lugs shall be 316 stainless steel. Quantity and design shall be determined in the PE stamped vessel calculations.

5. The adsorber vessel shall be complete with integral carbon screen support structure, access manways, air inlet connection, air outlet, discharge stack with rain hood, pressure differential assembly, a fill connection, a drain connection, sample port nozzles, 316 stainless grounding rod and all necessary accessories as shown on the Drawings and/or specified within. All exhaust air shall leave the vessel at the top. Provide sufficient access manway so that all internal parts can be easily removed from the vessel. All metal parts shall be Type 316 stainless steel with no metallic parts contacting the carbon except for grounding purposes. No pultruded components shall be used on the interior of the vessel unless they are completely coated with the specified 100-mil corrosion barrier and manufactured using the specified resin systems.
6. Access manway covers shall be airtight at the pressure equal to or higher than the corresponding fan static pressure. Poly manways are not acceptable. The fabrication details and materials of the components shall be included in shop drawings, and submitted for approval before fabrication.
7. Vessels shall have a flanged top section to facilitate complete removal of all internal components. Flange shall be design for 12 inch positive pressure and full hydrostatic loading.
8. Vessel design and airflow configuration shall be furnished to accommodate a media column. Airflow shall be horizontal through the bed.
    a. Support system requirements:
        i. The bed and vessel configuration is to be conducive to easy carbon replacement. Bed shall have carbon fill / access ports and one access manway placed so man-entry of the vessel is not required.
        ii. Each vessel shall be provided with two independent columns.
        iii. Columns shall be manufactured from FRP, Stainless Steel or hastelloy. Unreinforced plastic columns (PVC, PP, HDPE) are not acceptable. Retention screen shall be inter-wound in the support column so that it cannot be disturbed during filling / removal of media. If metal is utilized retention screen shall have an independent structure on either side.
9. Bed shall be grounded with a 316 stainless steel rod to prevent static electricity from accumulating. A predrilled and tapped copper grounding pad shall be located on external vessel walls.
10. Each vessel shall have an internal sloped bottom of no less than 1/8 inch per foot. Slope shall direct liquid to a drain connection on the vessel exterior.
11. All cut-walls from tank wall nozzle cutouts shall be reinforced as required by service conditions. Press molded or compression molded flanged nozzles are not acceptable.
12. Add ultraviolet absorbers to surfacing to improve weather resistance.
13. No dyes, pigments or colorants except in exterior gel coating.

2.04 MEDIA

A. Vessel shall be supplied with a primary bed of high capacity activated carbon per the following.
    1. H2S breakthrough of 0.30 g/cc minimum

2. Hardness number of 95% minimum
3. 4x8 peletized structure. Granular carbon is not acceptable
4. Coconut or coal base. Wood or lignite based carbons are not acceptable

B. Acceptable Manufacturers
1. Calgon
2. Jacobi
3. Evoqua

No alternative private-labeled carbons are acceptable.

[1] The determination of H2S breakthrough capacity will be made by passing a moist (85% R.H.) air stream containing 1% H2S at a rate of 1,450 cc/min. through a 1 inch diameter by 9 inch deep bed of uniformly packed activated carbon and monitored to 50 ppm breakthrough. Results are expressed in grams H2S removed per cc of carbon. Test shall be performed per ASTM Test method D-6646, without modification or addition

2.05 INLET ISOLATION DAMPER

A. The system supplier shall be responsible for supplying a vessel inlet isolation damper.
1. Vessel inlet valve shall have an AMCA Certified ultra-low leak isolation damper installed. Acceptable products are the ECS X02.

2.06 ADSORBER VESSEL ACCESSORIES

A. 16 gauge SST name plate with ¼" die-stamped equipment tag number securely mounted in a readily visible location.

B. 316 SST or FRP lifting and anchor lugs

C. Vessel shall be supplied with a Dwyer differential pressure gauge assembly complete with isolation valves.

2.07 FAN

A. Provide a fan in accordance with Section 33 30 20 – Odour Control FRP Fan

2.08 INSTRUMENTATION

A. Pressure differential instruments shall be provided and include Magnehelic style pressure gauges allowing determination of the pressure loss in inches of water column across the carbon. The range shall be 0-10 inches of water. Tubing shall be bonded to a solid acrylic plastic block that contains safety traps. Magnehelic shall be Dwyer or equal.

B. Sampling Ports: Each adsorption unit shall have three 2-inch diameter sample ports which extend into the carbon bed 1 foot minimum, suitable for extracting carbon samples. Provide one grain thief that is capable of extracting a core sample of the in-place carbon through the sample ports. Ports shall be adequate to provide suitable extraction of air samples from the carbon bed and be nonbinding. Each port nozzle shall extend outside the vessel wall and be blocked off with a 2-inch ball valve. One additional air sampling port shall be provided above the carbon bed.

2.10 PRE-FILTER

A. Provide a grease/mist eliminator suitable for outdoor installation upstream of the odour control system specified to reduce inlet air moisture content and remove particulates and aerosol grease in order to optimize the performance of the odour control system. The unit shall consist of a 304L stainless steel pad for grease filtration in front of a PPL pad with 316 stainless steel grid for particle filtration housed inside a corrosion resistant material suitable for exposure to the specified odour and atmospheric conditions. The pads shall be removable for cleaning and the housing shall have a door, or dropout flange, to allow removal and replacement of the filter pads. The housing shall be flanged and drilled per PS 15-69 and come complete with gaskets, ready for installation. The unit shall be rated for the airflow capacities listed below:

B. The headloss across a clean filter shall not exceed 25mm (1-inch). Similarly, headloss across a dirty filter shall not exceed 50mm (2-inches). The grease/mist eliminator shall be suitable for continuous operation. The unit shall be provided with the following elements:

   a. The filter pads will be removable from the exterior of the unit for inspection, cleaning and replacement without complete disassembly of the grease filter/mist eliminator.
   b. Differential pressure gauge or manometer for headloss measurement across the unit. Provide unit readable in cm of water column.
   c. At least one access opening to the filter elements.
   d. NPT or flanged drain connection with isolation ball valve. Materials shall be corrosion resistant.

PART 3 – EXECUTION

3.01 FACTORY TESTING

A. All equipment shall be factory tested for compliance with the requirements specified herein. In addition, a full hydrostatic atmospheric leak test (zero leakage allowed).

3.02 PERFORMANCE TESTING

A. Air flows shall be balanced prior to performance testing.

B. The time of the tests and detailed test procedure shall be submitted for approval prior to the testing period.

   a. During testing, flow rates shall be held constant. Changes in system operating conditions shall not be permitted. All fine-tuning of operating conditions shall be performed prior to testing.
   b. Design operating conditions shall be maintained for a minimum of 4 hours. During this time, all pertinent operating parameters shall be monitored and recorded, sufficient sampling and analysis shall be conducted to demonstrate that flow rates are at design conditions
   c. Hydrogen sulfide concentration shall be measured at the system inlet and outlet. Inlet and outlet levels shall be measured once every 30 minutes using a portable H2S analyzer such as Interscan, Jerome, Odalog or equal.

C. A description of the performance tests shall be submitted for the Engineers approval. Approval must be granted prior to testing.

3.03 MANUFACTURER'S SERVICES

A. Manufacturer's Representative: Present at Site and/or classroom designated by Owner for minimum person-days listed below.

   1. One person-days for installation assistance, inspection, functional testing, and completion of Manufacturer's Certificate of Proper Installation.

END OF SECTION

1.0 GENERAL

1.1 REQUIREMENTS INCLUDED

The Contractor shall furnish and install complete, tested and operating, two (2) fiberglass fans, motor, guard, and accessories as shown on the Drawings and as specified herein for complete and operable system, all in accordance with the Contract Documents. The Fiberglass Fans will be provided for evacuation of foul air service and all components of the system exposed to the airstream shall be resistant to continuous exposure to a moist airstream with an average H_2S concentration of 50 ppm.

1.3 REFERENCE SECTIONS

1 Section 13500 – Carbon Odour Control Systems

1.4 QUALITY ASSURANCE

A. All materials and equipment furnished under this Section shall:

1. Be of a manufacture who has been regularly engaged in the design and manufacture of fiberglass fans for a minimum of 5 years.
2. Be demonstrated to satisfaction to the Engineer that the quality is equal to the material and equipment made by those manufacturers specifically named herein, if an alternate product manufacturer is proposed.

B. Shop Performance: Each fan shall be run at the factory to assure proper operation of all rotating parts, including wheel, shaft, bearings, sheaves, and belts. Motors shall be tested for amperage draw by dampering the fan from free-flow to no-flow operating, to assure the motor selected will not overload at any condition

C. Performance Testing: Certified factory performance tests in accordance with Air Moving and Conditioning Association (AMCA) Standards shall be conducted for all fans. Test results shall be submitted to the Engineer for review. The Contractor shall not ship the fans to the job site before receipt of the Engineer's favorable review.

1.05 Shop Drawings

A. Submit shop drawings of equipment as specified herein. Drawings shall include:

1. Performance Curves and Data - The MANUFACTURER shall be required to indicate points on the H/Q curves, and the limits recommended for stable operation between which the fans may be operated without surge, vibration or harm to the equipment. The stable operating range shall be as wide as possible based on actual tests, performed at the factory in accordance with the ANSI/ASME PTC 9 and 10 test codes.
2. Dimensional drawings
3. Support/anchoring details

4. Assembly and installation drawings including shaft size, seal, coupling, anchor bolt plan, parts nomenclature, material list, outline dimensions and shipping weights.
5. List of recommended spare parts
6. Motor Data, to include: horsepower, NEMA Design, enclosure type, frame size, service factor, winding insulation class and bearing data.
7. Electrical data, to include voltage, phase and frequency ratings and full load current at rated horsepower.
8. Verification that the fan will meet the requirements of ASTM D4167-97.

B. Certification: The MANUFACTURER shall provide written certification addressed to the OWNER, stating that the equipment will efficiently and thoroughly perform the required functions in accordance with these Specifications, and that the MANUFACTURER accepts full responsibility for coordination of all equipment, including motors, controls, and services required for proper installation and operation of the completely assembled and installed unit. The MANUFACTURER shall submit all such certificates to the ENGINEER.

C. O & M Manuals: The MANUFACTURER shall furnish to the OWNER complete operations and maintenance manuals.

D. Tools: Special tools necessary for maintenance and repair of the equipment and one pressure grease gun for each type of grease required for fan and/or motor shall be furnished as a part of the Work hereunder. Such tools shall be suitably stored in metal toolboxes, and identified with the equipment number by means of stainless steel or solid plastic nametags attached to the box.

E. Spare Parts: The MANUFACTURER shall provide a list of suggested spare parts of all items of each fan, motor, and drive, subject to wear, such as seals, packing, gaskets, nuts, bolts, washers, wear rings, etc.

F. Maintenance: Printed instructions relating to proper maintenance, including lubrication, and parts lists indicating the various parts by name, number, and diagram where necessary, shall be furnished in duplicate with each unit or set of identical units in each station.

G. Field Procedures: Instructions for field procedures for erection, adjustments, inspection, and testing shall be provided for each piece of equipment.

1.6 MANUFACTURER'S SERVICE REPRESENTATIVE

A. Erection and Startup Assistance: Service and instruction assistance by the manufacture's service representative shall be provided during the following periods:

1. One (1) day (minimum) during erection.
2. One (1) day (minimum) during startup.

B. Instruction of Owner's Personnel: The Manufacturer shall provide the services of a factory trained service representative for one day to instruct the Owner's personnel in the operation and maintenance of the equipment.

1.7 WARRANTIES

A. After completion, the MANUFACTURER shall furnish to the Owner the manufacturer's written guarantees, that the equipment will operate with the published efficiencies, heads, and flow ranges and meet these specifications. The MANUFACTURER shall also furnish the manufacturer's warranties as published in its literature and as specified.

2.0 PRODUCTS

2.1 MATERIAL

A. Fans

1. Acceptable Manufacturers:

a. Universal Fan and Blower

b. Hartzell Propeller Fan Co.

c. Ceilcote Co. Inc.

d. Harrington Industrial Plastics

e. New York Blower

f. Approved Equal

B. General:

1. The odour control fans shall meet the following general operation conditions:

Number Fans Required: Two

Fan Type: Centrifugal

Service: Foul Air, Average H_2S Concentration 50 ppm

Operating Pressure 7.0 in w.c..

Airflow Capacity System 1: 2,150 m^3/h (1200 cfm)
System 2: 1,020 m^3/h (600 cfm)

Drive Type: V-Belt

Motor: Class 1, Division 1, Squirrel cage induction type, TEFC, explosion-proof, Class B temperature rise, Class F insulation, 1.15 service factor

Motor Horsepower: As required to meet airflow and static pressure requirements for each system

Max. Motor Speed: 1,800 rpm

Motor Accessories: Motor space heater to prevent condensation, winding thermal protection, thermostat type.

1. Housings and side panels shall conform to the standard thicknesses as stated by the National Association of Fan Manufacturers. Units shall be manufactured by a member of AMCA (Air Movement and Control Association) and tested in an AMCA certified laboratory and in accordance with AMCA test procedures.

2. Fan performance shall be certified by the MANUFACTURER to AMCA Standards Handbook 99, Test Code for Air Moving Devices 210 and Certified Ratings Program for Air Moving Devices 211.

3. Fan shall be sized so an increase in speed of 10% will not exceed the maximum RPM of the class of fan.

4. Fan housing and impeller shall be constructed of an FRP laminate consisting of fire retardant resin and fiberglass or synthetic reinforcement capable of resisting continuous fume temperatures of 200^{o}F. Provide fire retardant qualities in accordance with ASTM E-84 Tunnel Test Rating of less than 30. All laminates shall be manufactured in accordance with PS 15-69, ASTM C582.

5. The outer surface of the wheel and the complete inner surface of the housing shall be electrostatically conductive with a maximum of 1 Mohm resistance between the airstream surface and ground in accordance with ASTM D4167-97. The OWNER shall be responsible for electrostatically grounding the fan.

6. Provide all interior surfaces exposed to the corrosive air stream fabricated of resin containing not more than 20% of the appropriate surface veil. All surfaces exposed to the atmosphere shall be fabricated of a paraffinated resin stabilized against ultraviolet degradation. Immediately beneath the surfacing veil of the interior and exterior surfaces of the laminate, provide a layer of either chopped strand mat or woven roving. The chopped strand mat shall be Type E glass of 1.5 ounces per square foot in weight. The

woven roving to be Type E glass of a nominal 24 ounces per square yard in weight and 4 x 5 weave.

7. No metal parts shall be exposed to the corrosive air stream.

8. Fans shall be sized to operate below their first critical speed throughout the specified operating range.

9. Fans shall be sized such that the impeller tip speed does not exceed 8.6 meters per second.

10. Fans shall be equipped with heavy-duty bearings, rated for a B-10 life of 100,000 hours, grease packed and sealed against dust and moisture.

11. Fans shall be equipped with belt drives provided with heavy duty matched “deep V” type V-belts sized to handle 1.5 times the rated brake horsepower of the fan motor and incorporating heavy duty industrial type companion sheaves.

12. Fan shall be statically and dynamically balanced. A certification of the balancing tests is required at time of delivery.

13. The fan housing and impeller shall include graphite impregnation, and a grounding lug must be included to facilitate the discharging of static electricity to an external ground.

14. Fans equipped with belt drives shall be provided with a belt guard to protect the belt drive, motor, and personnel. This cover may be fabricated of FRP or stainless steel.

15. Furnish fans of type and arrangement as indicated complete with motor, guards, drive equipment, controls, vibration isolators, supports and appurtenances.

16. Overall noise level from the assembled and installed fan and motor with the ductwork installed in place shall not exceed 93 dB(A) at 1 meter from the equipment. An acoustical enclosure as specified herein shall also be required for noise attenuation.

C. Fan Accessories:

1. Pressure Gauges: Provide manometer type pressure gauges on the inlet and discharge sides of the fan calibrated in inches of water and capable of operation at the expected system pressures and vacuums and suitable for outdoor installation. Equip gauges with an isolation petcock. All wetted parts shall be fabricated of 316 stainless steel.

2. Thermometers: Provide bimetal thermometers on the inlet and discharge sides of the fan with a scale range of 0° to 150° F. Minimum scale size shall be 5-inches. All wetted parts shall be fabricated of 316 stainless steel

3. Flexible Connectors: Flexible connectors shall have sufficient flexibility to isolate motor vibrations from the ductwork system. Flexible connector material and connections shall be suitable for continuous service, outdoor installation and exposure to a moist airstream with an average H_2S concentration of 50.0 ppm.

E. Electrical Control Panel:

1. Provide (1) NEMA 4X electrical control panel for the fan and odour control systems suitable for operation in an outdoor location in British Columbia. All electrical equipment for the operation of the odour control system, including the fan, shall be located in the electrical control panel. Components include but are not limited to the following:

    a. Main disconnect (thermal-magnetic circuit breaker)

    b. Circuit breakers, 120 VAC, quantity as required plus 3 spares for future heat tracing circuits.

    c. Control circuit transformer

    d. Individually protected outlets (receptacles) for system start-up

    e. Motor starter for the odour control fan (combination starter with motor circuit protector, magnetic starter, overload protection, control power transformer with primary and secondary fuses, start/stop pushbuttons, run light and overload alarm light).

2. The control panel shall be located outside of hazardous locations as outlined in NFPA-820 including within 3 feet of a leakage source such as the odour control fan and odour control ductwork.

3.0 EXECUTION

3.1 INSTALLATION

A. Equipment shall be installed in strict conformance with the manufacturer's installation instructions. All equipment shall be installed level and plumb. Fan, motors and enclosures shall be anchor-bolted to a concrete pad.

B. The MANUFACTURER shall review and approve the equipment installation prior to initiating field testing of the fan and performance testing of the odour control system's mechanical and electrical components.

3.2 FIELD TESTING

The equipment shall be tested in operation to demonstrate smooth operation, freedom from vibration and objectionable noise, and to demonstrate conformance to the specified ratings. Defective equipment and equipment damaged in the course of installation or testing shall be replaced or repaired in a manner meeting with the approval of the ENGINEER.

3.3 FIELD PAINTING

Equipment shall be field painted in accordance with the Contract Documents, except that fiberglass material shall not be painted. Fiberglass color shall be impregnated in the exterior gel coat.

END OF SECTION

SEWAGE FORCEMAINS

1.8 Measurement and Payment

.11 ***(Add to this Clause)***

Payment for wyes, tees, bends, blind flanges and caps will be made for items identified on Contract Drawings and installed as part of the forcemain as described under 1.8.2 of this section.

.12 ***(Add to this Clause)***

Payment for the odour control and pipework will include all labour, equipment and materials. Payment will be by lump sum as per the Schedule of Quantities and Prices.

END OF SECTION 33 34 01

City of Campbell River

WATERFRONT SEWER SYSTEM UPGRADES - PHASE 1
TENDER SUBMISSION

KEY PLAN
SCALE: 1:5000

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO CITY CAMPBELL RIVER BYLAWS AND MMCD STANDARDS AND DRAWINGS, PLATINUM ADDITION.
2. LOCATION OF UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED BY USE OF A PIPE LOCATOR AND MANUAL DIGGING WHERE REQUIRED. EXISTING SERVICE LOCATIONS ARE SHOWN TO INDICATE THE EXISTENCE OF THE SPECIFIED SERVICE ONLY AND ARE NOT NECESSARILY COMPLETE OR SHOWN IN THE CORRECT LOCATION. EXPOSE ALL CONNECTION AND CROSSING POINTS AND CONFIRM DEPTHS PRIOR TO INFRASTRUCTURE INSTALLATION. PROTECT SERVICES AS REQUIRED.
3. ALL PIPE BEDDING TO BE IN ACCORDANCE WITH MMCD GRADATION TABLES.
4. ALL DIMENSIONS ARE IN METRES AND DECIMALS THEREOF, UNLESS OTHERWISE SPECIFIED.
5. CONTACT BC ONE CALL AT 1-800-474-6886 FOR FORTIS GAS, HYDRO AND TELUS LOCATIONS AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
6. REFER TO DRAWINGS FOR SITE SPECIFIC NOTES AND COMMENTS.
7. ENSURE CONTINUOUS AND SAFE ACCESS FOR VEHICLES AND PEDESTRIANS TO ALL LOTS/PROPERTIES DURING CONSTRUCTION.
8. ALL DRIVEWAYS DISTURBED DURING CONSTRUCTION TO BE REPLACED TO ORIGINAL CONDITION.
9. QUANTITIES FOR SURFACE RESTORATION ASSOCIATED WITH THE SANITARY SEWER INSTALLATION HAVE BEEN CALCULATED ASSUMING THE LIMIT OF EXCAVATION NOTED ON THE DRAWINGS. CONTRACTOR MAY ONLY EXCAVATE OUTSIDE THE LIMIT OF EXCAVATION NOTED ON THE DRAWINGS WITH THE ENGINEER'S WRITTEN PERMISSION. CONTRACTOR TO PROVIDE ADEQUATE TRENCH SHORING TO ENSURE TRENCHING REMAINS WITHIN THE LIMITS SPECIFIED. UNAUTHORIZED EXCAVATION OUTSIDE THE APPROVED LIMITS RESULTING IN ADDITIONAL SURFACE RESTORATION WILL NOT BE COMPENSATED.
10. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION SURVEY LAYOUT. STANTEC WILL PROVIDE DIGITAL FILE FOR LAYOUT PURPOSES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM LOCAL MONUMENTS/CONTROL PRIOR TO TENDER AND CONSTRUCTION.
11. EXISTING SEWER SYSTEMS TO REMAIN ACTIVE DURING CONSTRUCTION AND ABANDONED ONLY WHEN THE NEW SYSTEM IS COMMISSIONED.

ENVIRONMENTAL NOTES:

ABIDE BY THE CITY OF CAMPBELL RIVER EROSION AND SEDIMENTATION CONTROL BYLAW AND MMCD PLATINUM SPECIFICATIONS FOR ENVIRONMENTAL PROTECTION DURING CONSTRUCTION.

LEGEND

PROPOSED		EXISTING
	ASPHALT	
	ASPHALT CURB	
	GRAVEL	
	PROPERTY LINE	
	RIGHT OF WAY	
	TOP OF BANK	
	BOTTOM OF BANK	
	CONCRETE BARRIER	
	WALL	
	FENCE	X
	SWALE	
	OPEN DITCH	
D	STORM DRAIN	D
	STORM DRAIN ABANDONED	D
S	SANITARY	S
	SANITARY ABANDONED	S
SFM	SANITARY FORCE MAIN	SFM
W	WATERMAIN	W
	U/G HYDRO	H
	U/G STREET LIGHTS	UE
	TELE	T
	NATURAL GAS	G
	DRAIN PUMPSTATION	
	STORM DRAIN MANHOLE	D
	CATCH BASIN	
	DRAIN CAP	
	HEADWALL	
	SANITARY RESIDENTIAL PUMP SERVICE	
	SANITARY MANHOLE	S
	SANITARY INSPECTION CHAMBER	
	SANITARY CAP	
	SANITARY VALVE	
	ODOUR CONTROL UNIT	
	WATER METER	
	WATER SERVICE	W
	WATER VALVE	
	WATER CAP	
	FIRE HYDRANT	
	UTILITY POLE	U.P.
	SAWCUT LINE	
	CONCRETE SIDEWALK REPLACEMENT	
	SPECIALTY LANDSCAPE RESTORATION	

DRAWING LIST

Dwg No	Drawing Title
C000	COVER SHEET - GENERAL NOTES, LEGEND, KEY PLAN AND DRAWING LIST
C101	PLAN AND PROFILE STA 1+000 TO STA 1+360
C102	PLAN AND PROFILE STA 1+360 TO STA 1+720
C103	PLAN AND PROFILE STA 1+720 TO STA 2+080
C104	PLAN AND PROFILE STA 2+080 TO STA 2+440
C105	PLAN AND PROFILE STA 2+440 TO STA 2+525
C106	FUTURE LIFT STATION #18 SYSTEM UPGRADE
C107	SANITARY FORCEMAIN AND DRAIN PLAN AND PROFILE RETAINING WALL DETAILS
C201	CIVIL DETAILS
C202	CIVIL DETAILS

BC 1 CALL 1-800-474-6886

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NO.	REVISION	APP'D BY	DATE	CONST'D BY	DATE
2	ISSUED FOR TENDER	AG	04/26/18		
1	ISSUED FOR 90% REVIEW	AG	11/17/17		

DESIGNED: SS	SCALE: 1:500 H, 1:100 V
DRAWN: TG	DATE: 03/16/18
CHECKED: TB	DATE: 03/16/18
APPROVED: AG	DATE: 03/16/18

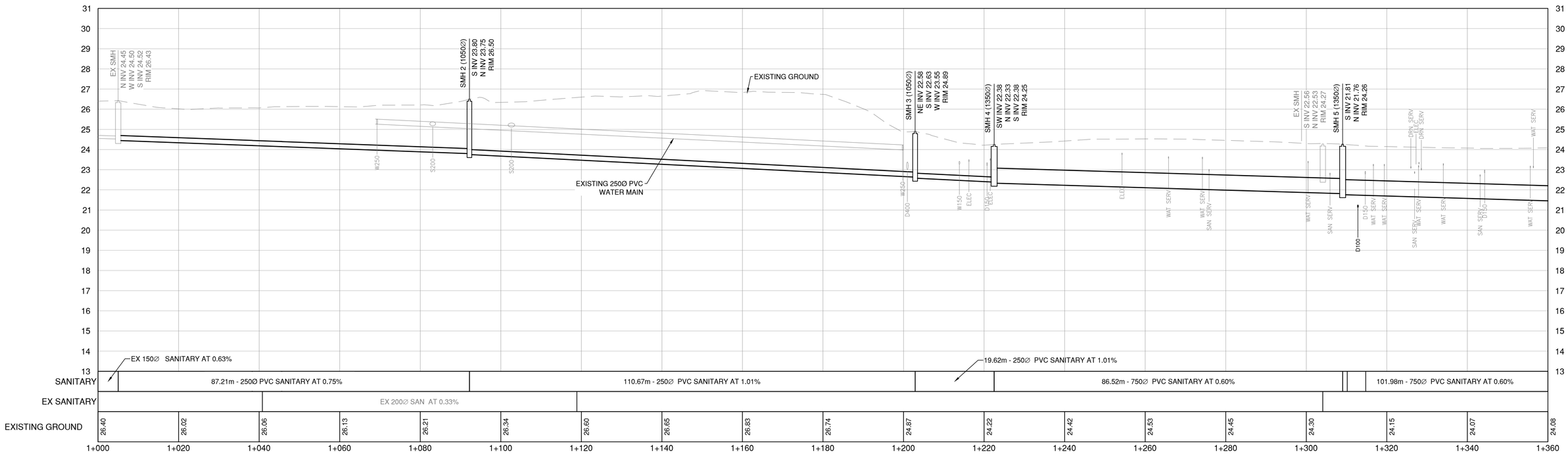
Stantec
400-655 Tyee Road
Victoria, BC V9A 6X5
www.stantec.com

TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
COVER SHEET – GENERAL NOTES, LEGEND, KEY PLAN AND DRAWING LIST

DRAWING NO. 17-524- C000
PROJECT: 111720050
SHEET 1 OF 10
REV.

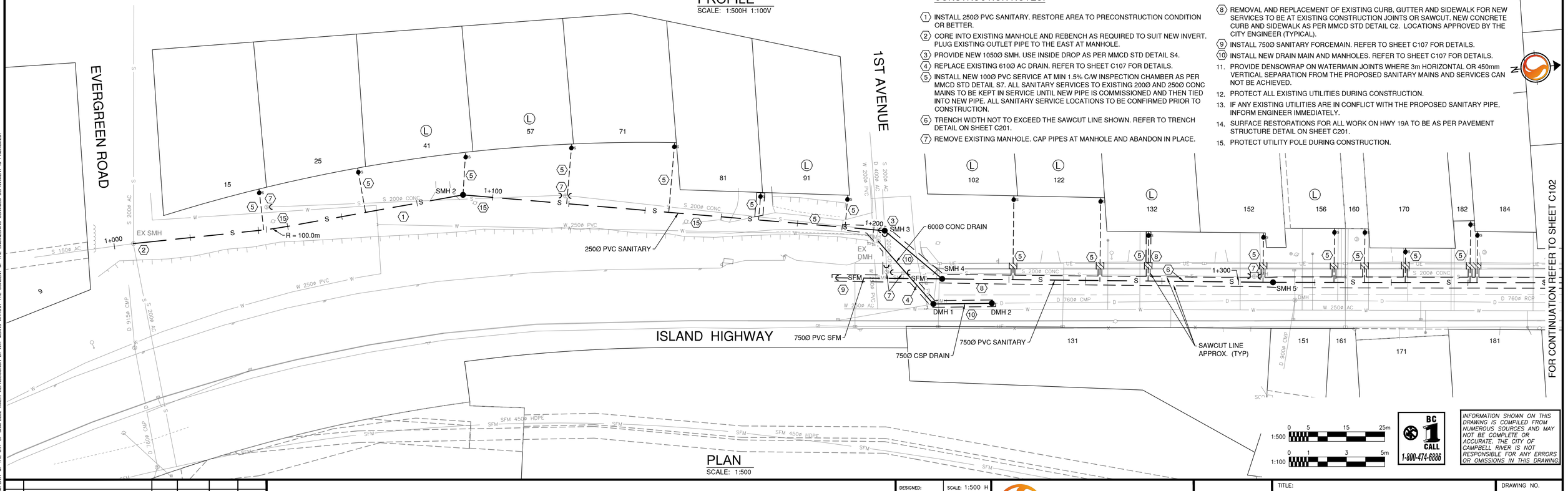
DESTROY PRINTS OF PREVIOUS REVISION

DRAWING PATH: W:\111\active\111720050\4_drawings_current\civil\20050_ph1_cover.dwg Tab c000 Apr 27, 2018 2:08:29pm



PROFILE
SCALE: 1:500H 1:100V

PLAN
SCALE: 1:500



CONSTRUCTION NOTES:

1. INSTALL 250Ø PVC SANITARY. RESTORE AREA TO PRECONSTRUCTION CONDITION OR BETTER.
2. CORE INTO EXISTING MANHOLE AND REBENCH AS REQUIRED TO SUIT NEW INVERT. PLUG EXISTING OUTLET PIPE TO THE EAST AT MANHOLE.
3. PROVIDE NEW 1050Ø SMH. USE INSIDE DROP AS PER MMCD STD DETAIL S4.
4. REPLACE EXISTING 610Ø AC DRAIN. REFER TO SHEET C107 FOR DETAILS.
5. INSTALL NEW 100Ø PVC SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AS PER MMCD STD DETAIL S7. ALL SANITARY SERVICES TO EXISTING 200Ø AND 250Ø CONC MAINS TO BE KEPT IN SERVICE UNTIL NEW PIPE IS COMMISSIONED AND THEN TIED INTO NEW PIPE. ALL SANITARY SERVICE LOCATIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
6. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
7. REMOVE EXISTING MANHOLE. CAP PIPES AT MANHOLE AND ABANDON IN PLACE.
8. REMOVAL AND REPLACEMENT OF EXISTING CURB, GUTTER AND SIDEWALK FOR NEW SERVICES TO BE AT EXISTING CONSTRUCTION JOINTS OR SAWCUT. NEW CONCRETE CURB AND SIDEWALK AS PER MMCD STD DETAIL C2. LOCATIONS APPROVED BY THE CITY ENGINEER (TYPICAL).
9. INSTALL 750Ø SANITARY FORCEMAIN. REFER TO SHEET C107 FOR DETAILS.
10. INSTALL NEW DRAIN MAIN AND MANHOLES. REFER TO SHEET C107 FOR DETAILS.
11. PROVIDE DENSOWRAP ON WATERMAIN JOINTS WHERE 3m HORIZONTAL OR 450mm VERTICAL SEPARATION FROM THE PROPOSED SANITARY MAINS AND SERVICES CAN NOT BE ACHIEVED.
12. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
13. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY PIPE, INFORM ENGINEER IMMEDIATELY.
14. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.
15. PROTECT UTILITY POLE DURING CONSTRUCTION.

1:500 0 5 15 25m
1:100 0 1 3 5m

BC 1 CALL 1-800-474-6886

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1	ISSUED FOR 90% REVIEW	AG	11/17/17		

DESIGNED: SS | SCALE: 1:500 H 1:100 V
DRAWN: TG | DATE: 03/16/18
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APPROVED: AG | DATE: 03/16/18

Stantec
400-655 Tyee Road
Victoria, BC V9A 6X5
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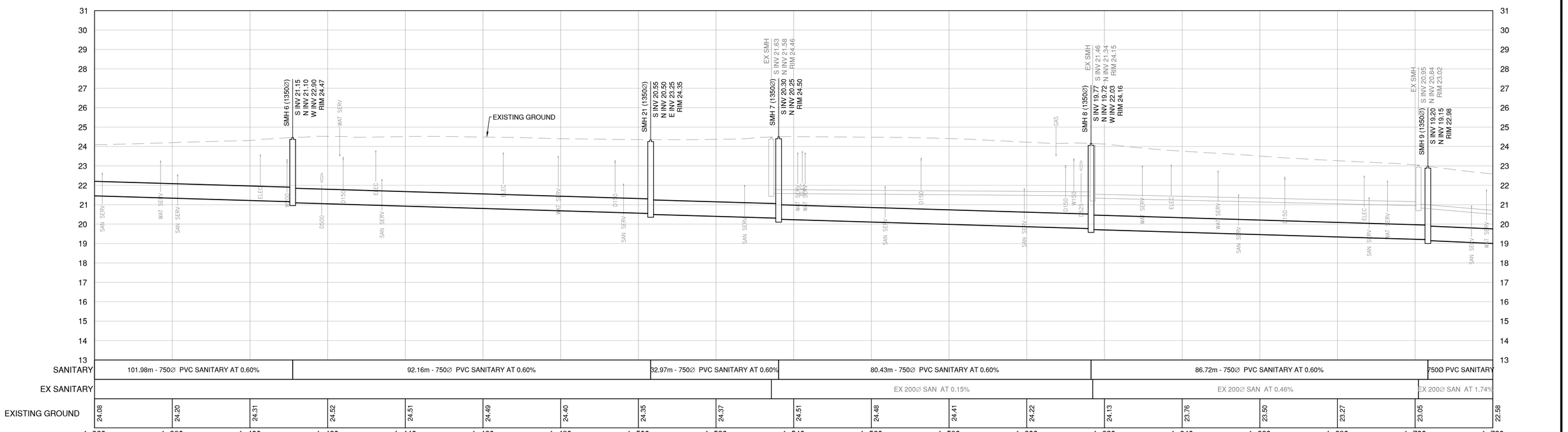
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
PLAN AND PROFILE
STA 1+000 TO STA 1+360

DRAWING NO. 17-524-C101
PROJECT: 111720050
SHEET 2 OF 10
REV.

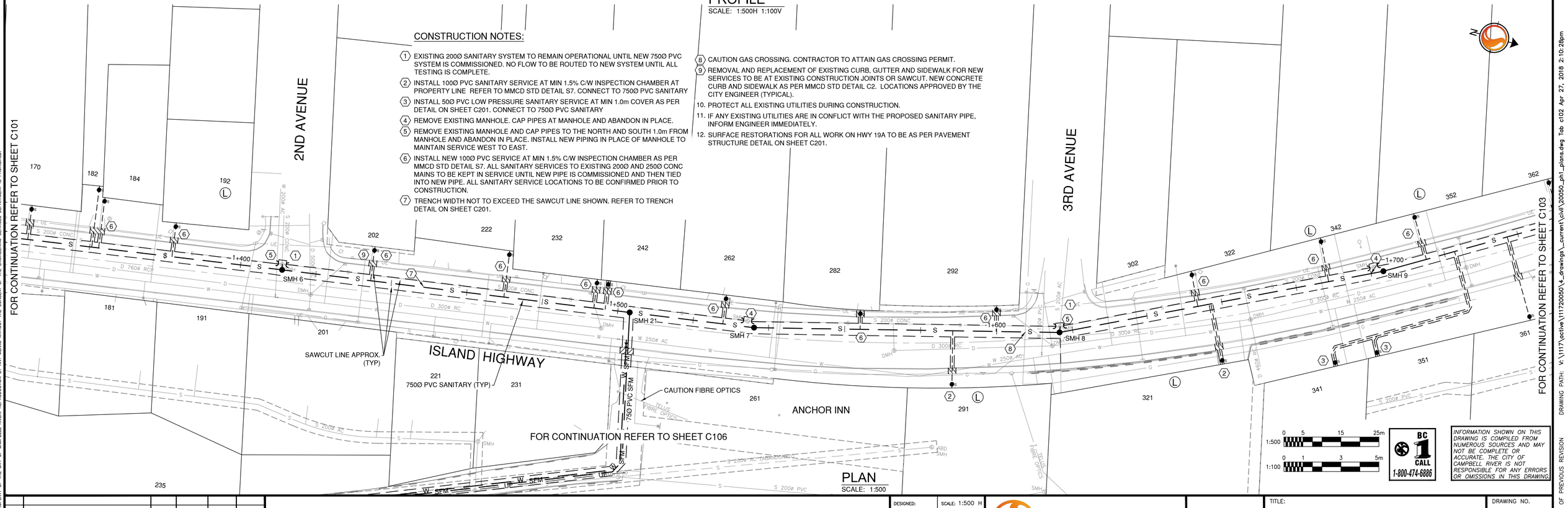
DRAWING PATH: V:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab c101 Apr 27, 2018 2:10:04pm



PROFILE
SCALE: 1:500H 1:100V

CONSTRUCTION NOTES:

1. EXISTING 200Ø SANITARY SYSTEM TO REMAIN OPERATIONAL UNTIL NEW 750Ø PVC SYSTEM IS COMMISSIONED. NO FLOW TO BE ROUTED TO NEW SYSTEM UNTIL ALL TESTING IS COMPLETE.
2. INSTALL 100Ø PVC SANITARY SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AT PROPERTY LINE REFER TO MMCD STD DETAIL S7. CONNECT TO 750Ø PVC SANITARY
3. INSTALL 50Ø PVC LOW PRESSURE SANITARY SERVICE AT MIN 1.0m COVER AS PER DETAIL ON SHEET C201. CONNECT TO 750Ø PVC SANITARY
4. REMOVE EXISTING MANHOLE. CAP PIPES AT MANHOLE AND ABANDON IN PLACE.
5. REMOVE EXISTING MANHOLE AND CAP PIPES TO THE NORTH AND SOUTH 1.0m FROM MANHOLE AND ABANDON IN PLACE. INSTALL NEW PIPING IN PLACE OF MANHOLE TO MAINTAIN SERVICE WEST TO EAST.
6. INSTALL NEW 100Ø PVC SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AS PER MMCD STD DETAIL S7. ALL SANITARY SERVICES TO EXISTING 200Ø AND 250Ø CONC MAINS TO BE KEPT IN SERVICE UNTIL NEW PIPE IS COMMISSIONED AND THEN TIED INTO NEW PIPE. ALL SANITARY SERVICE LOCATIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
7. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
8. CAUTION GAS CROSSING. CONTRACTOR TO ATTAIN GAS CROSSING PERMIT.
9. REMOVAL AND REPLACEMENT OF EXISTING CURB, GUTTER AND SIDEWALK FOR NEW SERVICES TO BE AT EXISTING CONSTRUCTION JOINTS OR SAWCUT. NEW CONCRETE CURB AND SIDEWALK AS PER MMCD STD DETAIL C2. LOCATIONS APPROVED BY THE CITY ENGINEER (TYPICAL).
10. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
11. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY PIPE, INFORM ENGINEER IMMEDIATELY.
12. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.



PLAN
SCALE: 1:500

0 5 15 25m (1:500)
0 1 3 5m (1:100)

BC 1 CALL 1-800-474-6886

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APPROVED: AG	DATE: 03/16/18

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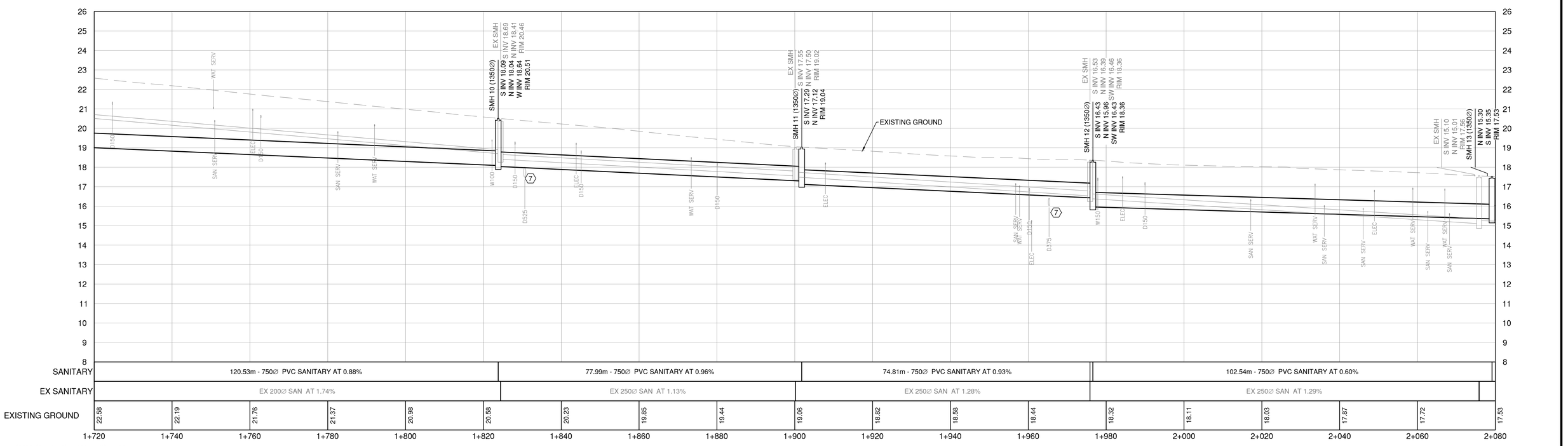
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
PLAN AND PROFILE
STA 1+360 TO STA 1+720

DRAWING NO. 17-524- C102
PROJECT: 111720050
SHEET 3 OF 10
REV.

DRAWING PATH: V:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab c102 Apr 27, 2018 2:10:28pm

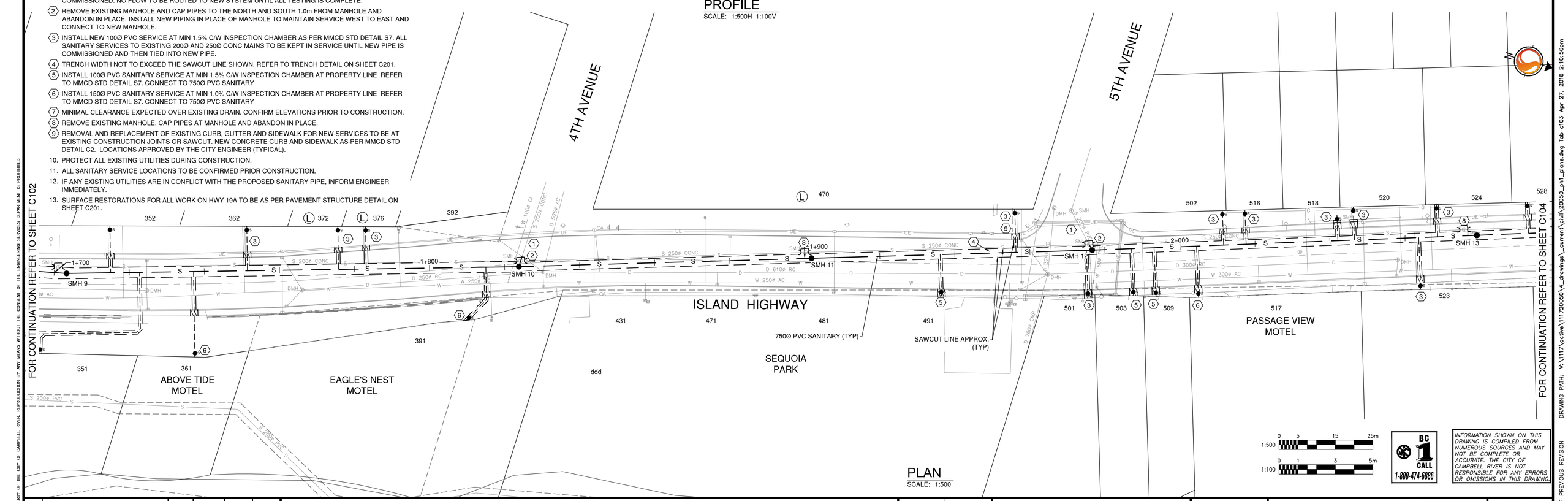
DESTROY PRINTS OF PREVIOUS REVISION



PROFILE
SCALE: 1:500H 1:100V

CONSTRUCTION NOTES:

1. EXISTING 200Ø SANITARY SYSTEM TO REMAIN OPERATIONAL UNTIL NEW 750Ø PVC SYSTEM IS COMMISSIONED. NO FLOW TO BE ROUTED TO NEW SYSTEM UNTIL ALL TESTING IS COMPLETE.
2. REMOVE EXISTING MANHOLE AND CAP PIPES TO THE NORTH AND SOUTH 1.0m FROM MANHOLE AND ABANDON IN PLACE. INSTALL NEW PIPING IN PLACE OF MANHOLE TO MAINTAIN SERVICE WEST TO EAST AND CONNECT TO NEW MANHOLE.
3. INSTALL NEW 100Ø PVC SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AS PER MMCD STD DETAIL S7. ALL SANITARY SERVICES TO EXISTING 200Ø AND 250Ø CONC MAINS TO BE KEPT IN SERVICE UNTIL NEW PIPE IS COMMISSIONED AND THEN TIED INTO NEW PIPE.
4. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
5. INSTALL 100Ø PVC SANITARY SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AT PROPERTY LINE REFER TO MMCD STD DETAIL S7. CONNECT TO 750Ø PVC SANITARY
6. INSTALL 150Ø PVC SANITARY SERVICE AT MIN 1.0% C/W INSPECTION CHAMBER AT PROPERTY LINE REFER TO MMCD STD DETAIL S7. CONNECT TO 750Ø PVC SANITARY
7. MINIMAL CLEARANCE EXPECTED OVER EXISTING DRAIN. CONFIRM ELEVATIONS PRIOR TO CONSTRUCTION.
8. REMOVE EXISTING MANHOLE. CAP PIPES AT MANHOLE AND ABANDON IN PLACE.
9. REMOVAL AND REPLACEMENT OF EXISTING CURB, GUTTER AND SIDEWALK FOR NEW SERVICES TO BE AT EXISTING CONSTRUCTION JOINTS OR SAWCUT. NEW CONCRETE CURB AND SIDEWALK AS PER MMCD STD DETAIL C2. LOCATIONS APPROVED BY THE CITY ENGINEER (TYPICAL).
10. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
11. ALL SANITARY SERVICE LOCATIONS TO BE CONFIRMED PRIOR CONSTRUCTION.
12. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY PIPE, INFORM ENGINEER IMMEDIATELY.
13. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.



PLAN
SCALE: 1:500

0 5 15 25m
1:500

0 1 3 5m
1:100

BC 1 CALL 1-800-474-6886

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APPROVED: AG	DATE: 03/16/18

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Victoria, BC V9A 6X5
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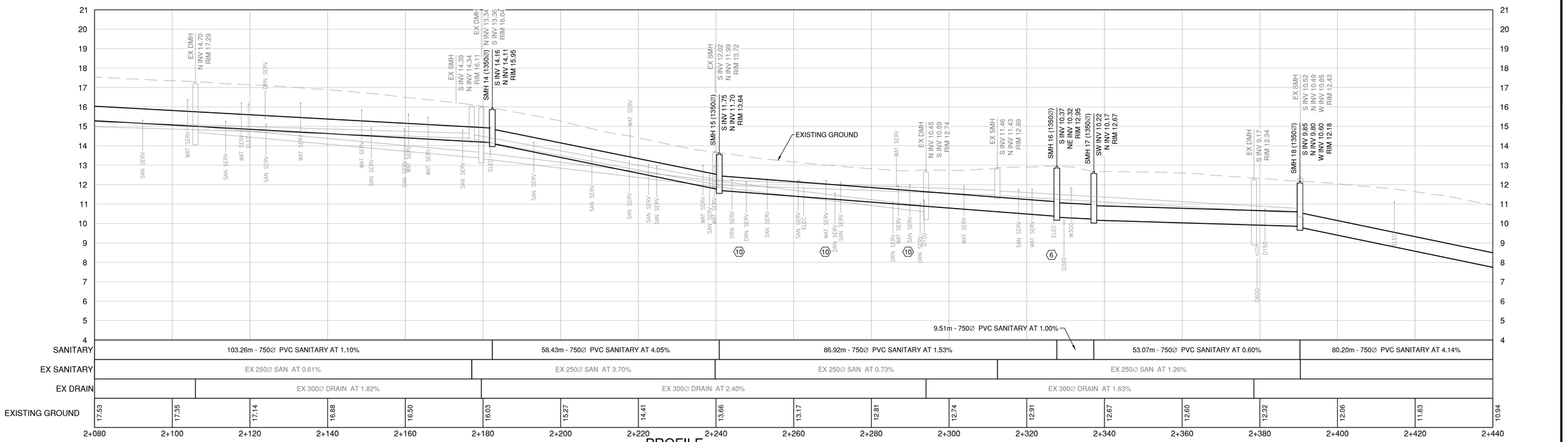
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
PLAN AND PROFILE
STA 1+720 TO STA 2+080

DRAWING NO. 17-524-C103
PROJECT: 111720050
SHEET 4 OF 10
REV.

DRAWING PATH: V:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab c103 Apr 27, 2018 2:10:56pm



PROFILE
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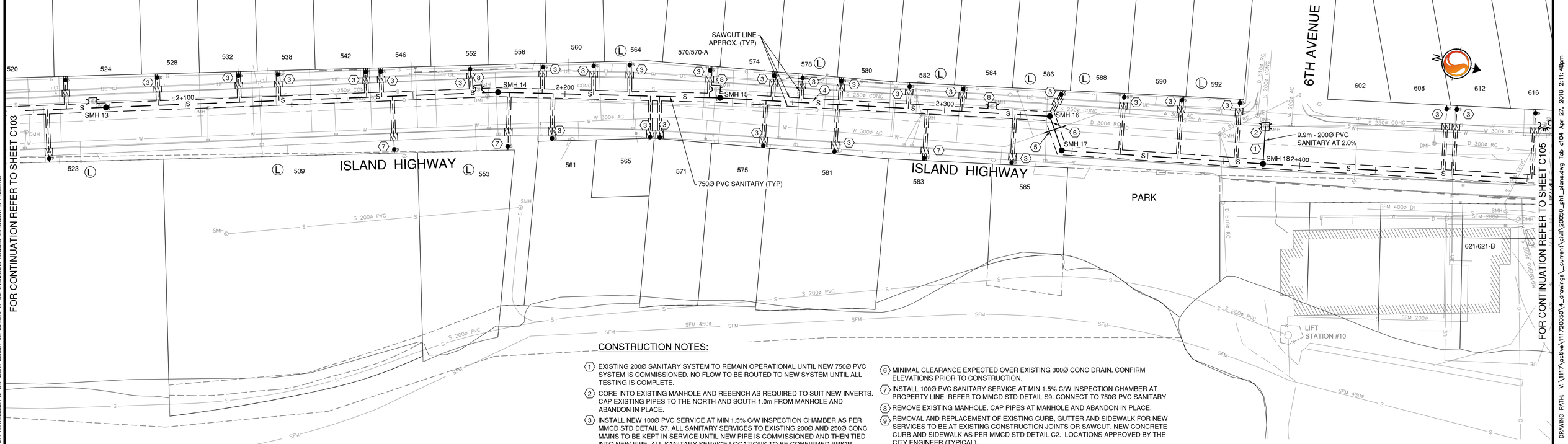

PLAN
SCALE: 1:500

CONSTRUCTION NOTES:

1. EXISTING 200Ø SANITARY SYSTEM TO REMAIN OPERATIONAL UNTIL NEW 750Ø PVC SYSTEM IS COMMISSIONED. NO FLOW TO BE ROUTED TO NEW SYSTEM UNTIL ALL TESTING IS COMPLETE.
2. CORE INTO EXISTING MANHOLE AND REBENCH AS REQUIRED TO SUIT NEW INVERTS. CAP EXISTING PIPES TO THE NORTH AND SOUTH 1.0m FROM MANHOLE AND ABANDON IN PLACE.
3. INSTALL NEW 100Ø PVC SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AS PER MMCD STD DETAIL S7. ALL SANITARY SERVICES TO EXISTING 200Ø AND 250Ø CONC MAINS TO BE KEPT IN SERVICE UNTIL NEW PIPE IS COMMISSIONED AND THEN TIED INTO NEW PIPE. ALL SANITARY SERVICE LOCATIONS TO BE CONFIRMED PRIOR CONSTRUCTION.
4. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
5. CONFIRM ELEVATION OF EXISTING 300Ø AC WATERMAIN PRIOR TO CONSTRUCTION. ALLOW FOR REPLACEMENT OF SECTION DURING CROSSING (ASSUME 2 FLEXIBLE COUPLINGS AND 6m OF 300Ø PVC). CONTINUOUS WATER SERVICE TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
6. MINIMAL CLEARANCE EXPECTED OVER EXISTING 300Ø CONC DRAIN. CONFIRM ELEVATIONS PRIOR TO CONSTRUCTION.
7. INSTALL 100Ø PVC SANITARY SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AT PROPERTY LINE REFER TO MMCD STD DETAIL S9. CONNECT TO 750Ø PVC SANITARY
8. REMOVE EXISTING MANHOLE. CAP PIPES AT MANHOLE AND ABANDON IN PLACE.
9. REMOVAL AND REPLACEMENT OF EXISTING CURB, GUTTER AND SIDEWALK FOR NEW SERVICES TO BE AT EXISTING CONSTRUCTION JOINTS OR SAWCUT. NEW CONCRETE CURB AND SIDEWALK AS PER MMCD STD DETAIL C2. LOCATIONS APPROVED BY THE CITY ENGINEER (TYPICAL).
10. POTENTIAL CONFLICTS WITH DRAIN SERVICES. CONFIRM ELEVATIONS PRIOR TO CONSTRUCTION.
11. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
12. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY PIPE, INFORM ENGINEER IMMEDIATELY.
13. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.

1:500 0 5 15 25m
1:100 0 1 3 5m

BC 1 CALL 1-800-474-6886

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Victoria, BC V9A 6X5
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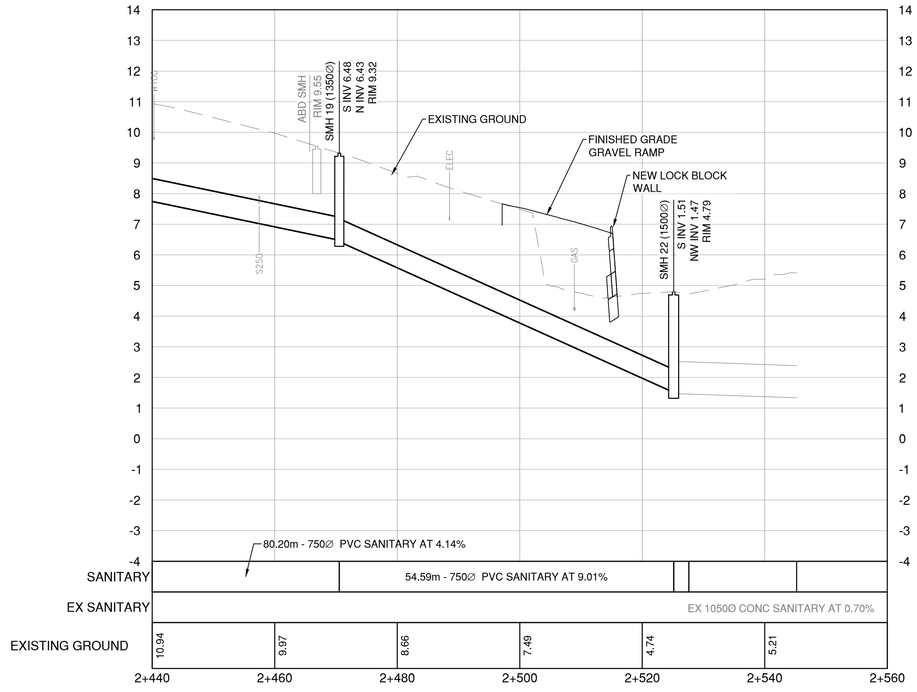
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
PLAN AND PROFILE
STA 2+080 TO STA 2+440

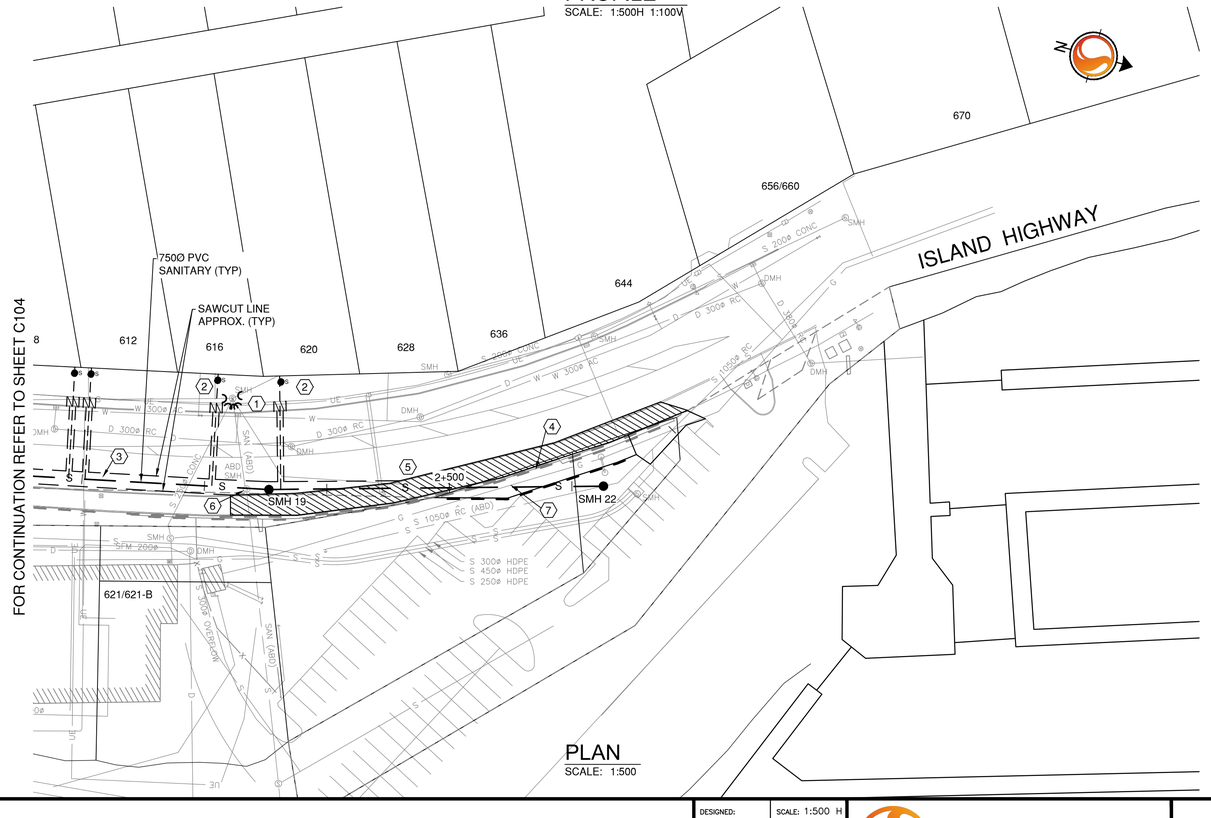
DRAWING NO. 17-524-C104
PROJECT: 111720050
SHEET 5 OF 10
REV.

DRAWING PATH: V:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab: c104 Apr 27, 2018 2:11:48pm



PROFILE

SCALE: 1:500H 1:100V



PLAN

SCALE: 1:500

CONSTRUCTION NOTES:

1. EXISTING 200Ø SANITARY SYSTEM TO REMAIN OPERATIONAL UNTIL NEW 750Ø PVC SYSTEM IS COMMISSIONED. NO FLOW TO BE ROUTED TO NEW SYSTEM UNTIL ALL TESTING IS COMPLETE. ONCE NEW SYSTEM COMMISSIONED, REMOVE MANHOLE AND CAP ALL PIPES 1.0m FROM MANHOLE AND ABANDON IN PLACE.
2. INSTALL NEW 100Ø PVC SERVICE AT MIN 1.5% C/W INSPECTION CHAMBER AS PER MMCD STD DETAIL S7. ALL SANITARY SERVICES TO EXISTING 200Ø CONC MAINS TO BE KEPT IN SERVICE UNTIL NEW PIPE IS COMMISSIONED AND THEN TIED INTO NEW PIPE. ALL SANITARY SERVICE LOCATIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
3. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
4. RELOCATE LOCK BLOCK WALL. REFER TO SHEET C105.
5. REPLACE BRICK SIDEWALK PANELS AND CONC CURB TO MATCH EXISTING.
6. REMOVE ABANDONED SANITARY MANHOLE.
7. CAUTION GAS CROSSING. CONTRACTOR TO ATTAIN GAS CROSSING PERMIT.
8. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
9. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY PIPE, INFORM ENGINEER IMMEDIATELY.
10. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.

1:500 0 5 15 25m

1:100 0 1 3 5m

BC 1 CALL 1-800-474-6886

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APPROVED: AG	DATE: 03/16/18

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Victoria, BC V9A 6X5
www.stantec.com

TITLE:

WATERFRONT SEWER SYSTEM
UPGRADES
PLAN AND PROFILE
STA 2+440 TO STA 2+525

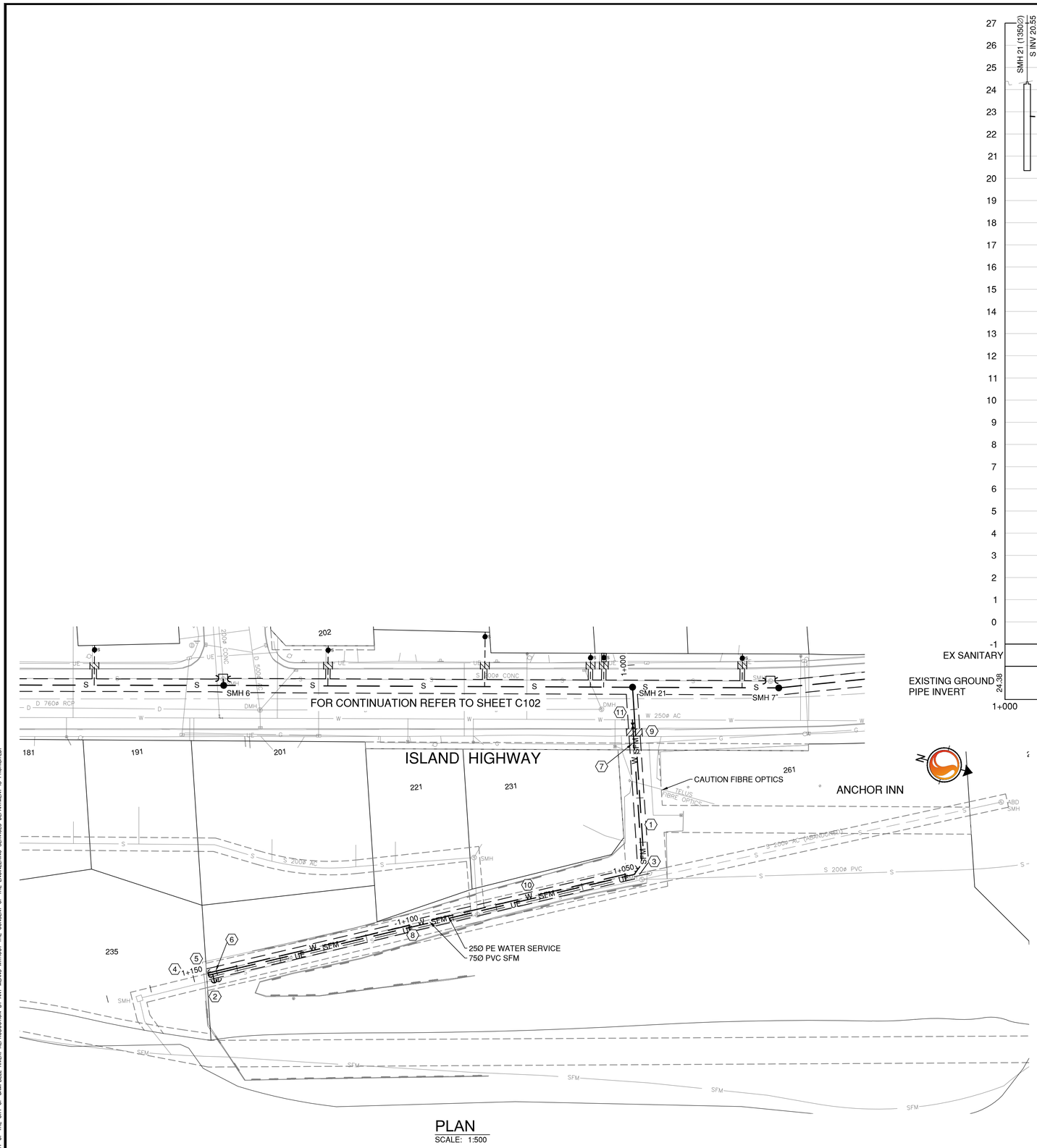
DRAWING NO. 17-524-C105

PROJECT: 111720050

SHEET 6 OF 10

REV.

DRAWING PATH: W:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab c105 Apr 27, 2018 2:12:16pm



PLAN
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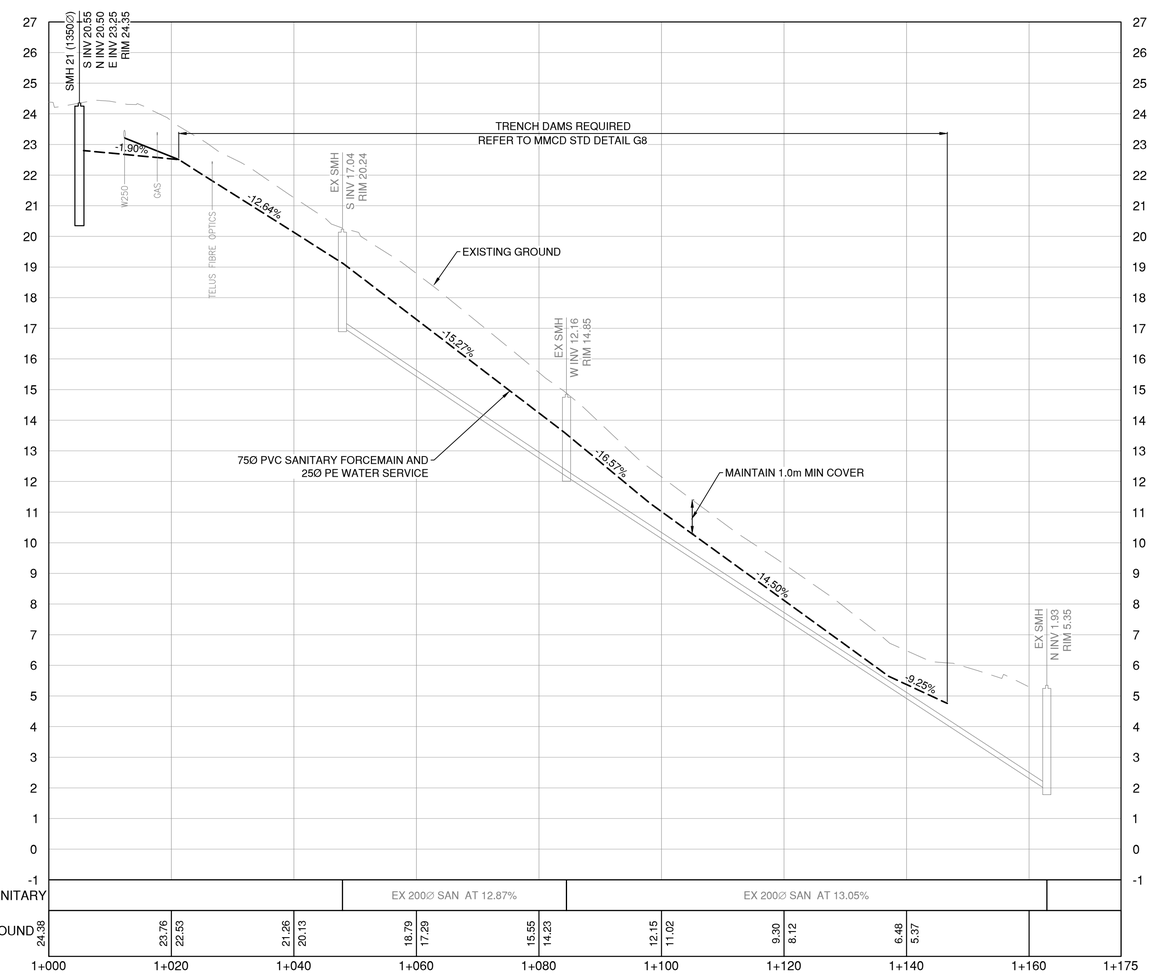

PROFILE
SCALE: 1:500H 1:100V

CONSTRUCTION NOTES:

1. INSTALL 75Ø PVC SANITARY FORCEMAIN WITH 1.0m MIN COVER AND CONNECT TO 750Ø SANITARY MAIN. REFER TO SHEET C102 FOR CONTINUATION.
2. PROVIDE 75x75x75Ø TEE AND CAP PIPES FOR FUTURE CONNECTION TO FUTURE LIFT STATION #18.
3. INSTALL 2 - 45° BENDS.
4. CONFIRM LOCATION AND ELEVATION OF SANITARY SERVICE AT PROPERTY LINE FOR 235 ISLAND HIGHWAY. PUMP MAY BE REQUIRED.
5. PROVIDE 25Ø PE WATER SERVICE AND CAP AT PROPERTY LINE OF 235 ISLAND HIGHWAY. INSTALL WATER METER AS PER MMCD STD DWG W2c.
6. PROVIDE 19Ø PE WATER SERVICE C/W TEE AND CAP PIPE FOR FUTURE LIFT STATION #18.
7. CAUTION GAS CROSSING. CONTRACTOR TO ATTAIN GAS CROSSING PERMIT.
8. SURFACE RESTORATION TO MATCH EXISTING.
9. REPLACE CONCRETE SIDEWALK PANELS AND CONCRETE CURB TO MATCH EXISTING.
10. TRENCH WIDTH NOT TO EXCEED THE SAWCUT LINE SHOWN. REFER TO TRENCH DETAIL ON SHEET C201.
11. MAKE TIE INTO EXISTING 250Ø AC PIPE WITH SADDLE AND CURB STOP. REFER TO MMCD STD DWG W2b FOR CONNECTION DETAIL.

1:500 0 5 15 25m
1:100 0 1 3 5m

BC 1 CALL 1-800-474-6886

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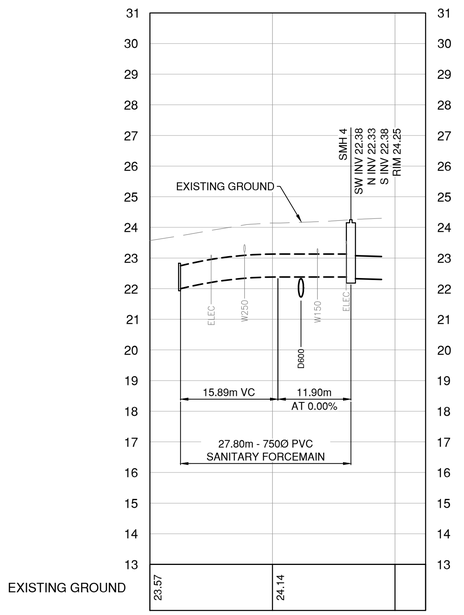
Stantec
400-655 Tyee Road
Victoria, BC V9A 6X5
www.stantec.com

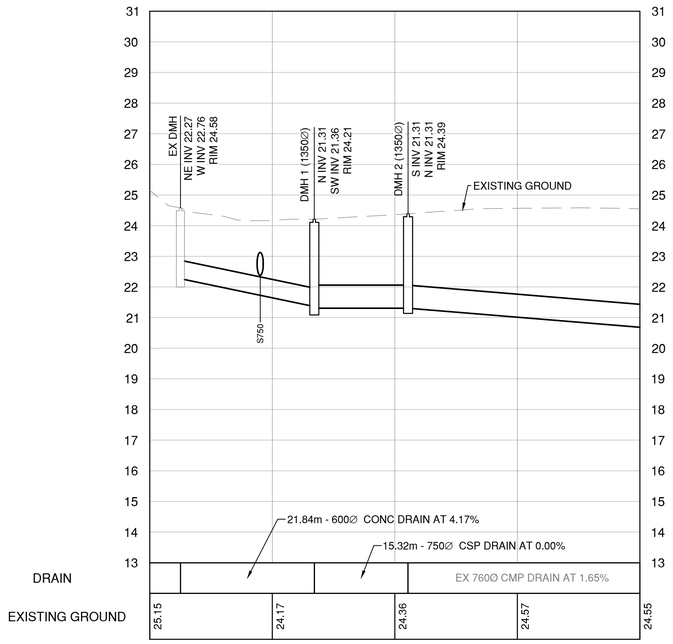
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
FUTURE LIFT STATION #18
SYSTEM UPGRADE

DRAWING NO. 17-524-C106
PROJECT: 111720050
SHEET 7 OF 10
REV.

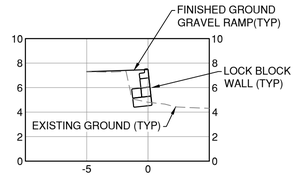
DRAWING PATH: V:\1117\active\111720050\4_drawings_current\civil\20050_ph1_plans.dwg Tab: c106 Apr 27, 2018 2:12:40pm



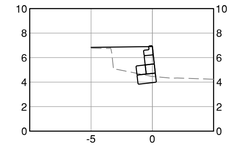
SANITARY FORCEMAIN PROFILE
SCALE: 1:500H 1:100V



DRAIN PROFILE
SCALE: 1:500H 1:100V



A - SECTION
SCALE: 1:250



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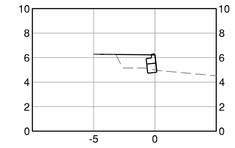

C - SECTION
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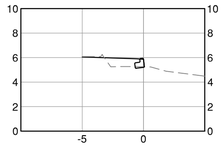

D - SECTION
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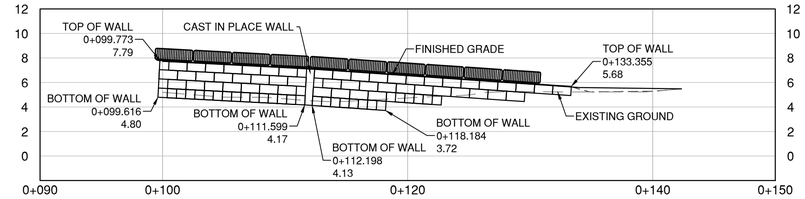
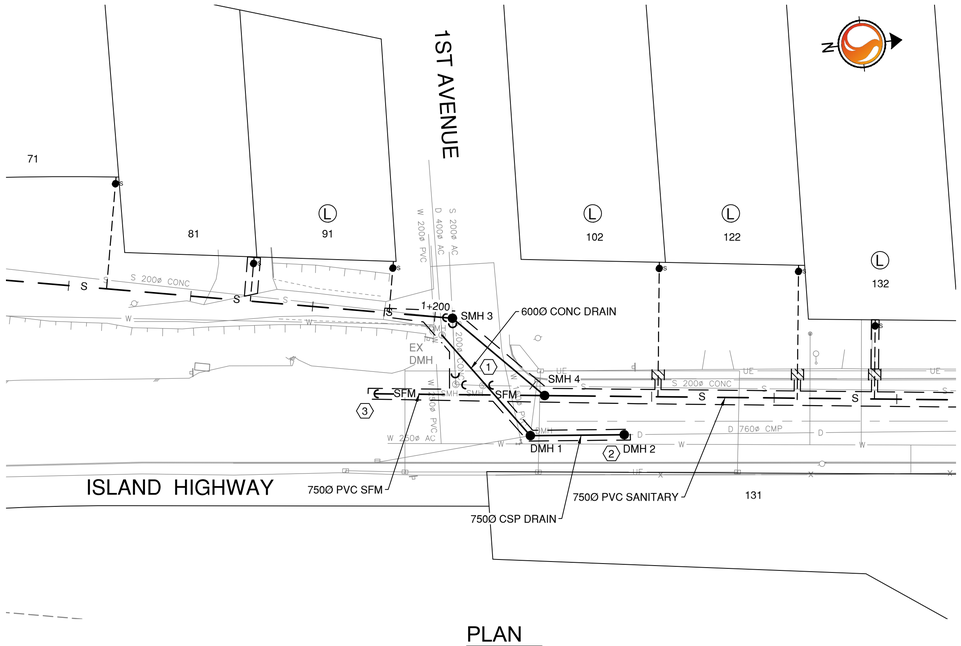


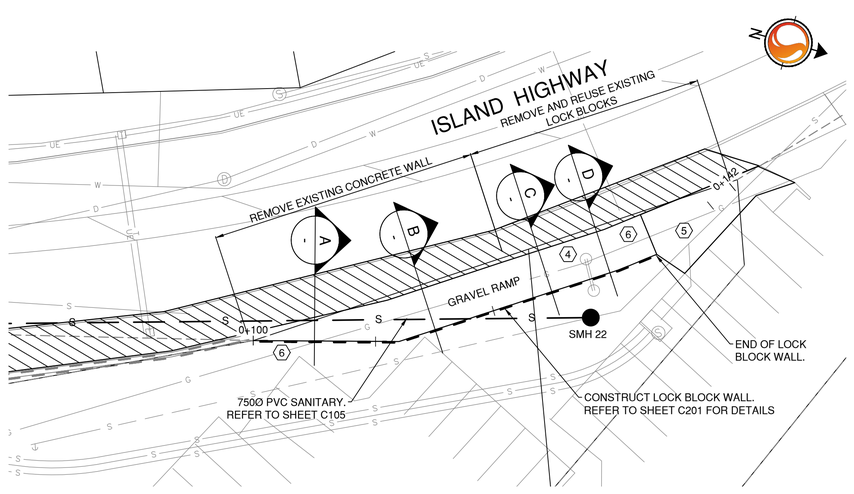
RETAINING WALL PROFILE
SCALE: 1:250



PLAN
SCALE: 1:500

CONSTRUCTION NOTES:

1. REPLACE EXISTING 610Ø AC DRAIN WITH 600Ø PVC DRAIN AND CONNECT TO MANOLES .
2. REMOVE EXISTING 760Ø CMP DRAIN AS SHOWN AND REPLACE WITH 750Ø CSP DRAIN AND INSTALL NEW MANHOLE.
3. INSTALL 750Ø PVC SANITARY FORCEMAIN AND CAP FOR FUTURE EXTENSION.
4. DISASSEMBLE EXISTING SIGN FOR REMOVAL FROM SITE BY CITY OF CAMPBELL RIVER.
5. PROVIDE 50mm ASPHALT AREA FROM END OF GRAVEL RAMP TO BACK OF PARKING.
6. GAS CROSSING. CONTRACTOR TO ATTAIN GAS CROSSING PERMIT.
7. PROVIDE DENSOWRAP ON WATERMAIN JOINTS WHERE 3m HORIZONTAL OR 450mm VERTICAL SEPARATION FROM THE PROPOSED SANITARY MAINS AND SERVICES CAN NOT BE ACHIEVED.
8. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
9. IF ANY EXISTING UTILITIES ARE IN CONFLICT WITH THE PROPOSED SANITARY OR DRAIN PIPE, INFORM ENGINEER IMMEDIATELY.
10. SURFACE RESTORATIONS FOR ALL WORK ON HWY 19A TO BE AS PER PAVEMENT STRUCTURE DETAIL ON SHEET C201.
11. PROTECT UTILITY POLES DURING CONSTRUCTION.



PLAN AT RETAINING WALL
SCALE: 1:250

1:500 0 5 15 25m
1:250 0 2.5 7.5 12.5m
1:100 0 1 3 5m

BC 1 CALL 1-800-474-6886

INFORMATION SHOWN ON THIS DRAWING IS COMPILED FROM NUMEROUS SOURCES AND MAY NOT BE COMPLETE OR ACCURATE. THE CITY OF CAMPBELL RIVER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING.

NO.	REVISION	APP'D BY	DATE	CONST'D BY	DATE
2	ISSUED FOR TENDER	AG	04/26/18		
1	ISSUED FOR 90% REVIEW	AG	11/17/17		

DESIGNED: SS | SCALE: 1:500 H, 1:100 V
DRAWN: TG | DATE: 03/16/18
CHECKED: TB | DATE: 03/16/18
APPROVED: AG | DATE: 03/16/18

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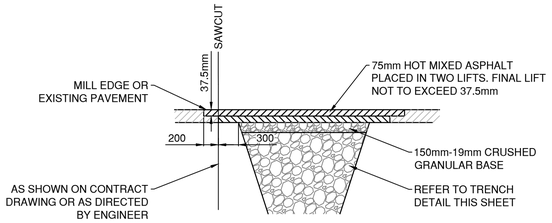
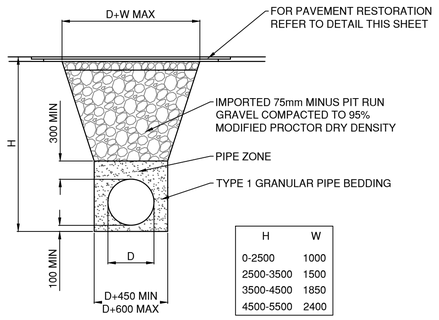
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
SANITARY FORCEMAIN AND DRAIN
PLAN AND PROFILE
RETAINING WALL DETAILS

DRAWING NO. 17-524-C107
PROJECT: 111720050
SHEET 8 OF 10
REV.

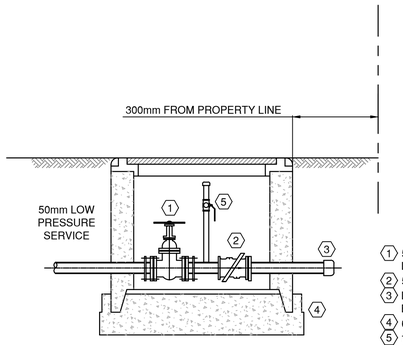


1 PAVEMENT RESTORATION DETAIL
SCALE: NTS



H	W
0-2500	1000
2500-3500	1500
3500-4500	1850
4500-5500	2400

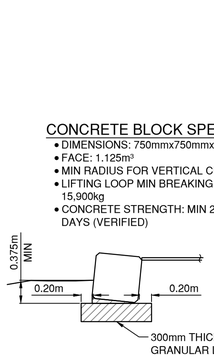
2 TYPICAL TRENCH DETAIL
SCALE: NTS



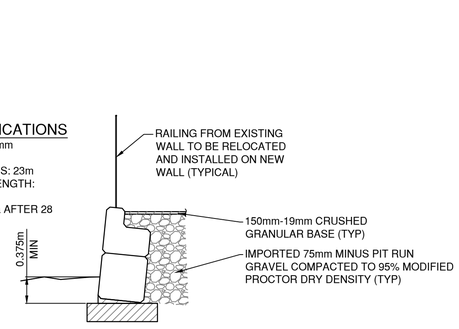
1. 50Ø GATE VALVE C/W HANDLE (BRASS) REMOVE OR LOCK HANDLE UPON COMPLETION
2. 50Ø CHECK VALVE (BRASS)
3. LEAVE SUFFICIENT ROOM FOR CAP REMOVAL AND 50 EXTENSION TO ON SITE PUMP UNIT
4. 600Ø C/O BARREL OR CAST IRON COVER
5. 12Ø VALVE AND CAP C/W 50Ø X 12Ø TEE (FOR PRESSURE TESTING)

3 LOW PRESSURE SERVICE CONNECTION DETAIL
SCALE: NTS

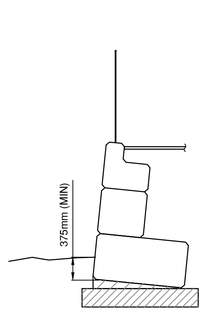
CONCRETE BLOCK SPECIFICATIONS
- DIMENSIONS: 750mmx750mmx1500mm
- FACE: 1.125m²
- MIN RADIUS FOR VERTICAL CURVES: 23m
- LIFTING LOOP MIN BREAKING STRENGTH: 15,900kg
- CONCRETE STRENGTH: MIN 20MPa AFTER 28 DAYS (VERIFIED)



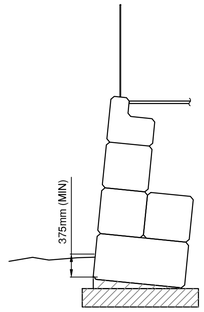
1 BLOCK HIGH
- VERTICAL SLOPE
- LEVEL FILL WITH TOP OF WALL



2 BLOCKS HIGH
- 1H:10V WALL SLOPE
- LEVEL FILL WITH TOP OF WALL
- 1.2m HIGH RAILING

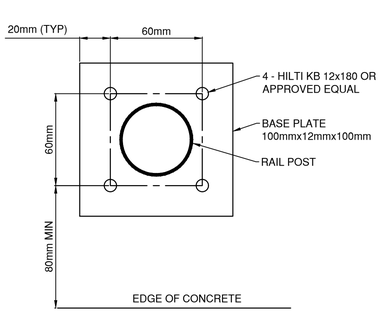


3 BLOCKS HIGH
- VERTICAL SLOPE
- LEVEL FILL WITH TOP OF WALL
- 1.5m HIGH FENCING
- LOWEST COURSE OF BLOCKS IS TURNED PERPENDICULAR TO THE WALL FACE



4 BLOCKS HIGH
- VERTICAL SLOPE
- LEVEL FILL WITH TOP OF WALL
- 1.5m HIGH FENCING
- LOWEST COURSE OF BLOCKS IS TURNED PERPENDICULAR TO THE WALL FACE
- ADDITIONAL BLOCK REQUIRED ON TOP OF THE IN TURNED ROW

4 INTERLOCKING CONCRETE BLOCK WALL INSTALLATION DETAILS
SCALE: NTS



5 HANDRAIL INSTALLATION DETAIL
SCALE: NTS

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DESIGNED: SS	SCALE: AS NOTED
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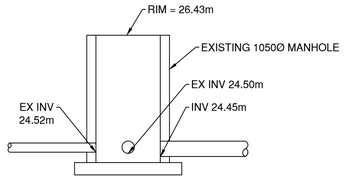
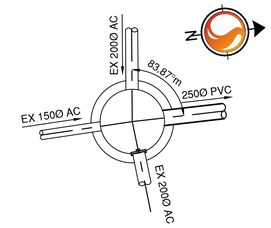
TITLE:
WATERFRONT SEWER SYSTEM UPGRADES

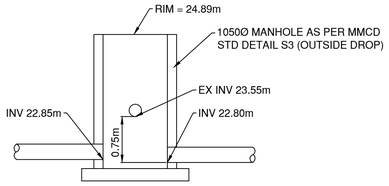
CIVIL DETAILS

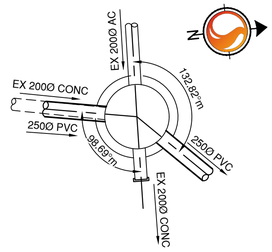
DRAWING NO. 17-524- C201
PROJECT: 111720050
SHEET 9 OF 10
REV.



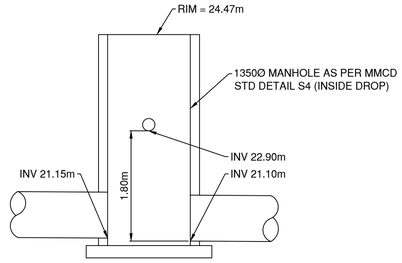


1 - EX SMH 1 - EVERGREEN RD
SCALE: NTS

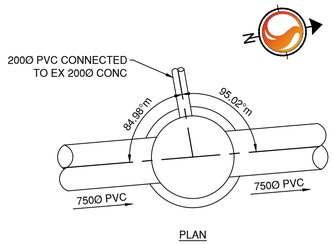




2 - SMH 3 - 1ST AVENUE
SCALE: NTS

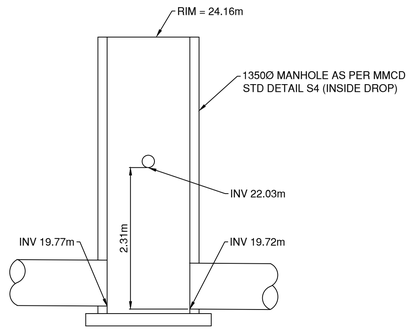


SECTION



PLAN

3 - SMH 6 - 2ND AVENUE
SCALE: NTS



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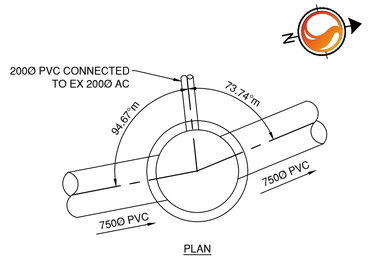
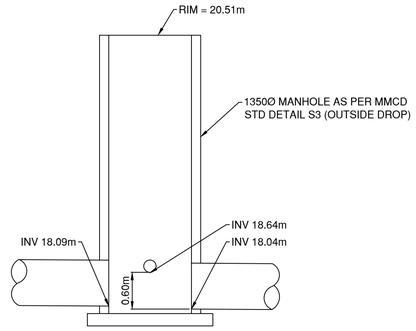


PLAN

4 - SMH 8 - 3RD AVENUE
SCALE: NTS



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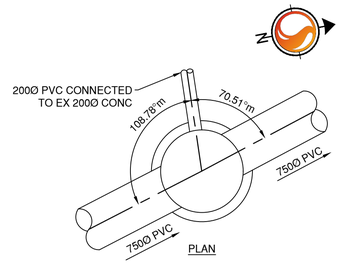
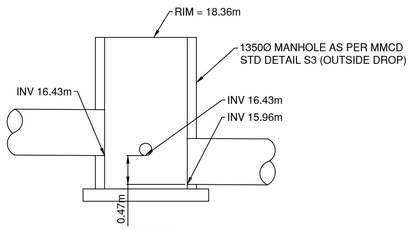


PLAN

5 - SMH 10 - 4TH AVENUE
SCALE: NTS



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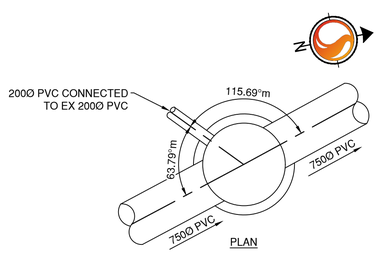
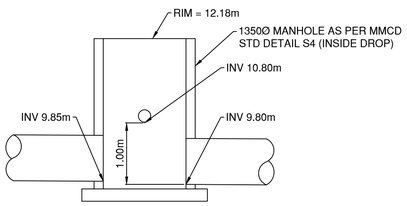


PLAN

6 - SMH 12 - 5TH AVENUE
SCALE: NTS



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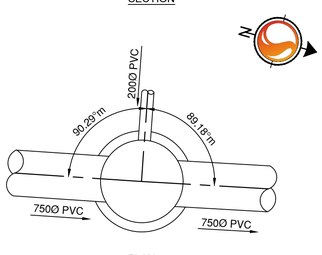
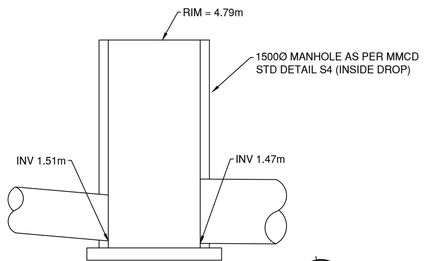


PLAN

7 - SMH 18 - 6TH AVENUE
SCALE: NTS



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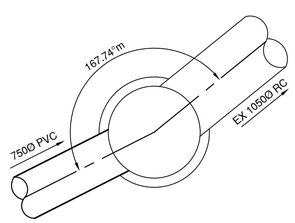
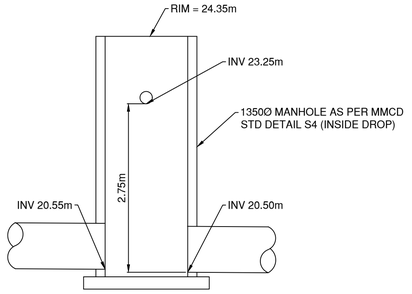
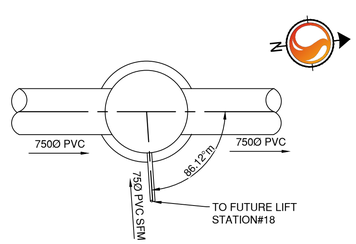


8 - SMH 22 - MARITIME HERITAGE MUSEUM
SCALE: NTS





9 - SMH 21 - FUTURE LIFT STATION #18 SANITARY FORCEMAIN
SCALE: NTS

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TITLE:
WATERFRONT SEWER SYSTEM UPGRADES
CIVIL DETAILS

DRAWING NO. 17-524- C202
PROJECT: 111720050
SHEET 10 OF 10
REV.