City of Coquitlam

Contract Documents
81832 - Phase 2

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

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Contract No. 81832 - Phase 2

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

Project Construction Documents

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Invitation to Tender

INVITATION TO TENDER

DATE OF ISSUE: **April 8, 2025**

We acknowledge with gratitude and respect that the name Coquitlam was derived from the hən̓q̓əmiń əm̓ word kʷikʷəƛ̓əm (kwee-kwuh-tlum) meaning "Red Fish Up the River". The City is honoured to be located on the kʷikʷəƛ̓əm (Kwikwetlem) traditional and ancestral lands, including those parts that were historically shared with the sḵəćiy̓aʔɬ təməxʷ (Katzie), and other Coast Salish Peoples.

Tender No. 81832 - Phase 2

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

The City of Coquitlam invites tenders for **Contract 81832 - Phase 2 - Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail**, generally consisting of the following, but not limited to:

- Partial removal of pre-load
- HDD installation of new sanitary sewer main from sanitary pump station to Gilleys Trail (HDPE pipe to be supplied by City)
- Construction of two sedimentation ponds
- Construction of concrete box culverts
- Water main, water services and other water works
- Construction of new road, driveways and MUP
- Environmental planting and other enhancements, irrigation system, ESC measures and installation of fence
- Maintaining access to all properties on Cedar Drive during all construction phases
- Other miscellaneous and incidental works as further described in the Contract Documents

Tender Documents and Drawings are available for downloading from the City of Coquitlam website: www.coquitlam.ca/BidOpportunities

Printing of Tender documents and drawings is the sole responsibility of the Tenderers.

Tenders submitted must be accompanied by a copy of the original specified 10% Bid Bond and will be received:

On or Before 2:00 pm local time
April 29, 2025
("Closing Date and Time")

Addenda

Tenderers are required to check the City's website for any updated information, issued before the Closing Date at: www.coquitlam.ca/BidOpportunities. **Where in its sole discretion it considers it to be necessary or desirable, the City may issue Addenda to amend any portion of the Contract Documents.**

Any changes to the Tender documentation will be issued by means of written Addenda and posted on the City's website and will form part of the Tender. No amendment of any kind to the Tender is effective unless it is posted in a formal written Addendum on the City website. Upon submitting a Tender, Tenderers will be deemed to have received notice of all Addenda that are posted on the City's website and deemed to have considered the information for inclusion in the Tender submitted.

The City does not retain a bidder's list or bidder's registry. Tenderers are encouraged to register as plan takers and may view the Tender Documents and Drawings by contacting the Vancouver Regional Construction Association (VRCA), website: www.my.vrca.ca, ph: 604-294-3766, or email at vrca@vrca.ca, quoting the Coquitlam Tender Reference Number.

Should there be any discrepancy in the documentation provided, the City's original file copy shall prevail.

Tenders shall remain open for acceptance for 60 days following the submission Closing Date.

The City reserves the right to accept or reject any or all Tenders and the lowest or any Tender may not necessarily be accepted. The City also reserves the right to cancel any request for Tender at any time without recourse by the Tenderer.

The City, prior to award of any Tender, may negotiate with the Tenderer presenting the lowest price compliant Tender, for changes in the Work, materials, specifications or conditions without having any duty or obligation to advise any other Tenderers or to allow

them to modify their Tenders, and the City will have no liability to any Tenderer as a result of such negotiations or modifications.

The City will not be responsible for any costs incurred by the Tenderer in preparing the Tender.

Procurement of goods and services is conducted in accordance with Chapter 5 of the Canadian Free Trade Agreement (CFTA) and the New West Partnership Trade Agreement (NWPTA).

M. Pain
Manager Procurement

Instructions to Tenderers

Tender 81832 - Phase 2

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

INSTRUCTIONS TO TENDERERS

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INSTRUCTIONS TO TENDERERS

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

The City of Coquitlam

Contract: **Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail**

Reference No. **81832 - Phase 2**

1.0 Introduction

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

- Partial removal of pre-load
- HDD installation of new sanitary sewer main from sanitary pump station to Gilleys Trail (HDPE pipe to be supplied by City)
- Construction of two sedimentation ponds
- Construction of concrete box culverts
- Water main, water services and other water works
- Construction of new road, driveways and MUP
- Environmental planting and other enhancements, irrigation system, ESC measures and installation of fence
- Maintaining access to all properties on Cedar Drive during all construction phases
- Other miscellaneous and incidental works as further described in the Contract Documents

1.2 All inquiries regarding this Tender are to be submitted in writing referencing the **Tender Name and Number** sent to:

E-mail **bid@coquitlam.ca**

The deadline for inquiries is **2:00 PM** local time, **Thursday, April 24, 2025.**

INQUIRIES RECEIVED AFTER THIS DATE AND TIME MAY NOT RECEIVE A RESPONSE.

2.0 Tender Documents

2.1 The Tender Documents which a Tenderer should review to prepare a Tender consist of all of the *Contract Documents* listed in Schedule 1 entitled “Schedule of Contract Documents”. Schedule 1 is attached to the Agreement which is included as part of the Tender Package. The *Contract Documents* include the drawings listed in Schedule 2 to the Agreement, entitled “**List of *Contract Drawings***”.

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

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

3.0 Submission of Tenders

3.1 Tenders must be submitted on the Tender Form provided, accompanied by a copy of the original 10% Bid Bond quoting the Tender Name and Number, and be uploaded to the City's file transfer website.

Tenders must be received on or before:

Tender Closing Time: **2:00 p.m. local time**
Tender Closing Date: **April 29, 2025**

For the purpose of the Tender submission, digital copies of original documents and signatures sent electronically are accepted. Original documents are required upon request by the City.

Instructions for Tender Submission

3.2 **Tender submissions are to be consolidated into one (1) PDF file and uploaded electronically through QFile, the City's file transfer service accessed at website:** http://qfile.coquitlam.ca/bid

1. **In the "Subject Field" enter: Tender Number and Name**
2. **Add consolidated Tender file in PDF format and Appendix 1 in XLS format, and Send** (ensure your web browser remains open until you receive 2 emails from

Qfile to confirm upload is complete and was sent to email: bid@coquitlam.ca)

Tenderers are responsible to allow for ample time to complete the submission process. For assistance, phone 604-927-3037.

3.3 Tenders submitted shall be deemed to be received when displayed as a new email in the in-box of the above email address. The City will not be responsible for any delay or for any Tenders not received for any reason, including technological delays or issues by either party's network or email program, and the City will not be liable for any damages associated with Tenders not received.

3.4 The City reserves the right to accept late Tenders to allow for technological delays. The City also reserves the right to accept Tenders by email: bid@coquitlam.ca.

BIDS RECEIVED IN-PERSON, BY COURIER, OR BY FAX WILL NOT BE ACCEPTED.

3.5 Tenders will not be opened in public. The unevaluated results will be forwarded to participants by email.

3.6 Tender submissions are subject to the Freedom of Information and Protection of Privacy Act and contents may be disclosed if required to do so, pursuant to the Act.

4.0 Additional Instructions to Tenderers

4.1 a) All instream work must be completed within Fisheries window (**Aug 1 to September 15, 2025**). Contractor must ensure that enough manpower and resources are allocated to complete the work within the Fisheries window. Refer to Supplementary General Conditions, Clause 13.9.2.

b) Contractor must refer to Appendix B (Traffic and Construction Staging Plan) for works to be carried out before August 1 and after August 1. Contractors can submit any improvements to these plans for review.

c) Contractors should submit their schedules clearly showing sequencing of works with dates. As part of Construction Schedule Contractor will prepare and submit a construction sequencing detail for execution of various work components in accordance with Appendix B – Traffic and Construction Staging Plan.

d) All plantings to be completed between October 01 and March 31, unless irrigation is available.

e) Non-Mandatory Site Meeting

A site meeting will be held on Cedar Drive as per following details:
Location: Near Cedar Drive Pump Station (4180 Cedar Dr.)

Date: Tuesday, April 15, 2025
Time: 10:00 AM
Tenderers are advised to attend this site-meeting as this will be an opportunity to familiarize with the site conditions and ask any site related questions.

Obtaining Documents 4.2 The following documents which are referred to and form part of the Contract Document package may be obtained as follows:

- Copies of the Master Municipal Construction Documents Volume II (2009), General Conditions, Specifications and Standard Detail Drawings are available separately from:

  Support Services Unlimited
  Suite 102
  211 Columbia Street
  Vancouver, B.C. V6A 2R5
  Tel: 604-681-0295
  Fax: 604-305-0424

- Copies of the City of Coquitlam Supplementary Specifications and Detailed Drawings to the MMCD 2009 Edition are available for viewing and downloading off the City of Coquitlam website: Supplementary Specifications and Detailed Drawings to MMCD

Test Excavations 4.3 Prior to the excavation of test holes on road allowances or privately owned property the Tenderer shall obtain permission from the Municipality or Owner of the property and comply with their requirements for restoration of disturbed surfaces and utilities. Failure to comply with Municipal by-laws restricting this practice may result in prosecution of the offending party.

Business License 4.4 The successful Tenderer shall provide evidence of a City of Coquitlam Business License or Tri-Cities Inter-Municipal Business License prior to commencement of work or supply of materials. For more information, contact Business License Division Ph: 604-927-3085 or apply online at website: City of Coquitlam Business License

No Claim 4.5 Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderer shall have any claim for any compensation of any kind whatsoever, as a result of participating in this Tender, including accepting a non-compliant bid and by submitting a Tender, each Tenderer shall be deemed to have agreed that it has no claim.

No Cost	4.6	The City will not under any circumstances be responsible for any costs incurred by the Tenderer in preparing the Tender.
Right to Accept or Reject any Tender	4.7	The City reserves the right to accept or reject any or all Tenders and the lowest or any Tender may not necessarily be accepted. In its sole discretion, the City may reject or retain for its consideration, tenders which are nonconforming because they do not contain the content or form required by the instructions to tenderers or for failure to comply with the process for submission set out in these instructions to tenderers. The City specifically reserves the right to reject all Tenders if none is considered to be satisfactory and, in that event, at its option, to call for additional Tenders.
Negotiation	4.8	The City, prior to award of any Tender, may negotiate with the Tenderer presenting the lowest price compliant Tender, for changes in the Work, materials, specifications or conditions without having any duty or obligation to advise any other Tenderers or to allow them to modify their Tenders, and the City will have no liability to any Tenderer as a result of such negotiations or modifications.
Cancellation of Tender	4.9	The City reserves the right to cancel any request for Tender at any time without recourse by the Tenderer. The City has the right to not award this work for any reason including choosing to complete the work with the City's own forces.
Conflict of Interest	4.10	Tenderers shall disclose any actual or potential conflicts of interest and existing business relationships it may have with the City, their elected or appointed officials or employees.
Collusion	4.11	Tenderers will not discuss or communicate with one another in regards to the preparation of their Tenders. Each Tenderer will ensure that its participation in the Tender process and that of its team members is conducted without collusion or fraud. Failure to comply with this requirement may lead to disqualification without further notice or warning.
Instruction to Tenderers – Part II	4.12	Delete Instructions to Tenderers – Part II Contained in the Edition of the Publication "Master Municipal Construction Documents 2009" and replace with the following:

5.0	**Tender Requirements**	5.1	A tender should be on the Form of Tender as provided and be signed by the authorized signatory(s) as follows: 5.1.1 if the tenderer is a partnership or joint venture then the name of the partnership or joint venturer should be included, and each partner or joint venturer should sign

personally; if a partner of joint venture is a corporation then such corporation should sign as indicated in paragraph 5.1.3 below; and

5.1.2 if the tenderer is a corporation then the full name of the corporation should be included, together with the names and signatures of authorized signatories.

5.1.3 For the purpose of the Tender submission, digital copies of original documents and electronic signatures are accepted. Original documents are required upon request by the City.

5.2 A tender must be accompanied by tender security ("*Bid Security")* in the form of:

5.2.1 a copy (digital or Electronic copy is acceptable) of the original bid bond in an amount equal to 10% of the Tender Price, issued by a surety licensed to carry on the business of suretyship in British Columbia in a form reasonably satisfactory to the *Owner*;

5.3 Tenderer should be competent and capable of performing the various items of work. Tenderer shall complete the following statement sheets appended to the Form of Tender:

5.3.1 Appendix 1 – the Schedule of Quantities and Prices;

5.3.2 Appendix 2 – a "*Preliminary Construction Schedule*", generally in the form attached as Appendix 2 to the Form of Tender, and showing *Substantial Performance* by the date or within the duration, shown in paragraph 2.2 of the Form of Tender.

5.3.3 Appendix 3 – name and brief description of the previous experience of the *Superintendent* the tenderer will use for the *Work*;

5.3.4 Appendix 4 – a list of previous comparable work, including a brief description of that work, approximate contract value, and references (with phone numbers);

5.3.5 Appendix 5 – a complete list of all subcontractors, if any, that the tenderer will use for the *Work* including full names.; and

5.3.6 Appendix 7 – is provided for information only, to indicate the Contract Insurance is to be

submitted by the successful Tenderer upon Notice of Award.

5.4 The successful tenderer will, within 15 *Days* of receipt of the written *Notice of Award*, be required to deliver to the *Owner* the items listed in FT 5.1.1, including a Performance Bond and a Labour and Material Payment Bond as described in FT 5.1.1(a), failing which the provisions of FT 6.1 will apply.

6.0 Qualifications, Modifications, Alternative Tenders

6.1 Tenders which contain qualifications, or omissions, so as to make comparison which other tenders difficult, may be rejected by the *Owner*.

6.2 A tenderer may, at the tenderer's election, submit an alternative tender ("*Alternative Tender*") which varies the materials, products, designs or equipment by the *Owner as Approved Equals* as the case may be, but an *Alternative Tender* must be in addition to, and not in substitution for a tender which conforms to the requirements of the *Contract Documents*.

6.3 The only *Alternative Tender* that the *Owner* may acc*ept* is an *Alternative Tender* submitted by that tenderer whose conforming tender, submitted as required by paragraph 6.2 of these Instructions to Tenderers, would have been accepted by the *Owners* in the preference to other conforming tenders, if no *Alternative Tenders* had been invited.

7.0 Approved Equals

7.1 Prior to the *Tender Closing Time and Date,* a tenderer may request the *Owner* to approve materials, products, or equipment ("*Approved Equal*") to be included in a tender in substitution for items indicated in the Contract Documents.

7.2 Applications for an *Approved Equal* must be in writing, and supported by appropriate supporting information, data, specifications, and documentation.

7.3 If the *Owner* decides in its discretion to accept an *Approved Equal*, then the *Owner* will issue an addendum to all tenderers.

7.4 The *Owner* is not obligated to review or accept an application for an *Approved Equal*.

8.0 Inspection of the *Place of the Work*

8.1 All tenderers, either personally or through a representative, are responsible to examine the *Place of the Work* before submitting a tender. A tenderer has full responsibility to be familiar with and make allowance in the tender for all conditions at the *Place of the Work* that might affect the tender, including any information regarding subsurface soil conditions made available by the *Owner*, the location of the

Work, local conditions, topographical soil conditions, weather and access. Unless otherwise specified in the *Contract Documents*, a tenderer is not required to do subsurface investigations. By submitting a tender, a tenderer represents that the tenderer has examined the *Place of the Work*, or specifically elected not to. No additional payments or time extensions shall be claimable or due because of difficulties relating to conditions at the *Place of the Work* which were reasonably foreseeable by a contractor qualified to undertake the *Work*.

8.2 Tenderers are referred to GC 11.2.1 regarding **Concealed or Unknown Conditions.**

9.0 Interpretation of *Contract Documents*

9.1 If a tenderer is in doubt as to the correct meaning of any provision of the *Contract Documents*, the tenderer may request clarification as instructed in paragraph 1.2 of the Instructions to Tenderers.

9.2 If a tenderer discovers any contradictions or inconsistencies in the *Contract Documents* or its provisions, or any discrepancies between a provision of the *Contract Documents* and conditions at the *Place of the Work as* observed in an examination under paragraph 8 of the person named in paragraph 1.2 of the Instructions to Tenderers.

9.3 If the *Owner* considers it necessary, the *Owner* may issue written addenda to provide clarification (s) of the *Contract Documents.*

9.4 No oral interpretation or representations from the *Owner* or any representative of the *Owner* will affect, alter, or amend any provision of the *Contract Documents*.

10.0 Prices

10.1 The Tendered Price will represent the entire cost excluding *GST* to the *Owner* of the complete *Work* based on the estimated quantities in the *Schedule of Quantities and Prices* of the Form of Tender. Notwithstanding the generalities of the above, tenderers shall include in the tendered prices (including unit prices, lump sum prices, or other forms of pricing) sufficient amounts to cover:

10.1.1 the costs of all labour, equipment and material included in or required for the *Work*, including all items which, whole not specifically listed in the *Schedule of Quantities and Prices*, are included in the *Work* specifically or by necessary inference from the *Contract Documents;*

10.1.2 all assessments payable with respect to labour as required by any statutory scheme such as unemployment insurance, holiday pay,

insurance, CPP and all employee benefits and the Workers Compensation Act;

10.1.3 all overhead costs, including head office and on-site overhead costs, and all amounts for the *Contractor's* profit.

10.2 The tendered prices and all subcontracts must allow for compliance with all applicable laws regarding trade or other qualifications of employees performing the *Work*, and payment of appropriate wages for labour included in or required for the *Work*.

11.0 Taxes

11.1 The tendered prices shall cover all taxes and assessments of any kind payable with respect to the *Work*, but shall not include *GST*. *GST* shall be listed as a separate line item as required by GC 19.3.

12.0 Amendment of Tenders

12.1 A tenderer may amend or revoke a tender by giving written notice, delivered by Email, to the office referred to in paragraph 3.4 of the Instructions to Tenderers at any time up until the *Tender Closing Date and Time*. An amendment or revocation that is received after the *Tender Closing Date and Time* shall not be considered and shall not affect a tender as submitted.

12.2 An amendment or revocation must be signed by an authorized signatory of the tenderer in the same manner as provided by paragraph 5.1 of these Instructions to Tenderers.

12.3 Any amendment that expressly or by inference discloses the tenderer's *Tender Price* or other material element of the tender such that, in the opinion of the *Owner*, the confidentiality of the tender is breached, will invalidate the entire tender.

12.4 An acceptable form of a tender amendment which tenderers may, but are not required to, use is as follows:

"Contract: _____
(TITLE OF CONTRACT)

Reference No. _____
(OWNER'S CONTRACT REFERENCE NO.)

TO: _____
(NAME OF OWNER)

We the undersigned wish to amend our tender which we submitted for the above *Contract* by deleting the following tendered prices or items from our tender:

_____
_____
_____
(TEDNERED PRICES AND/OR TENDER ITEMS IN THE TENDER THAT ARE TO BE AMENDED)

and substituting the following revised tendered prices or items:

_____
_____
_____
(REVISED TENDERED PRICES OR TENDER ITEMS)

The extensions in our tender should be adjusted accordingly, and our ***Tender Price*** as set out in Appendix 1 of our submitted **Form of Tender**, and on the ***Schedule of Quantities and Prices***, increased / decreased by $_____, excluding GST. We have not included our revised ***Tender Price*** in order to preserve the confidentiality of our tender.

Signed and delivered the ___ day of _____, 20___."

13.0 Duration of Tenders

13.1 After the *Tender Closing Time*, a tender shall remain valid and irrevocable as set out in paragraph 5.1 of the Form of Tender.

14.0 Qualifications of Tenderers

14.1 By submitting a tender, a tenderer is representing that it has the competence, qualifications and relevant experience required to do the *Work.*

15.0 Award

15.1 In exercising its discretion, the *Owner* will have regard to the information provided in the Appendices to the Form of Tender as described under IT 5.3 including the proven experience of the tenderer, and any listed subcontractors, to do the *Work*.

Tenders received will be evaluated to provide the City with greatest value based on quality, service, price and experience. Evaluation Criteria will include but is not limited to:

1. Ability to meet specifications and required completion date
2. Contractor's past experience, references, reputation and compliance to specifications
3. Demonstrated successful experience on similar projects and specific equipment installation
4. Price: purchase price, maintenance costs, availability of parts and service, warranty and compatibility with existing equipment and/or conditions
5. Any other criteria, the City deems, at its sole discretion, necessary to evaluate Tenders;
6. Lowest price will not necessarily be accepted.

The City may, in its absolute discretion, not award to a Tenderer if the Tenderer, or any officer or director of a corporate Tenderer, is or has been engaged, either directly or indirectly through another corporation or legal entity, in a legal action against the City and its elected and appointed officers and employees or any of them in relation to:

a) any other contract or services; or

b) any matter arising from the City's exercise of its powers, duties or functions under the *Local Government Act,* the *Community Charter* or any other enactments; within five years of this Tender Offer.

For purposes of this section, the words "legal action" includes, without limitation, mediation, arbitration, hearing before an administrative tribunal or lawsuit filed in any court.

Without limiting the City's sole discretion, in determining whether or not to award to a Tenderer pursuant to this clause, the City will consider such factors as whether the legal action is likely to affect the Tenderer's ability to work with the City and its employees, agents, consultants and representatives or any of them and whether the City's past experience with the Tenderer in the matter that resulted in the legal action indicates that the City is likely to incur increased staff and legal costs or either of them in the administration of this contract if it is awarded to the Tenderer.

In the event that the lowest total Tender Price by two or more Tenderers is the same amount, the City will select a Tenderer with an overall satisfactory performance record in having completed work on previous relevant projects that are provided as references, and on City projects. Information obtained from references will not be disclosed or discussed with any Tenderer. If all references are equal, selection will be determined by a coin toss in a manner to be directed by the City.

Where only one Tender is received the City may reject such and re-tender on a selected basis.

15.2 The *Owner* will notify the successful tenderer in writing.

15.3 If there are any discrepancies in the *Schedule of Quantities and Prices* between the unit prices and the extended totals then the unit prices shall be deemed correct, and corresponding corrections shall be made to the extended totals. If a unit price or extended total has been omitted, the following shall apply:

a) If a unit price is given but the corresponding extended total has been omitted, then the extended total shall be calculated from unit price and the estimated quantity, and inserted as the extended total;

b) If an extended total is given but the corresponding unit price has been omitted, then the unit price shall be calculated from the extended total and estimated quantity, and inserted as the unit price;

c) If both the unit price and the corresponding extended total for a tender item have been omitted, then the following test shall be applied to determine whether the tender shall be rejected as incomplete:

(i) the highest of the unit prices tendered by other tenderers for that tender item shall be used as the test unit price, and the corresponding test extended total shall be calculated from the test unit price and the estimated quantity;

(ii) if the test extended total for the tender item exceeds 1% of the revised total *Tender Price*, including the test extended total, or if the revised total *Tender Price*, including the test extended total, alters the ranking of the tenderers according to the lowest *Tender Price*, then the omitted unit price for that tender item is deemed to materially

affect the *Tender Price* relative to other tenders and the tender shall be rejected;

(iii) if the tender is not rejected under subparagraph (ii) of this IT 15.3 (c), then the unit price and the extended total for that tender item shall both be deemed to be, and the costs for that tender item shall be zero deemed to be included in other tender items prices;

d) In no event shall page totals in the *Schedule of Quantities and Prices* or the total *Tender Price* be used to calculate missing extended totals or unit prices.

16.0 Subcontractors

16.1 The *Owner* reserves the right to object to any of the subcontractors listed in a tender. If the *Owner* objects to any of the subcontractor(s) then the *Owner* will permit a tenderer to, within 5 days, propose a substitute subcontractor(s) acceptable to the *Owner* provided that there is not resulting adjustment in the *Tender Price* or the completion date set out in paragraph 2.2 of the Form of Tender. A tenderer will not be required to make such substitution and, if the *Owner* objects to a listed *Subcontractor(s)*, the tenderer may, rather than propose a substitute subcontractor(s), consider its tender rejected by the *Owner* and by written notice withdraw it tender. The *Owner* shall, in the event, return the tenderer's bid security

17.0 Optional Work

17.1 If the *Schedule of Quantities and Prices* includes any tender prices for *Optional or Provisional Work*, as defined in GC 7.4.1, the tenderers must complete all the unit prices for such *Optional or Provisional Work*. Such tender prices shall not include any general overhead costs, or other costs, or profit, not directly related to the *Optional or Provisional Work*.

17.2 Notwithstanding that the *Owner* may elect not to proceed with the *Optional or Provisional Work*, the tender prices for any *Optional or Provisional Work*, including the extended totals for *Optional or Provisional Work* unit prices, shall be included in the *Tender Price* for the purpose of any price comparisons between tenders.

Form of Tender

Form of Tender

Tender No. 81832 – Phase 2

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

Summary

Name of ***Contractor***: _____

Tender Price (exclude GST): $ _____
(FROM APPENDIX 1 OF FORM OF TENDER)

Tender submitted must be accompanied by a copy of the original 10% Bid Bond and will be received

On or before 2:00 pm (local time)
Tuesday, April 29, 2025

Instructions for Tender Submission

Tender submissions are to be consolidated into one (1) .pdf file and **uploaded electronically through QFile, the City's file transfer service accessed at website:** qfile.coquitlam.ca/bid

1. **In the "Subject Field" enter:** Tender Number and Name
2. **Add consolidated Tender file in PDF format, and Appendix 1 in XLS format, and Send** (ensure your web browser remains open until you receive 2 emails from Qfile to confirm upload is complete and was sent to the correct email address: bid@coquitlam.ca)

Tenderers are responsible to allow ample time to complete the Tender submission process. If assistance is required, phone 604-927-3037.

THE CITY OF COQUITLAM
3000 Guildford Way
Coquitlam, B.C. V3B 7N2

April 2025

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

Contract Name: **Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail**
Reference No.: **81832 – Phase 2**

TO OWNER:

1 WE, THE UNDERSIGNED:

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

_____
_____
_____;
(ADDENDA, IF ANY)

1.2 shall fully disclose any actual or potential conflicts of interest and existing business relationships we may have with the City, their elected or appointed officials or employees:

_____

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

1.4 have complied with the Instructions to Tenderers; and

2 ACCORDINGLY WE HEREBY OFFER:

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

2.2 to achieve *Substantial Performance* of the *Work* on or before **April 30, 2026**; 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 unit prices set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices*, and excludes *GST.*

3 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.

3.2 that we understand and agree that the owner is in no way obliged to accept this Tender.

4 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.

4.1.3 the Certificate of Compliance on the form provided in Appendix 7 of this Form of Tender.

5 WE AGREE:

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

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

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*;

b) a "clearance letter" indicating that the Tenderer is in WCB compliance; and

c) a copy of the insurance policies as specified in SGC Section 24 indicating that all such insurance coverage is in place and;

d) a letter confirming the *Contractor* as “Prime Contractor” for the Contract as specified in SGC Section 21.2.1.

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

5.1.3 sign the Contract Documents as required by GC 2.1.

6 WE AGREE:

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

6.1.1 fail or refuse to deliver the documents as specified by paragraph 5.1.1 of this Form of Tender; or

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

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

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

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

7 OUR ADDRESS is as follows:

_____

_____

_____

Phone: _____ - _____ - _____

Email: _____

Attention: _____

This Tender is executed this_____day of_____, 20_____.

Contractor:

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

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

8 WE CONFIRM:

8.1 our Goods and Services Tax (GST) registration status is as follows:

8.1.1 for information purposes, our GST Registration Number is:

_____
(GST REGISTRATION NUMBER)

or;

8.1.2 by signature hereunder, we certify we are **not required** to provide a registration number:

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

APPENDIX 1
FORM OF TENDER

Contract 81832 - Phase 2
CEDAR DRIVE UPGRADES - SANITARY PUMP STATION TO GILLEYS TRAIL

SCHEDULE OF QUANTITIES AND PRICES

(see paragraph 5.3.1 of the Instruction to Tenderers)

(All Tender and Contract Prices shall NOT include GST. GST will apply upon payment)

(Should there be any discrepancy in the information provided, the City's original file copy shall prevail)

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
1.0	**01 53 01S**	**TEMPORARY FACILITIES**				
1.01	(1.9.2)	Ground Water Management and Dewatering of all site	Lump Sum	1		$ -
1.02	(1.9.3)	Partington Creek Bypass as per Environmental Management Plan (EMP) - Appendix C and ESC Plan (Contract Drawings)	Lump Sum	1		$ -
1.03	(1.9.4)	Steel Sheet Piling along Upper Concrete Box Culverts	Square Meter	34		$ -
2.0	**01 55 00S**	**TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING**				
2.01	1.5.1	Traffic Control and Management		Incidental to Contract		
3.0	**01 57 01S**	**ENVIRONMENTAL PROTECTION**				
3.01	(1.6.1)	ESC supply & installation, maintenance and removal	ALLOWANCE			$ 120,000
4.0	**01 58 01S**	**PROJECT IDENTIFICATION**				
4.01	(1.3.1)	Construction Zone Information Signs	Each	4		$ -
5.0	**03 30 20S**	**CONCRETE WALKS, CURBS AND GUTTERS**				
5.01	(1.4.3)	MMCD C4 Curb and Gutter (Solid or slotted)	lin.m	1827		$ -
5.02	(1.4.5)	Concrete Pedestrian Letdowns	Square Meter	48		$ -
5.03	(1.4.5)	Concrete Driveway Letdowns and Aprons	Square Meter	95		$ -
5.04	(1.4.10)	Tactile Strip - 0.6m x 3.5mAccess Tile, Truncated Dome Pattern, Yellow color - Cast-in-place (removable)	Each	3		$ -
6.0	**03 40 01S**	**PRECAST CONCRETE**				
6.01	(1.4.3)	Concrete Lock Block Retaining Wall (Behind Fire Hydrants)	Square Meter	51		$ -
7.0	**04 43 00S**	**CHANNEL SUBSTRATE**				
7.01	(1.3.1)	Channel Substrate Gravel Mix	Cubic Meter	850		$ -
7.02	(1.3.2)	600mm Dia. Boulder	Each	50		$ -
8.0	**26 56 01**	**ROADWAY LIGHTING**				
8.01	1.9.1	Street and MUP Lighting	Lump Sum	1		$ -
9.0	**31 11 01S**	**CLEARING AND GRUBBING**				
9.01	(1.4.1)	Tree and Shrub Removals, Clearing and Grubbing	Lump Sum	1		$ -
10.0	**31 23 01S**	**EXCAVATING, TRENCHING AND BACKFILLING**				

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
10.01	(1.10.9)	Imported Trench Backfill (75mm Minus) (Provisional)	Tonnes	800		$ -
11.0	**31 23 23S**	**CONTROLLED DENSITY FILL**				
11.01	1.4	Infill of Existing 1200mm Dia. HDPE Culvert with Controlled Density Fill (CEMATRIX or Approved Equal)	Cubic Meter	110		$ -
12.0	**31 24 13S**	**ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION**				
12.01	(1.8.5)	Common Excavation - Off Site Disposal, includes stripping and top soil removal (Provisional)	Cubic Meter	23000		$ -
12.02	(1.8.5)	Common Excavation - Off Site Disposal to local sites (NE Coquitlam), includes stripping and top soil removal (Provisional)	Cubic Meter	23000		$ -
12.03	(1.8.5)	Common Excavation - Onsite reuse	Cubic Meter	2000		$ -
12.04	(1.8.5)	Japanese Knotweed Removal and Off Site Disposal (Provisional)	Square Meter	750		$ -
12.05	(1.8.5)	Japanese Knotweed Removal and Off Site Disposal (Provisional)	Square Meter	750		$ -
12.06	(1.8.10)	Overexcavation, Offsite Disposal, Backfilling (includes top soil stripping)	Cubic Meter	500		$ -
12.07	(1.8.15)	Japanese Knotweed Removal and Off Site Disposal to 1341 Gilleys Trail (Provisional)	Square Meter	750		$ -
12.08	(1.8.16)	Regrading of embankment slope below tree line after removal of sloughed top soil. Work to be done from the embankment top so as not to disturb Coho Gravel.	Square Meter	1100		$ -
12.09	(1.8.5)	Off site disposal of previously stockpiled soil on 1341 Gilleys Trail (Provisional)	Cubic Meter	450		$ -
12.10	(1.8.4)	Relocating the existing lock blocks placed on 1341 Gilleys Trail, after rough grading the ground (Provisional)	each	100		$ -
12.11	(1.8.14)	Light Weight Fill Material - Pumice Aggregate	Cubic Meter	1300		$ -
13.0	**32 11 16.1S**	**GRANULAR SUBBASE**				
13.01	(1.4.3)	75mm Clear Crushed Gravel	Tonne	700		$ -
13.02	(1.4.3)	75mm Minus Crushed Granular Sub Base - Road	Tonne	5380		$ -
13.03	(1.4.3)	75mm Minus Crushed Granular Sub Base - Driveways (PROVISIONAL)	Tonne	360		$ -
14.0	**32 11 23S**	**GRANULAR BASE**				
14.01	(1.4.3)	19mm Minus Crushed Granular Base, variable thickness, for roadway and as shown on Contract Drawings	Tonne	5400		$ -
15.0	**32 12 13.1S**	**ASPHALT TACK COAT**				
15.01	(1.5.1)	Asphalt Tack Coat	Square Meter	8050		$ -
16.0	**32 12 16S**	**HOT-MIX ASPHALT CONCRETE PAVING**				
16.01	(1.5.1)	Machine Laid Hot Mix Asphalt 50mm (MMCD Uppercourse #1)	Tonne	990		$ -
16.02	(1.5.1)	Machine Laid Hot Mix Asphalt 50mm (MMCD Lower Course #1)	Tonne	990		$ -

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
16.03	(1.5.1)	Machine Laid Hot Mix Asphalt (Driveways/Letdowns) (MMCD Upper Course #2)	Tonne	450		$ -
17.0	**32 17 23S**	**PAINTED PAVEMENT MARKINGS**				
17.01	(1.5.3)	Permanent Thermoplastic Pavement Markings	Lump Sum	1		$ -
17.02	(1.5.4)	Supply & Install of Traffic Signage - City to supply all new sign tabs	Lump Sum	1		$ -
18.0	**32 31 13S**	**CHAIN LINK FENCES AND GATES**				
18.01	1.5.1	Chain Link Fence (1.8m High)	lin.m	682		$ -
18.02	1.5.2	Chain Link Gate (1.8M High) - 4300 Oliver Road	lin.m	11		$ -
18.03	1.5.2	Chain Link Gate (1.8M High) - North Pond	lin.m	6		$ -
18.04	1.5.3	Relocation of Existing Chain Link Gates (4170 and 4182 Cedar Drive)	Each	2		$ -
18.05	(1.5.5)	Single Rail Trail Fence (as per COQ-L5A)	lin.m	768		$ -
19.0	**32 84 23S**	**IRRIGATION SYSTEM**				
19.01	(1.11)	Providing and Installing irrigation system complete with double check valve assembly (Watt 007QT), irrigation controller, Rainbird PEB valves, all labor, equipment and materials needed to complete the work as shown on Contract Drawings including maintenance for one year as described in specifications.	Lump Sum	1		$ -
20.0	**32 91 21S**	**TOP SOIL AND FINSIH GRADING**				
20.01	(1.4.1)	Topsoil (Sodding and Hydroseed Areas)	Cubic Meter	370		$ -
20.02	(1.4.1)	Growing Mediums specified on Contract Drawings	Cubic Meter	8300		$ -
21.0	**32 92 19S**	**HYDRAULIC SEEDING**				
21.01	(1.8)	Hydroseed (Provisional)	Square Meter	310		$ -
22.0	**32 92 23S**	**SODDING**				
22.01	(1.8.1)	Sodding	Square Meter	1900		$ -
23.0	**32 93 01S**	**PLANTING OF TREES, SHRUBS, AND GROUND COVERS**				
23.01	(1.9.1)	Tree - Amelanchier canadenis - Canada Serviceberry	Each	14		$ -
23.02	(1.9.1)	Tree - Betula allenghaniensis - Yellow Birch	Each	32		$ -
23.03	(1.9.1)	Tree - Cercis canadiensis - Eastern Redbud	Each	6		$ -
23.04	(1.9.1)	Tree - Crataegus douglasii suksdorfii - Black Hawthorn	Each	4		$ -
23.05	(1.9.1)	Tree - Gleditsia triacanthus - Honey Locust	Each	7		$ -
23.06	(1.9.1)	Tree - Picea glauca - White Spruce	Each	6		$ -
23.07	(1.9.1)	Tree - Pinus contorta - Shore Pine	Each	14		$ -
23.08	(1.9.1)	Tree - Pinus ponderosa - Ponderosa Pine	Each	13		$ -
23.09	(1.9.1)	Tree - Prunus emarinata - Bitter Cherry	Each	20		$ -
23.10	(1.9.1)	Tree - Pseudotsuga menziesii - Douglas Fir	Each	16		$ -

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
23.11	(1.9.1)	Tree - Quercus garryana - Garry Oak	Each	6		$ -
23.12	(1.9.1)	Shrubs	Each	7636		$ -
23.13	(1.9.1)	Ground Cover	Each	3369		$ -
23.14	(1.9.3)	Large Woody Debris	Each	36		$ -
23.15	(1.9.3)	Tree Snag	Each	12		$ -
23.16	(1.9.3)	Bat Box	Each	16		$ -
24.0	**33 05 25S**	**HORIZONTAL DIRECTIONAL DRILLING**				
24.01	(3.1)	450mm (18") DR11 HDPE Sanitary Main c/w Temporary Cap - Grey Pipe (HDPE Pipe to be supplied by the City; excluding fittings)	Linear Meter	474		$ -
25.0	**33 11 01S**	**WATERWORKS**				
25.01	(1.8.2)	200mm DI CL50 Water Main (V-Bio Encased) TR Flex or Tyton c/w Approved Joint restraints; Approved Native Backfill	Linear Meter	973		$ -
25.02	(1.8.2)	Steel Casing 450Ø SCH40 c/w RACI SPACERS as shown on Contract Drawings	Linear Meter	9		$ -
25.03	(1.8.3)	200 x 200 x 200 Tee	Each	3		$ -
25.04	(1.8.3)	200 x 200 x 150 Tee	Each	7		$ -
25.05	(1.8.3)	200mm 45 Degree DI Elbow	Each	3		$ -
25.06	(1.8.3)	200mm 22.5 Degree DI Elbow	Each	2		$ -
25.07	(1.8.3)	200mm Gate Valve	Each	13		$ -
25.08	(1.8.3)	150mm Gate Valve	Each	7		$ -
25.09	(1.8.4)	25mm Water Service Connection (as per COQ-W2b-2)	Each	1		$ -
25.10	(1.8.4)	50mm Water Service Connection to #4170 (as per COQ-W2e). Existing water service to be removed and capped as per COQ - W2h.	Each	1		$ -
25.11	(1.8.4)	Transfer 50mm Water Service Connection to #4182 (as per COQ-W2e)	Each	1		$ -
25.12	(1.8.4)	Transfer 50mm Water Service Connection to Pump Station (as per COQ-W2e)	Each	1		$ -
25.13	(1.8.4)	25mm Water Service Connection to #4180 (as per COQ-W2b-2). Existing water service to be removed and capped as per COQ - W2g.	Each	1		$ -
25.14	(1.8.4)	50mm Water Service Connection to #4196 (as per COQ-W2e)	Each	1		$ -
25.15	(1.8.4)	25mm Water Service Connection to #4265 (as per COQ-W2b-2)	Each	1		$ -
25.16	(1.8.5)	Air Release Valve (as per COQ-W6)	Each	5		$ -
25.17	(1.8.7)	Blow-off Assembly (as per COQ-W8)	Each	1		$ -
25.18	(1.8.15)	Fire Hydrant Assembly Terminal City C71P c/w Storz (Complete as per MMCD W4)	Each	7		$ -
25.19	(1.8.13)	Existing 200mm Watermain Tie-In	Each	4		$ -

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
25.20	(1.8.14)	Irrigation 50mm water service connection and meter - COQ-W2e, WM-3 and as shown in Contract Drawings & Appendix B	ea.	1		$ -
26.0	**33 30 01S**	**SANITARY**				
26.01	(1.6.2)	375mm SDR35 PVC Sanitary Main; Approved Native Backfill	Linear Meter	410		$ -
26.02	(1.6.2)	200mm SDR35 PVC Sanitary Main; Approved Native Backfill	Linear Meter	12		$ -
26.03	(1.6.2)	375mm Dia. Temporary Cap	Each	2		$ -
26.04	(1.6.2)	200mm Dia. Temporary Cap	Each	1		$ -
26.05	(1.6.3)	New 100mm Dia. Sanitary Service Connection to #4265 (as per MMCD S7)	Each	1		$ -
26.06	(1.6.7)	Existing 375mm Sanitary Main Tie-In	Each	1		$ -
27.0	**33 42 13S**	**PIPE CULVERTS**				
27.01	(1.5.2)	600mm Conc. Culvert (Creek Bypass)	Linear Meter	100		$ -
27.02	(1.5.2)	300mm Conc. Culvert	Linear Meter	20		$ -
27.03	(1.5.2)	1.2mx2.1m CONC. Box Culvert (c/w Weir and Coho Gravel As Shown on Contract Drawings)	Linear Meter	72		$ -
27.04	(1.5.2)	0.9mx2.1m CONC. Box Culvert (c/w Weir and Coho Gravel As Shown on Contract Drawings)	Linear Meter	36		$ -
27.05	(1.5.2)	250mm SDR28 PVC Culvert	Linear Meter	33		$ -
27.06	(1.5.2)	200mm SDR28 PVC Culvert	Linear Meter	37		$ -
27.07	(1.5.2)	200mm Dia. Flap Gate	Each	1		$ -
27.08	(1.5.8)	Fabricate and install Trash Racks for existing 1200mm HDPE Overflow Risers (StormRax - Round - 60inches or equivalent)	Each	2		$ -
28.0	**33 44 01S**	**MANHOLES AND CATCHBASINS**				
28.01	(1.5.1.1)	1050mm Concrete Sanitary Pre-benched Manhole Base c/w Slab, Frame and Cover	Each	7		$ -
28.02	(1.5.1.2)	1050mm Sanitary Manhole Risers	Vert. Meter	28		$ -
28.03	(1.5.7)	1050mm Concrete Sanitary Overbuild Manhole Base c/w Benching, Slab, Frame and Cover	Each	2		$ -
28.04	(1.5.3.2)	Water Valve Box Replacement - Terminal City Nelson Type as Directed by CA (Provisional)	Each	3		$ -

Total Tendered Price (exclude GST): $ -

(Transfer the amount to Form of Tender Summary Page 1)

Name of **Contractor:**

APPENDIX 2

FORM OF TENDER

Contract 81832 – Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

PRELIMINARY CONSTRUCTION SCHEDULE
(See paragraph 5.3.2 of the Instructions to Tenderers)

INDICATE SCHEDULE WITH BAR CHART WITH CONSTRUCTION DURATIONS

CONSTRUCTION ACTIVITY	2025														2026							
	MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		JAN		FEB		MAR		APR	

Substantial Completion Date: **April 30, 2026**

Note: All instream works to be completed within the Fisheries Construction Work Window from August 01 to September 30 as required under Fisheries Act Authorization

Proposed Disposal Site: _____

Proposed Disposal Site for knotweed infested soil: _____

APPENDIX 3

FORM OF TENDER

Contract 81832 - Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

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

Proposed Project Superintendent _____

List of Project Experience

PROJECT:		**Dates:**	
Work Description:			
Responsibility:			
Owner/Reference:		**Phone No.:**	

PROJECT:		**Dates:**	
Work Description:			
Responsibility:			
Owner/Reference:		**Phone No.:**	

PROJECT:		**Dates:**	
Work Description:			
Responsibility:			
Owner/Reference:		**Phone No.:**	

APPENDIX 4

FORM OF TENDER

Contract 81832 - Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

CONTRACTOR'S COMPARABLE WORK EXPERIENCE
(See paragraph 5.3.4 of the Instructions to Tenderers)

PROJECT:		**VALUE ($):**	
OWNER:		**Phone No.:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone No.:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone No.:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone No.:**	
Work Description:			

APPENDIX 5

FORM OF TENDER

Contract 81832 - Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

SUBCONTRACTORS
(See paragraph 5.3.5 of the Instructions to Tenderers)

Trade:		**Tender Item:**	
Work Description:			
Subcontractor:		**Phone No.:**	

Trade:		**Tender Item:**	
Work Description:			
Subcontractor:		**Phone No.:**	

Trade:		**Tender Item:**	
Work Description:			
Subcontractor:		**Phone No.:**	

Trade:		**Tender Item:**	
Work Description:			
Subcontractor:		**Phone No.:**	

Trade:		**Tender Item:**	
Work Description:			
Subcontractor:		**Phone No:**	

APPENDIX 6

FORM OF TENDER

Contract 81832 - Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

Bid Bond

NO. _____ $ _____

KNOW ALL MEN BY THESE PRESENTS THAT

_____
As Principal, hereinafter called the Principal, and

_____
As Surety, hereinafter called the Surety, are held and firmly bound unto

_____
As Obligee, hereinafter called the Obligee, in the amount of

_____ Dollars ($_____) lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a written Tender to the Obligee, dated the _____day of _____, 2025, for Contract _____.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal shall have the Tender accepted within sixty (60) days from the Closing Date of Tender and the said Principal will, within the time required, enter into a formal contract and give good and sufficient bonds to secure the performance of the terms and conditions of the Contract, then this obligation shall be null and void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of six (6) months from the date of this Bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its Attorney-In-Fact, this _____ day of _____, 2025.

SIGNED, SEALED AND DELIVERED
In the presence of:

)
)
)
)
_____)

_____
PRINCIPAL

_____
SURETY

APPENDIX 7

FORM OF TENDER

Contract 81832 - Phase 2
Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

CERTIFICATE OF COMPLIANCE for CONTRACT INSURANCE

This is provided for information to certify that the Tenderer does hereby undertake and agree to supply to the City of Coquitlam, upon award, contract insurance listed below for the project requirements indicated:

Contract Number: **81832 - Phase 2**

Contract Name: **Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail**

Description of Work:

- Partial removal of pre-load
- HDD installation of new sanitary sewer main from sanitary pump station to Gilleys Trail (HDPE pipe to be supplied by City)
- Construction of two sedimentation ponds
- Construction of concrete box culverts
- Water main, water services and other water works
- Construction of new road, driveways and MUP
- Environmental planting and other enhancements, irrigation system, ESC measures and installation of fence
- Maintaining access to all properties on Cedar Drive during all construction phases
- Other miscellaneous and incidental works as further described in the Contract Documents

Commercial General Liability: **$5,000,000 limit**

Special Coverage Required:

YES	NO	Special Coverage Description
( )	(X)	Shoring and Underpinning Hazard
( )	(X)	Pile Driving and Vibrations
(X)	( )	Excavation Hazard
( )	(X)	Demolition
( )	(X)	Blasting

We also certify that the insurance coverage will meet the requirements of the Supplementary General Conditions Section 24 – Insurance, included as part of the Contract Documents, and that the proof of insurance will be provided on the City of Coquitlam Certificate of Insurance form, without amendments, except for the exclusions noted above.

_____ _____

Name of Tenderer (printed) *Authorized Signature*

_____

Date

Agreement

AGREEMENT

Between Owner and Contractor

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

THIS AGREEMENT made in duplicate this ____ day of _____ 2025.

Contract: **Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail**

***Reference No*. 81832 - Phase 2**

BETWEEN:

The City of Coquitlam
3000 Guildford Way
Coquitlam, B.C. V3B 7N2

(the "*Owner*")

AND:

(the "*Contractor*")

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

1 THE WORK - START/COMPLETION DATES

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

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

1.3 Time shall be the essence of the Contract.

2 CONTRACT DOCUMENTS

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

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

3 CONTRACT PRICE

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

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

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

c) 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*.

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.

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*.

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 email, or by hand, or by pre-paid registered mail to the addresses as set out below:

The *Owner:*

The City of Coquitlam
3000 Guildford Way
Coquitlam, B.C. V3B 7N2

Tel: 604-927-3500

The *Contractor:*

Tel:
Email:
Attention:

The *Contract Administrator*:

The City of Coquitlam
3000 Guildford Way
Coquitlam, B.C. V3B 7N2

Tel:
Email:
Attention:

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

a) immediately upon delivery, if delivered by hand; or
b) immediately upon transmission if sent or received by email; or
c) 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*.

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 enure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns

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

Contractor:

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

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY AND POSITION - PRINT)

Owner:

The City of Coquitlam

_____
(MANAGER, CAPITAL PROJECTS AND INSPECTIONS)
Representative as Per G.C. 17

_____
(SENIOR MANAGER, DESIGN AND CONSTRUCTION)

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

Reference No: 81832 – Phase 2

Schedule 1

Schedule of Contract Documents

(INCLUDE IN LIST ALL DOCUMENTS INCLUDING, IF ANY, SUPPLEMENTARY GENERAL CONDITIONS, SUPPLEMENTARY SPECIFICATIONS, SUPPLEMENTARY STANDARD DETAIL DRAWINGS)

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

NOTE: The documents noted with "*" are contained in the "Master Municipal Construction Documents – General Conditions, Specifications and Standard Detail Drawings", edition dated 2009. All sections of this publication are included in the *Contract Documents*.

1. Agreement, including all Schedules;
2. The following Addenda:
    - As issued
3. Supplementary General Conditions, if any;
4. General Conditions*;
5. Supplementary Specifications, if any;
6. Detail Specifications, if any;
7. Specifications*;
8. Supplementary Detail Drawings, if any;
9. Standard Detail Drawings*;
10. Executed Form of Tender, including all Appendices;
11. Drawings listed in Schedule 2 to the Agreement –"List of Drawings", if any;
12. Instructions to Tenderers;
13. COQUITLAM "Supplementary Specifications Master Municipal Construction Documents" March 2022

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

Reference No: 81832 – Phase 2

Schedule 2

LIST OF DRAWINGS

(Complete Listing of All Drawings, Plans and Sketches That Are Part of the Contract Documents)

Bound in this Document:

Appendix A: Traffic Management Detail Specifications

Appendix B: Traffic and Construction Staging Plan

Appendix C: Environmental Management Plan (including Environmental Approvals and Authorizations)

Appendix D: Archaeological Chance Find Procedures

Appendix E: Geotechnical Investigation Report

Appendix F: Knotweed Management Plan – Partington Creek and Cedar Drive –Coquitlam, BC

Appendix G: Water Meter Specifications

Appendix H: Standard Detail Drawings & Park Development Standards

Appendix I: As-Built Drawings

Appendix J: Phase 1 (2024 Construction) Irrigation System Design Drawings

Appendix K: IFC Drawings for Phase 1 Works (2024 Construction)

Bound Separately: Contract Drawings

TITLE	CONSULTANT	SHEET NO.	REVISION NO.	DATE
COVER – CEDAR DRIVE UPGRADES – PHASE 2	ISL	00		
GENERAL NOTES	ISL	01	D	2025/04/03
KEY PLAN	ISL	02	D	2025/04/03
ROAD WORKS: TYPICAL SECTIONS	ISL	03	D	2025/04/03
ROAD WORKS: TYPICAL SECTIONS	ISL	04	D	2025/04/03
ROAD + WATER: STA 0+580 TO 0+720	ISL	05	D	2025/04/03
ROAD + WATER: STA 0+720 TO 0+840	ISL	06	D	2025/04/03
ROAD + WATER: STA 0+840 TO 0+980	ISL	07	D	2025/04/03
ROAD + WATER: STA 0+980 TO 1+120	ISL	08	D	2025/04/03
ROAD + WATER: STA 1+120 TO 1+260	ISL	09	D	2025/04/03
ROAD + WATER: STA 1+260 TO 1+390	ISL	10	D	2025/04/03
ROAD + WATER: STA 1+390 TO 1+530	ISL	11	D	2025/04/03
ROAD + WATER: STA 1+530 TO 1+670	ISL	12	D	2025/04/03
ROAD + WATER: GILLEY'S TRAIL	ISL	13	D	2025/03/18

TITLE	CONSULTANT	SHEET NO.	REVISION NO.	DATE
ROAD + WATER: ROAD TIE-IN SOUTH	ISL	14	D	2025/03/18
ROAD + WATER: ROAD TIE-IN NORTH	ISL	15	D	2025/03/18
ROAD WORKS: PROPERTIES 4171 AND 4170	ISL	16	D	2025/04/03
ROAD WORKS: PROPERTIES 4182 AND 4180	ISL	17	D	2025/04/03
ROAD WORKS: PROPERTY 4196 AND 4300	ISL	18	D	2025/04/03
ROAD WORKS: PROPERTY 4265	ISL	19	D	2025/04/03
SANITARY SEWER: STA 0+800 TO 1+080	ISL	20	D	2025/04/03
SANITARY SEWER: STA 1+080 TO 1+420	ISL	21	D	2025/04/03
SANITARY SEWER: STA 1+420 TO 1+660	ISL	22	D	2025/04/03
SANITARY SEWER: GILLEY'S TRAIL	ISL	23	D	2025/04/03
PARTINGTON CREEK AND IN-LINE POND	ISL	24	D	2025/04/03
DRAINAGE CHANNEL	ISL	25	D	2025/04/03
CULVERT DETAILS	ISL	26	D	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	27	A	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	28	A	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	29	A	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	30	A	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	31	A	2025/04/03
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	32	A	2025/04/03
ESC NOTES AND DETAILS: CEDAR DR UPGRADES – PHASE 1	ISL	33	A	2025/04/03
ESC PLAN: CEDAR DR UPGRADES – PHASE 1	ISL	34	A	2025/04/03
STREEET LIGHTING NOTES	DMD	1	1	28-03-2025
STREEET LIGHTING	DMD	2	1	28-03-2025
STREEET LIGHTING	DMD	3	1	28-03-2025
IRRIGATION CONTROLLER POWER	DMD	4	1	28-03-2025

Supplementary General Conditions

SUPPLEMENTARY GENERAL CONDITIONS

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1.0 DEFINITIONS

1.1 Abnormal Weather 1.1.1 **(Replace clause 1.1.1 as follows):**
Abnormal Weather" means temperature, precipitation, wind or other weather conditions in which the monthly average, differs from the statistical average for that condition in that period by more than one standard deviation, calculated based on data available from Environment Canada. Coquitlam's Burke Mountain Rain Gauge will be used to compare the rainfall summary versus the available data from Environment Canada.
City of Coquitlam Rainfall

2.0 DOCUMENTS

2.2 Interpretation 2.2.4 (1) **(Replace clause 2.2.4 (1) as follows):**
The Contract Documents shall govern and take precedence in the following order as listed in Schedule 1 of the Agreement, taking precedence over all Contract Documents.

4.0 CONTRACTOR

4.1 Control of the Work 4.1.1 ***(Add to clause 4.1.1 as follows):***
The *Contractor* is responsible for all survey layout for the construction of the Work to the design specifications and/or elevations as shown on the contract drawings or as amended on site by the Contract Administrator, unless otherwise described in the Contract Document.

4.1.2 ***(Add to clause 4.1.2 as follows):***
The Contractor shall not deposit any material upon any street, sidewalk, boulevard or other property, without the Contract Administrator's or the Owner's permission, nor shall they allow the same to remain longer than necessary. All surplus spoil and rubbish and other waste material shall be removed from the site so that the area of work is cleaned up and restored to as clean a condition as it was before the Contract started, within four days of the Contract Administrator's written request to do so, failing which the Owner may carry out the work or have the work carried out by others and recover the costs from the Contractor or may deduct the cost from any monies due or that may become due to the Contractor.

4.1.3 ***(Add new clause 4.1.3 as follows):***
Work can be performed during the normal weekday working hours of 0700h to 1900h, unless specified otherwise in Supplementary Specifications - Appendix A:

Traffic Management Detail Specifications. Written permission from the Contract Administrator will be required for any works to be performed outside of the normal working days of Monday to Friday.

No Sunday work will be permitted, except in case of emergency and then only with the written permission of the Contract Administrator and to such extent as he deems necessary.

In case the Contractor decides to work on a day which is a Statutory Holiday, they shall provide the Contract Administrator in writing at least (4) days in advance of such holiday, stating those places where said work is to be conducted. In case the Contractor fails to give such notice in advance of any Statutory Holiday, no work within the terms of the contract shall be done on such holiday.

The cost of inspections on a Sunday or on a Statutory Holiday by City staff/s will be at Contractor's expense.

4.2 Safety

4.2.2 ***(Add new clause 4.2.2 as follows):***
In an emergency, gas pipeline rupture or leak, Contact FortisBC's 24 Hour Emergency Line (1-800-663-9911) and Coquitlam Fire (911) immediately and then City of Coquitlam's Utility Control Centre (604-927-6287).

4.3 Protection of Work, Property and the Public

4.3.1 ***(Replace clause 4.3.1 as follows):***
In performing the Work, the Contractor shall protect the Work and the Owner's property and other person's property from damage. The Contractor shall at the Contractor's own expense make good any such damage which arises as the result of the Contractor's operations. If the Contractor causes damage to private property, the Contactor must obtain a written release from the owner of the damaged property.

4.3.5.1 ***(Add clause 4.3.5.1 as follows):***
The Contractor shall notify the Contract Administrator immediately if damage occurs to any City or third party utility or structure.

4.3.7 ***(Add new clause 4.3.7 as follows):***
Any lands other than those upon which the work is to be performed, which may be required for temporary facilities, storage purposes or access to the work site, other than those provided by the *Owner*, shall be provided by the *Contractor* at their own cost, with no liability to the *Owner*.

4.6 Construction Schedule

4.6.1 ***(Replace clause 4.6.1 as follows):***

The Contractor shall within the time set out in the Form of Tender prepare and submit to the Contract Administrator for their approval a construction schedule (the Baseline Construction Schedule) indicating the planned start and completion dates of major activities of the Work. The Baseline Construction Schedule shall be in more detail than the Preliminary Construction Schedule and shall indicate completion of the Work in compliance with any specified Milestone Dates, including Substantial Performance.

As part of Construction Schedule Contractor will prepare and submit a construction sequencing detail for execution of various work components in accordance with Appendix B – Traffic and Construction Staging Plan.

4.6.6 ***(Replace clause 4.6.6 as follows):***

The time for the performance of the Work shall commence on the date specified in the Notice to Proceed, or if not so specified, on the date the Notice to Proceed is issued. The Notice to Proceed will not be issued until the documentation required under paragraph 5.1.1 of the Form of Tender has been submitted and the construction schedule has been approved.

4.6.8 ***(Add new clause 4.6.8 as follows):***

Any requests to lengthen the work schedule shall be made in writing by the Contractor within five working days of knowledge of the reason for the extension. The Contract Administrator will adjust the schedule at their discretion upon receipt of a written request.

4.7 Superintendent

4.7.4 ***(Add new clause 4.7.4 as follows):***

The key personnel named in the Contractor's Tender response, shall remain in these key positions throughout the project. In the event that key personnel leave the Contractor's firm, or for any unknown reason are unable to continue fulfilling their role, the Contractor must propose a suitable replacement, and obtain written consent from the Owner. Acceptance of the proposed replacement is at the sole discretion of the Contract Administrator and the Owner.

4.8 Workers

4.8.2 ***(Add new clause 4.8.2 as follows):***

The Contractor shall, upon the request of the Contract Administrator, remove any person employed by them for the purposes of the Contract who, in the opinion of the

Contract Administrator, is incompetent or has conducted themselves improperly, and the Contractor shall not permit a person who has been removed to return to the Place of Work.

4.9 Materials 4.9.3 ***(Add new clause 4.9.3 as follows):***

The Contractor shall, at their cost,

a) Be responsible for storing all of the materials supplied for the Work either by themselves or the Owner, until it has been incorporated into the completed Work;
b) Store all materials in a manner which will prevent damage from the weather, dirt, foreign matter, vandalism and theft;
c) Arrange for and/or verify the time of delivery of all materials to be supplied by themselves or the Owner to ensure that delivery will coincide with their work schedules.
d) Examine with the Contract Administrator the quantities and details of all materials supplied by the Owner at the time and place of delivery or those materials already at the Place of Work, and prepare and sign a Statement of Materials Acceptance, specifically noting and rejecting any defective material;
e) Replace all materials supplied by themselves or the Owner which are found to be stolen, missing or damaged while under their care;
f) Replace all materials found to be defective in manufacture which have been supplied by themselves.

4.11 Subcontractors 4.11.3 ***(Replace clause 4.11.3 as follows):***

The Contractor shall, upon notice of the Contract Administrator, remove any Subcontractor employed by them for the purposes of the Contract who, in the opinion of the Contract Administrator, is incompetent or has conducted themselves improperly, and the Contractor shall not permit the Subcontractor who has been removed to return to the Place of Work. The removal of a Subcontractor under this clause shall not be considered a Change and the Contract Price and the Contract Time shall not be adjusted.

4.12 Test and Inspections 4.12.1 ***(Replace clause 4.12.1 as follows):***

The Contractor shall perform or cause to be performed all tests, inspections and approvals of the Work as described in the Contract Documents or a required by the Contract Administrator as part of Quality Control. The Contractor shall complete all the necessary testing at the frequencies described in the Contract Document unless otherwise approved by the Contract Administrator.

Acceptable test and inspection results will not relieve the Contractor of its obligations under the Contract to correct defects or deficiencies in the Work.

4.12.11 ***(Add clause 4.12.11 as follows):***
Failure to follow DFO/FLNRO BMPs and the approved permit for Instream Works or as instructed by Contract Administrator will result in shut-down of the work. The Contractor must take all steps to mitigate impacts to aquatic resources, environment and habitats before work can re-start on site. No claim will be accepted by the Owner for costs associated with this work shut-down.

4.14 Final Clean-up

4.14.1 ***(Replace clause 4.14.1 as follows):***
Prior to applying for Substantial Performance, the Contractor shall remove all surplus products, tools, construction machinery and equipment relating to the Work that is not required for the performance of the remaining Work. The Contractor shall also remove waste, debris and waste products other than caused by the Owner or Other Contractors, and leave the Place of Work clean and suitable for occupancy by the Owner unless otherwise specified in the Contract Documents or directed by the Contract Administrator.

4.16 Notice of Disruption

4.16.2 ***(Add new clause 4.16.2 as follows):***
Written notice must be provided to all properties which may be physically affected by the construction not less than one week and not more than two weeks prior to construction.

Notify occupants directly affected by the work 48 hours in advance of commencement of construction. Cost of notifying area occupants of ensuing construction and delivery of the notices is incidental to the Contract.

7.0 CHANGES

7.1 Changes

7.1.3 ***(Replace clause 7.1.3 as follows):***
Additional work that the Owner may wished performed that does not satisfy the requirements of subparagraphs (a) and (b) of GC 7.1.1 is extra work (Extra Work) and is not a Change. Pursuant to GC 8, Extra Work may be declined by the Contractor or may, upon agreement between the parties, be undertaken as Extra Work.

7.4 Optional Work

7.4.2 ***(Add new clause 7.4.2 as follows):***
If there are Optional items or Provisional items included in the *Schedule of Quantities and Prices*, those items shall be used only as directed and at the sole discretion of the

Contract Administrator through the issue of a Change Order. These items will be paid at the contract unit price as part of regular progress payments. Only quantities used will be eligible for payment. No claim will be accepted for unused Optional or Provisional quantities. Clause 9.4 Quantity Variations will not be applicable for these items.

9.0 VALUATION OF CHANGES AND EXTRA WORK

9.2 Valuation Method

9.2.4 ***(Replace clause 9.2.4 as follows):***

Once a quotation is accepted by the Contract Administrator, or other agreement reached between the Contract Administrator and the Contractor regarding adjustments to the Contract Price or Contract Time on account of a Change or Extra Work, the Contractor shall not be entitled to claim or receive additional payment, or adjustment to the Contract Time on account of a Change or Extra Work.

9.4 Quantity Variation

9.4.1 ***(Replace clause 9.4.1 as follows):***

If for any reason, including an addition or deletion under GC 7.1.1(1) or 7.1.1(2) respectively, the actual quantity of a unit price item varies by more than plus or minus the Variance Threshold Percentage from the estimated quantity for that unit price item listed in the Schedule of Quantities and Prices (the "Tender Quantity") or as otherwise agreed to pursuant to these Contract Documents, then either the Owner or the Contractor may by written notice request the other party to agree to a revised unit price, considering the change in quantities. A party shall make a request for a revised unit price as soon as reasonably possible after the party concerned becomes aware of the quantity variation.

9.4.2 ***(Delete clause 9.4.2 (2)***

10.0 FORCE ACCOUNTS

10.1 Force Account Costs

10.1.1(1) ***(Add to clause 10.1.1(1) as follows):***

Costs for the Contractor's Superintendent, Project Managers, Health and Safety Personnel, and Office/Administration Staff are not eligible for labour costs as those costs are considered incidental to the mark up owing for overhead and labour.

10.1.1(4) ***(Replace clause 10.1.1(4) as follows):***

Force Account Work performed by a subcontractor shall be paid for in the lesser of: (i) the amount provided by

subparagraphs (1), (2) and (3) of this GC, plus a mark-up of 5%, or (ii) the actual amount the Contractor pays the subcontractor including a mark-up of 10% on such actual costs to cover all overhead and profit.

12.0 HAZARDOUS MATERIALS

12.2 Discovery of Hazardous Materials 12.2.2

(Replace clause 12.2.2 as follows):
If the Contract Administrator observes any materials at the Place of Work that the Contract Administrator knows or suspects may be Hazardous Materials, then the Contract Administrator shall immediately give written notice to the Contractor and the Contractor shall immediately stop the Work or portion of the Work as required by GC 12.2.1(1).

13.0 DELAYS

13.1 Delay by Owner or Contract Administrator 13.1.2

(Add new clause 13.1.2 as follows):
The Owner may at any time suspend the work or any portion thereof provided they give the Contractor five (5) days' written notice of delay. The Contractor shall resume work upon written notice from the Owner. The Contractor shall be entitled to:

a) An extension of the Contract time equivalent to the length of suspension of work.
b) Reimbursement by the Owner for directly related out-of-pocket additional costs, reasonably and necessarily incurred by the Contractor as a result of such suspension. No additional payment will be made to the Contractor for any loss of profits or overhead.

13.3 Unavoidable Delay 13.3.1

(Add to clause 13.3.1 as follows):
Beyond the reasonable control of the Contractor also includes pandemic or community outbreak

13.8 Direction to Stop or Delay 13.8.3

(Add new clause 13.8.3 as follows):
The Contract Administrator may order the Contractor to stop work if at any time the Contract Administrator is of the opinion that there exists a danger to life or property.

13.9 Liquidated Damages for Late Completion 13.9.1

(Replace clause 13.9.1 as follows):
If the Contractor fails to meet the Milestone Date for Substantial Performance as set out in the Form of Tender, paragraph 2.2 as may be adjusted pursuant to the provisions of the Contract Documents, then the Owner may deduct from any monies owing to the Contractor for the Work:

(1) An amount of $1,000.00 for each calendar day the actual *Substantial Performance* is achieved after the Substantial Performance Milestone Date; plus

(2) All direct out of pocket costs, such as costs for safety, security or equipment rental, reasonably incurred by the Owner as a direct result of such delay.

If the monies owing to the Contractor are less than the total amount owing by the Contractor to the Owner under (1) and (2) then any shortfall shall immediately, upon written notice from the Owner, and upon Substantial Performance, be due and owing by the Contractor to the Owner.

13.9.2 ***Add clause 13.9.2 as follows)***

All in stream works shall be completed within Fisheries work Window (August 1 to September 15). Environmental approvals provided by Province and DFO are only valid for 2025. Contractor will be responsible for all the delay this may cause and mitigate consequences for this delay including bearing all costs for obtaining extension in permit approval dates.

18.0 PAYMENT

18.1 Preparation of Payment Certificate

18.1.1 ***(Replace clause 18.1.1 as follows):***

The Contract Administrator shall prepare and issue a certificate for the period ending the last calendar day of the month.

18.4 Holdbacks

18.4.2 ***(Add to clause 18.4.2 as follows):***

At the sole discretion of the Contract Administrator, an amount equivalent to 10% of the contract award value or 200% of a reasonable estimate, whichever is higher, may be held without interest until all deficiencies have been remedied and accepted by the Contract Administrator.

18.6 Substantial Performance

18.6.5 ***(Replace clause 18.6.5 as follows):***

The Owner may release any builders lien holdback on the 56th day following the date of Substantial Performance, or other date as required by law, but the Owner may hold back the amounts for any deficiencies or filed builders liens as provided in GC 18.4.2, 18.4.3 and 18.4.4.

18.6.6 ***(Replace clause 18.6.6 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 *Subcontractors*. The *Contractor* shall cooperate with and assist the *Contract*

Administrator by providing information and assistance in a 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 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 of 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.

21.0 WORKERS COMPENSATION REGULATIONS

21.2 Contractor is "Prime Contractor"

21.2.1 ***(Add to clause 21.2.1 as follows):***
Prior to the issuance of the "Notice to Proceed" the Contractor must provide a signed "Prime Contractor Designation" form as provided in Appendix IV of these Supplementary General Conditions.

24.0 INSURANCE ***(Replace section 24.0 as follows):***

24.1 General

24.1.1 **Importance of Prompt Attention to Insurance Requirements:**
The Contractor shall provide the Owner with satisfactory evidence that the insurance required to be provided under this GC is in full force and effect.

24.1.2 **Acceptable Insurance Carriers:**
The insurer issuing any policy, or other document which is evidence of insurance to the Contractor, shall be an insurer licensed by the Superintendent of Insurance in the Province

of British Columbia and registered with the Department of Insurance for Canada in Ottawa, except the Insurance Corporation of British Columbia, which is not subject to this condition.

24.1.3 **Owner's Right to Change Terms:**
Notwithstanding anything contained in the Contract Documents, the Owner will have the right to request a change to the specified terms and conditions respecting insurance at the sole option of the Owner. The Contractor will be notified in writing of any changes required by the Owner and will provide a quotation for such work.

24.1.4 **Delivery of Insurance Documents:**
All insurance policies or other acceptable specified documents shall be delivered to, and accepted by, the Owner before the Contract Documents are signed. No work shall be commenced by the Contractor or by anyone acting on the instructions of the Contractor, until the required Insurance Documents have been accepted by the Owner and the Contract Documents have been duly signed by the Owner and the Contractor.

24.1.5 **Owner's Right to Insure:**
Should the Contractor for any reason not comply with the specified requirements with respect to the insurance, the Owner will, at the Owner's option, have the right to purchase all or any part of such insurance which, in the opinion of the Owner, may be required to provide the specified insurance, and, in the event of so doing, the Owner will have the right to pay the premiums for such insurance and to withhold the amount of premiums so paid from any amount due and payable to the Contractor under the Contract.

24.2 Required Insurance

24.2.1 **General**
Damage to work (excluding Building Contracts where Section 24.3, Paragraph 24.3.1, Further Responsibilities of Contractor, applies).

The Contractor shall be responsible for any and all loss, or damage, whatsoever which may occur on or to the works, completed or otherwise, until such time as the entire works have been completed and the Notice of Acceptance has been issued by the Owner, except that loss or damage caused solely by an act of the Owner. In the event of any loss or damage occurring, the Contractor shall, on notice from the Contract Administrator, immediately put the

works into the condition it was immediately prior to such loss or damage, all at the

Contractor's expense, except where such loss or damage was caused solely by an act of the Owner.

The Contractor shall be responsible for any and all loss or damage whatsoever which may occur on or to the works, completed or otherwise, arising out of the negligence of the Contractor, any subcontractors, and the employees or agents of any of them.

24.2.2 **Public Liability Insurance:**
(Other than Automobile Third Party Liability Insurance):

Evidence of Insurance:
The Contractor shall deposit with the Owner, before the work commences, a Certificate of Insurance, signed by an authorized representative of the insurer, such certificate to be as shown in Appendix III.

Effective Dates and Terms:
The effective date of the Certificate of Insurance shall be the date of the execution of the Contract Agreement and the term of this policy shall be from such effective date until a date not less than twelve (12) months after the date of Substantial Performance completion of all work under the Contract.

Limits of Liability:
For bodily injury and for property damage shall be inclusive limits not less than $5,000,000.

24.2.3 **Public Liability Insurance (Automobile):**
The Contractor shall deposit with the Owner before the work commences a Certificate of Insurance with respect to owned automobiles on ICBC Form No. APV 47 entitled "Confirmation of Insurance Coverage" and with respect to Non-Owned Automobiles including hired automobiles and Contractual Liability on ICBC non-owned automobile policy Form APV 29 (if non-owned automobile coverage is not included under the comprehensive general liability coverage) each signed by an authorized representative of the Insurance Corporation of British Columbia.

24.3 Physical Loss or Damage With Respect to New Buildings under

24.3.1 **Responsibility for Placing Insurance:**
The types of insurance required under this section will be provided and maintained at the expense of the City of Coquitlam during the term of the Contract and will be as

Construction and/or Major Additions to Existing Structures

follows unless otherwise changed by specific endorsement to these Insurance Specifications.

24.3.2 **Insurance Coverage Required:**
Builders Risk Completed Value "All Risks" Course of Construction Insurance. This policy will be written in the names of the City of Coquitlam and the Contractor with loss payable as their respective interests may appear.

24.3.3 **Responsibility of Contractor – Limitations of cover and deductibles:**
The insurance provided by the City of Coquitlam as described herein will not provide the Contractor with full protection against any and all kinds of loss or damage which may arise out of the Contract. It is, therefore, the responsibility of the Contractor to fully understand the scope of the cover provided with particular attention to the exclusions, limitations of cover and deductible provisions contained in the Insuring Agreements of the policies and it is further the responsibility of the Contractor to take out at the Contractor's expense, whatever other additional insurance the Contractor may consider necessary or desirable for his protection subject as hereinafter provided. The Contractor shall act in the same manner on insurance made available through the City of Coquitlam as he would if he had arranged such insurance himself.

24.3.4 **Responsibility of Contractor – Direct Damage Insurance:**
If the Contractor fails to do all or anything that is required of them concerning insurance, the City of Coquitlam may do what is required and any monies expended by the City of Coquitlam for that purpose shall be repayable and recoverable from the Contractor. Should any action, failure or negligence of the Contractor result in higher insurance costs being incurred by the City of Coquitlam, such additional costs shall be payable or recoverable from the Contractor.

24.3.5 **Responsibility of Contractor – Machinery and Equipment Belonging to Others:**
Unless otherwise directed by the City of Coquitlam in writing, the Contractor shall carry insurance covering loss or damage to construction machinery, tools and equipment owned by and/or on bare rental from a third party or parties and used by the Contractor in performing the work, which insurance shall be in a form satisfactory to the City of

Coquitlam and having coverage in accordance with the actual cash value of such construction machinery, tools and equipment. Such policies shall also provide for subrogation to be waived against the City of Coquitlam. A certified copy of the policy shall be delivered to the City of Coquitlam not later than thirty days after the commencement of work under the Contract.

24.3.6 **Contractor's Waiver of Liability to Coquitlam:**
The Contractor hereby releases the City of Coquitlam from any and all liability for damages to the extent that such damages are covered by the course of construction insurance referred to in Section 24.3 of these specifications.

24.3.7 **Liability of Contractor:**
Neither the providing of insurance by the Contractor or the City of Coquitlam in accordance with the requirements hereof, nor the insolvency, bankruptcy, nor failure of any insurance company to pay any claim accruing shall be held to waive any of the provisions of this Contract with respect to the liability of the Contractor or otherwise.

24.3.8 **Responsibility of Contractor for protection of work, persons and property:**
The Contractor and all persons employed by the Contractor or under their control, and all employees and subcontractors, shall use due care that no person or property is injured, and that no rights are infringed in the prosecution of the work. Contractors shall take particular care to protect the work against loss or damage caused by riot, vandalism or malicious mischief and shall be at the expense of the Contractor provide all necessary safeguards in the form of watchmen and/or watch dog protection to prevent loss or damage of this type. The payment of deductibles is the responsibility of the Contractor and if not paid by the Contractor such amounts shall be deducted by the City of Coquitlam from payment due to the Contractor. These deductibles will normally be $250.00 each claim.

24.3.9 **Action to be taken in the event of loss or damage to the work covered by the Contract:**
When any loss or damage occurs to the work or to any materials and supplies on the site of the work, the Contractor shall remove any and all damaged or destroyed property and shall rebuild or replace the damaged or destroyed work, materials, or supplies and complete the work to the satisfaction of the Owner. For such removal, rebuilding, or replacing, the Contractor shall be entitled to receive from the Owner the amount of insurance monies

received by the Owner pursuant to the said adjustment which amount shall be paid to the Contractor as the work of rebuilding or replacing proceeds, and in accordance with the Agreement. Damage or destruction of the whole or any part of the work shall not affect the rights and obligations of either party under the Agreement, except that in such event the Contractor shall be entitled to such reasonable extension of time to complete the work as the Architect and/or Contract Administrator may decide.

24.3.10 **Further responsibility of Contractor:**
Other than with respect to loss or damage arising out of insured risks and herein before specified, the Contractor shall be responsible for all loss or damage whatsoever which may occur on or to the works completed or otherwise, until such time as the entire works have been completed and the Notice of Acceptance has been issued by the Owner, except that loss or damage caused solely by an act of the Owner.

In the event of any loss or damage occurring, the Contractor shall on notice from the Owner immediately put the works into the condition it was immediately prior to such loss or damage, all at the Contractor's expense except as previously stated.

24.3.11 **Owner Not Responsible for Loss or Damage or Loss of Use of Property of Contractors and their Employees:**
The Owner will not be responsible for securing or paying for insurance of any kind other than as specified in Section 24.3 of these specifications nor will the Owner have any responsibility whatsoever for loss or damage from whatever cause occurring to property owned, leased, or otherwise in the possession of the Contractor, subcontractors or their employees including, without restricting the generality of the foregoing, machinery, equipment, tools, supplies, and clothing at the construction site or elsewhere including loss of use of same.

24.4 Additional Insured

24.4.1 **The Contractor shall ensure the following are named as "additional insured" on the liability policy for this contract:**

- The City of Coquitlam

The City may identify private properties that are directly affected by construction. If so, the Contractor shall include the legal owners of these properties named as "additional insured" on the liability policy for this contract.

25.0 MAINTENANCE PERIOD

25.1 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 or may be deducted from the Maintenance Security, or other holdbacks. The Contractor shall promptly pay any shortfall.

27.0 CONTRACTOR PERFORMANCE EVALUATION

27.1 ***(Add new clause 27.1 as follows):***

After the completion of the Contract, the Contractor will be evaluated on their performance of the Work. The evaluation will provide percentage scores on the following categories:

1. *Contract Administration*
2. *Construction Management*
3. *Schedule Management*
4. *Communications*
5. *Resource Management and Contractor Performance*
6. *Quality Management*

An evaluation summary report may be issued to the Contractor with scores for each of these categories. Upon request, the Contractor may attend a meeting with the City to discuss the evaluation.

This internal evaluation may be reviewed for reference on subsequent tenders with the City. Evaluation scores can form part of the tender analysis and influence contract award decisions.

Evaluation Scores in categories that are below 50% may result in a suspension of tendering privileges with the City.

APPENDIX I

PERFORMANCE BOND

NO._____ $_____

KNOW ALL MEN BY THESE PRESENTS THAT

_____

As Principal, hereinafter called the Principal, and

_____

As Surety, hereinafter called the Surety, are held and firmly bound unto

_____

As Obligee, hereinafter called the Obligee, in the amount of

_____Dollars

($)

lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written contract with the Obligee, dated the_____

day of_____20_____, for

_____

_____

in accordance with the drawings and specifications submitted, therefore, which contract, drawings and specifications and addenda thereto, to the extent provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall promptly and faithfully perform said Contract (including any addenda thereto, provided such addenda do not collectively increase the amount to be paid to the Principal by more than twenty per cent (20%) of the amount of the Contract except with the written consent of the Surety) then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

Whenever the Principal shall be, and declared by Obligee to be, in default under the Contract, the Obligee having performed Obligee's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Obligee for completing the Contract in accordance with its terms and conditions, and upon determination by Obligee and Surety of the lowest responsible bidder, arrange for a contract between such bidder and Obligee and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term 'balance of the contract price', as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the Contract less the amount properly paid by Obligee to Principal.

Any suit under this Bond must be instituted before the expiration of two (2) years from date on which the Notice of Acceptance under the Contract is issued.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Obligee named herein or the heirs, executors, administrators, or successors of Obligee.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its Attorney-in-fact, this_____day of_____20_____.

SIGNED, SEALED and DELIVERED
In the presence of

)
)
)
)
)

_____

_____
PRINCIPAL

_____
SURETY

APPENDIX II

LABOUR AND MATERIAL PAYMENT BOND

(Private Contracts – Trustee Form)

NO._____ $_____

Note: This Bond is issued simultaneously with another Bond in favour of the Obligee conditioned for the full and faithful performance of the Contract.

KNOW ALL MEN BY THESE PRESENTS THAT

_____

As Principal, hereinafter called the Principal, and

_____

As Surety, hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto

_____

As Trustee, hereinafter called the Obligee, for the use and benefit of the Claimants, their and each of their heirs, executors, administrators, successors and assigns in the amount of

_____Dollars

($) lawful money of Canada, for the payment of which sum well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

SIGNED AND SEALED this_____day of _____, 20____.

WHEREAS, the Principal has entered into a written contract with the Obligee dated the_____ day of_____, 20____, for

_____

_____

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall make payment to all Claimants for all labour and material used or reasonably required for use in the performance of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A Claimant for the purpose of this Bond, is defined as one having a direct contract with the Principal for labour, material, or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include the part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment directly applicable to the Contract provided that a person, firm or corporation who rents equipment to the Principal to be used in the performance of the Contract under a contract which provides that all or any part of the rent is to be applied towards the purchase price thereof shall only be a Claimant to the extent of the prevailing industrial rental value of such equipment for the period during which the equipment was used in the performance of the Contract. The prevailing industrial rental value of equipment shall be determined, insofar as it is practical to do so, in accordance with and in the manner provided for in the latest revised edition of the publication of the Canadian Construction Association entitled "Rental Rates on Contractors' Equipment" published prior to the period during which the equipment was used in the performance of the Contract.
2. The Principal and the Surety hereby jointly and severally agree with the Obligee as Trustee that every Claimant who has not been paid as provided for under the terms of his contract with the Principal before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's work or labour was done or performed or materials were furnished by such Claimant, may as a beneficiary of the trust herein provided for, sue on this Bond, prosecute the suite to final judgment for such sum or sums as may be justly due to such Claimant under the terms of his said contract with the Principal and have execution thereon. Provided that the Obligee is not obliged to do or take any act, action or proceeding against the Surety on behalf of the Claimants or any of them to enforce the provisions of this Bond. If any act, action or proceeding is taken either in the name of the Obligee or by joining the Obligee as a party to such proceedings then such act, action or proceeding shall be taken on the understanding and basis that the Claimants or any of them who take such act, action or proceeding shall indemnify and save harmless the Obligee against all costs, charges and expense or liabilities incurred thereon and any loss or damage resulting to the Obligee by reasons thereof. Provided still further that subject to the foregoing terms and conditions, the Claimants or any of them may use the name of the Obligee to sue on and enforce the provisions of this Bond.
3. No suit or action shall be commenced hereunder by any Claimant:
    a) unless such Claimant shall have given written notice within the time limits hereinafter set forth to each of the Principal, Surety and Obligee, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal, Surety and Obligee at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the contract is located. Such notice shall be given (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by the Principal under either the terms of the Claimant's contract with the Principal or under the Mechanic's Liens Legislation applicable to the Claimant's contract with the Principal whichever is the greater within one hundred and twenty (120) days after such Claimant should have been paid in full under the Claimant's contract with the Principal; (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such claimant did

or performed the last of the work or labour or furnished the last of the materials for which such claim is made under the Claimant's contract with the Principal.

b) after the expiration of one (1) year following the date on which Principal ceased work on the Contract including work performed under guarantees provided in the Contract.

c) Other than in a court of competent jurisdiction in the Province or District of Canada in which the subject matter of the Contract or any part thereof is situated and none elsewhere, and the parties hereto agree to submit to the jurisdiction of such court.

4. The amount of this Bond shall be reduced by and to the extent of any payments made in good further and in accordance with the provisions which may be filed of record against the subject matter of the Contract, whether or not claim for the amount of such lien be presented under and against this Bond.
5. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its Attorney-in-fact the day and year first above written.

SIGNED, SEALED and DELIVERED
In the presence of

)
)
)
)
)

_____

_____
PRINCIPAL

_____
SURETY

APPENDIX III

CERTIFICATE OF INSURANCE

This Certificate issued to the City of Coquitlam is to certify that policies of insurance, as described below, have been issued to the Insured named below and are in force at this time. It is understood and agreed that thirty (30) days' prior written notice by registered mail of any material alterations, transfer, assignment or cancellation of any of the policies listed below, either in part or in whole, will be given to the holder of this Certificate.

A. This Certificate is issued to:

City of Coquitlam
3000 Guildford Way
Coquitlam, BC V3B 7N2

Named Insured and Mailing Address:

B. CONTRACT NUMBER AND/OR NAME

Description of the Work:

C. INSURANCE POLICY

Name of Insurer:
Policy Number:
Effective Date:

Liability Limit:
Expiry Date:

D. INSURANCE COVERAGE

COMMERCIAL GENERAL LIABILITY coverage is required to insure against liability from the activities arising out of operations or work in connection with the above-described project, including liability arising out of the use of City property.

D.1 The minimum limit shall be $5,000,000.00 inclusive per occurrence against bodily injury, personal injury and property damage.

D.2 The City of Coquitlam, its employees, officers, agents and volunteers are added as Additional Insureds, but only with respect to operations conducted by or on behalf of the Named Insured in connection with the above-described project, operations or work.

D.3 This insurance shall be primary as regards the City of Coquitlam, its employees, officers, agents and volunteers as Additional Insureds.

D.4 Any deductible or reimbursement clause contained in the policy shall not apply to the City of Coquitlam and shall be the sole responsibility of the Named Insured.

D.5 The insurance shall include the following coverages:

- D.5.1 Cross Liability Clause
- D.5.2 Non-Owned Automobile Liability
- D.5.3 Unlicensed Automobile Liability
- D.5.4 Blanket Contractual Liability
- D.5.5 Broad Form Property Damage Liability
- D.5.6 Owner's & Contractor's Protective Liability
- D.5.7 Products & Completed Operations Liability

D.6 Indicate provision of special coverage for this project as required by the City:

YES	NO	Special Coverage Description
( )	(**X**)	Shoring and Underpinning Hazard
( )	(**X**)	Pile Driving and Vibrations
(**X**)	( )	Excavation Hazard
( )	(**X**)	Demolition
( )	(**X**)	Blasting

Authorized Signature and Stamp

Date

Name and Title

City' broker to return to City Representative

Department

APPENDIX IV

PRIME CONTRACTOR DESIGNATION

Owner: **CITY OF COQUITLAM**
Contractor: _____
Contract / Permit #: **81832 - Phase 2**
Project / Workplace: **Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail** (the "Project")

By signing this Prime Contractor Designation form, the Contractor hereby:

1. agrees to be, and accepts designation as, the "prime contractor" for the purposes of the Workers Compensation Act, R.S.B.C. 2019, c. 1 (the "Act") and the Occupational Health and Safety Regulation, B.C. Reg. 223/2022 (the "Regulation") in respect of the Project and Workplace noted above;
2. represents and warrants that the Contractor is qualified and capable to perform the duties of prime contractor and that the undersigned signatory has the authority to accept designation as prime contractor and to bind the Contractor;
3. accepts the duty and responsibility for ensuring the activities of employers, workers and other persons at the Workplace relating to occupational health and safety are coordinated and agrees to do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and the Regulation in respect of the Workplace;
4. covenants and agrees to comply with the occupational health and safety provisions of the Act, the Regulation, any other applicable regulations under the Act, and any applicable orders;
5. acknowledges and agrees that the Owner has provided the Contractor the information known to the Owner that is necessary to identify and eliminate or control hazards to the health or safety of persons at the Workplace; and
6. agrees that the designation as prime contractor hereunder may not be assigned or revoked without the prior written consent of the Owner.

Prime Contractor Name: _____

Prime Contractor Address: _____

_____ _____
Prime Contractor Signature **Date**

_____
Print Name

Please return a signed copy of this designation to the City of Coquitlam, 3000 Guildford Way, Coquitlam, BC, V3B 7N2. If you have any questions, please contact the City of Coquitlam Health & Safety Manager at 604-927-3070.

Supplementary Contract Specifications

Supplementary Contract Specifications

to the
MASTER MUNICIPAL SPECIFICATIONS
Volume II – Platinum Book

Cedar Drive Upgrades - Sanitary Pump Station to Gilleys Trail

CONTRACT 81832 - PHASE 2

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The following Supplementary Specifications are to be considered part of the Specifications. These Supplementary Specifications take precedence over the Master Municipal Specifications.

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01 33 01S	Project Record Documents	SS 7
01 45 00S	Quality Control	SS 8 to SS 9
01 53 01S	Temporary Facilities	SS 10
01 55 00S	Traffic Control, Vehicle Access and Parking	SS 11 to SS 12
01 57 01S	Environmental Protection	SS 13 to SS 15
01 58 01S	Project Identification	SS 16
03 30 20S	Concrete Walks, Curbs and Gutters	SS 17 to SS 18
03 40 01S	Pre Cast Concrete	SS 19
04 43 00S	Channel Substrate	SS 20
26 56 01S	Roadway Lighting	SS 21 to SS 25
31 05 17S	Aggregates and Granular Material	SS 26
31 11 01S	Clearing and Grubbing	SS 27
31 11 41S	Shrub and Tree Preservation	SS 28
31 22 01S	Site Grading	SS 29
31 22 16S	Reshaping Granular Roadbeds	SS 30
31 23 01S	Excavating, Trenching and Backfilling	SS 31 to SS 32
31 24 13S	Roadway Excavation, Embankment and Compaction	SS 33 to SS 35
32 11 16.1S	Granular Subbase	SS 36
32 11 23S	Granular Base	SS 37
32 12 13.1S	Asphalt Tack Coat	SS 38
32 12 16S	Hot-Mix Asphalt Concrete Paving	SS 39 to SS 40
32 17 23S	Painted Pavement Markings	SS 41 to SS 42
32 31 13S	Chain Link Fences and Gates	SS 43
32 84 23SS	Irrigation System	SS 44 to SS 64
32 91 21S	Top Soil and Finish Grading	SS 65 to SS 72
32 92 19S	Hydraulic Seeding	SS 73 to SS 77
32 92 23S	Sodding	SS 78 to SS 82
32 93 01S	Planting of Trees, Shrubs and Ground Covers	SS 83 to SS 93
33 05 25	Horizontal Directional Drilling	SS 94 to SS 100
33 11 01S	Waterworks	SS 101 to SS 108
33 30 01S	Sanitary Sewers	SS 109 to SS 110
33 40 01S	Storm Sewers	SS 111 to SS 112
33 42 13S	Pipe Culverts	SS 113
33 44 01S	Manholes and Catchbasins	SS 114 to SS 116

1.00 CONTRACT SPECIFIC INSTRUCTIONS

1.01 Schedule of Work

All work under this Contract is to be completed within the designated Contract Duration. The Contractor must provide sufficient resources in a continuous effort and site presence to complete all the work within the allotted time. All instream work will be carried out during Fisheries Construction Window, which is between August 1 to September 15 of 2025.

Contractor will submit a detailed schedule of work including detail plan showing sequence of various works following recommendations given in Appendix B Traffic and Construction Staging Plan. A separate list should be provided for the works to be done before August 1st and during Fisheries Work Window. Contractors can also submit construction sequencing schedule of their own, if they can show that it follows the restriction of maintaining residential and farms access with due regard to Fisheries work window.

1.02 Coordination of Work

The Contractor shall be responsible to consult with all affected businesses, residents, regarding delays, detours, temporary bus stop closures, and any other works affecting any transit service in the area, and will be responsible to coordinate the works with other Contractors working in the area.

As further described in detail in Appendix A, during all phases of construction, Contractor shall provide access to all properties to the West and East of Project area. This includes Cedar Drive Sanitary Pump Station. Access to Garbage Collection Trucks shall also be maintained.

1.03 Outside Agency Approval

In accordance with the Contract Documents, the Contractor is responsible to consult with and obtain any approval required to meet and comply with all the conditions required from outside agency such as, but not limited to, BC HYDRO, FORTIS BC GAS, KINDER MORGAN INC., TELUS and etc. in the area of the place of Work.

1.04 Cooperation with Emergency and Maintenance Activities

The Contractor will be responsible to cooperate with regular maintenance or emergency vehicles and staff for access to the site when required including:

- Fire, Police, and Ambulance
- Pick up of Garbage, Recycling and Compostable
- City Utilities Maintenance (or representatives)

1.05 Site Safety

The Contractor is responsible to ensure the construction site is safe at all times for workers, pedestrians, and vehicle traffic. During non-working hours, the Contractor must ensure that the site has all potentially hazardous areas appropriately identified and protected, and also must provide appropriate signage, lighting, and markings for the direction of vehicle and pedestrian traffic, all to ensure the safety of the public. Supply and use of this equipment is considered incidental to the contract.

Manhole lids, valve boxes and other appurtenances within the roadway that may present a traffic hazard during construction must be clearly marked for traffic.

Manhole lids left raised in preparation for paving must have a rubberized protector ring for traffic safety. Supply and use of this equipment is considered incidental to the contract.

1.06 Lane Closure Restrictions

Refer to: **Appendix A**: **Traffic Management Detail Specifications**.

A Road and Sidewalk Closure Permit is required for each instance of closure and will be valid for a maximum period of one (1) week and, if still necessary, re-submittal of a Road and Sidewalk Closure Request is required.

A copy of the approved Road and Sidewalk Closure Permit must be held on site by both the Site Superintendent and the person/company responsible for the traffic control implementation.

The Contractor must take the above information into account in the preparation and submission of the Tender.

Costs to complete the works taking the above restrictions into consideration shall be incidental to work described in other sections.

Costs to complete the works taking the above restrictions into consideration shall be included in the prices bid in the Schedule of Quantities and Prices.

1.07 Survey Layout

Construction layout will be the responsibility of the Contractor. The Contract Administrator will provide AUTOCAD Drawings to the Contractor.

1.08 Location of Existing Utilities

The contractor is responsible to verify the depth and location of all utilities (watermains, storm mains, sanitary mains & etc.), including outside agency utilities (i.e. Fortis BC Gas Mains & etc.) and service connections (water, storm & sanitary services at the mains & property lines) by hand digging or by Hydro-Vac in the presence of the Inspector.

Pre-locates must be completed as soon as possible after award of the contract so changes can be completed by the Engineer prior to site construction. Contact BC One for location of outside agency utilities. The contactor will not receive any compensation or allowance for delays if work is halted due to utilities & services connections not located prior to commencing construction.

Payment for this work will be treated as incidental to payment for work described in other Sections.

1.09 Manholes & Valves

Access to manholes and valves must be maintained at all time for city utilities crews and external utility companies. In case of an emergency the cost for exposing any buried manhole or valve covers during construction will be paid by the contractor.

1.10 Accesses

The Contractor is responsible to maintain all business/residential vehicles and pedestrian accesses open at all times, the contractor may provide temporary accesses if the affected owner agrees. All costs associated with temporary accesses will be at the contractor's expense.

1.11 Verification of Dimensions and Quantities

Before proceeding with work visit site and check and verify dimensions and quantities. Report variations between drawings and site conditions to the Contract Administrator before proceeding with work.

1.12 Precautions

Protect areas under construction from damage caused by excessive erosion, flooding, heavy rains, etc. Repair or replace unprotected damaged areas as directed by the Contract Administrator at no cost to the Owner.

2.00 CONSTRUCTION ACTIVITY

2.01 Construction Materials in Sewer Manholes and Pipe

The Contractor is responsible to ensure that construction activities do not deposit construction materials (e.g. gravels) into the storm sewer or sanitary sewer manholes or pipe. The City has a video record of the pipe before construction. Prior to Substantial Performance, the City may again video inspect the lines to ensure no problems exist due to construction activities under this contract. If problems are encountered, the Contractor will be responsible for the cost of the video and all costs associated with the cleaning of the pipe.

2.02 Site Clean-up During Construction and End of Construction

The Contractor will be responsible for the complete clean-up of the work site during construction & at the end of construction and prior to the Substantial Performance review. This work is considered incidental to the Contract.

The work will include cleaning of all catch basins periodically or as directed by the Contract Administrator within the Work area, or nearby location as affected by the Work, regardless of the condition of the catch basins prior to starting the Work. All cleaning is to be performed by vacuum truck to the satisfaction of the Contract Administrator and will include off-site disposal of waste material.

Payment for this work will be treated as incidental to payment for work described in other Sections.

2.03 Pavement Markings

The Contractor will be responsible for temporary traffic markings necessary for traffic direction and safety until permanent markings are installed.

The Contractor is responsible for the permanent pavement markings after paving is complete.

2.04 Asphalt Milling Operations

Asphalt milling activities shall be done in such manner so as to cause the least disruption and inconvenience to traffic and area residents.

The Contractor will be required to provide a plan and schedule for milling sections and the subsequent paving activities and have that approved by the Contract Administrator 96 hours prior to milling operation (for each street). This schedule is to be updated as required and take into consideration weather conditions and weather forecasts to ensure work subsequent to milling can be completed in appropriate weather.

MILLING OF EXTENSIVE AREAS THAT CANNOT BE PAVED WITHIN 96 HOURS PERIOD (4 DAYS) WILL NOT BE PERMITTED.

3.00 MANDATORY MEETINGS AND CONTRACTOR REPRESENTATIVES AND SUBCONTRACTORS

3.01 Pre-Construction Meeting Requirements

(a) After the Award of the Contract, the Contractor (Project Manager & Superintendent) will be required to attend a Pre-Construction Meeting with the Contract Administrator and provide all necessary information required by the Contract Administrator prior to provision of a Notice to Proceed. Items required to be provided at the meeting include:

1. A Detailed Construction Schedule showing the start date & completion date and the durations of major work components showing how all work will be completed within the Contract Duration.
2. Proof of insurance
3. Performance Bond and Labour and Materials Payment Bond
4. WCB Clearance Letter and copy of Notice of Project
5. City of Coquitlam Business License
6. A copy of portions of your Health and Safety Plan including the Title Page, Table of Contents, and portion showing latest revision date.

(b) Contractor will also be required to attend a pre-construction meeting with Kwikwetlem First Nations (KFN) as a part of the KFN Guardian Program.

3.02 Contract Schedule, Contract Duration, and Charges

A detailed, realistic construction schedule for this project will be required to be presented at the pre-construction meeting. The schedule must show major components and durations.

All work under this project is to be completed within the designated Contract Duration as contained in the signed **Contract Agreement**, or as formally amended.

3.03 Contract Superintendent and Subcontractors

In compliance with the **MMCD General Conditions, Section 4.7, Superintendent**, the Contractor shall have a competent senior representative, (the "Superintendent") **in FULL TIME attendance** at the Place of Work while work is being performed for the duration of the contract.

This (FULL TIME) attendance is also required when work is being performed by Subcontractors.

Work done by Subcontractors is to be directed by the Superintendent and monitored on site ensuring conformance to the Contract Documents and other particular direction to the Superintendent by the Contract Administrator.

The Owner is not responsible for the direction of Subcontractors.

3.04 Changes of Contractor Representatives & Subcontractors

The Superintendent and Subcontractors indicated in the Form of Tender shall not be changed unless:

1. The Owner requests a replacement
2. The Contractor submits an application for a change, in writing, to the Contract Administrator with the change being approved in writing.

3.05 Mobilization and Demobilization

Payment for mobilization and demobilization of all equipment, labour and materials (both from the Contractor and all sub-contractors) shall be incidental.

4.00 Environmental Notes

1. The City has obtained all necessary environmental approvals for the Work. Copies of these Approvals, and/or Authorization Agreements have been provided in the Tender Documents. Contractor shall be responsible for complying with the terms and conditions specified within the various regulatory approvals and authorizations, listed below. In case of any conflict all terms and conditions in the approvals/authorisations shall prevail upon conditions given in Tender Documents. Following Approvals/authorizations have been provided as part of the Environmental Management Plan (Appendix C)
    - The Fisheries Act. Authorization under paragraphs 34.4(2)b and 35(2)(b) of the Fisheries Act
    - Water Sustainability Act – Change Approval under Water Sustainability Act – Section 11(1) Changes In and About a Stream
    - City of Coquitlam – Watercourse Protection Development Permit (23 118057 DP)
2. Contractor shall be responsible for complying with all the terms and conditions specified in the Environmental Management Plan (Appendix C) and Tender Documents

5.00 Kwikwetlem First Nations Guardian Program

5.1 City has entered into an agreement with Kwikwetlem First Nation (KFN) for a Guardian Program which focuses on environmental, cultural and archaeological impacts of projects within KFN traditional territory.

5.2 KFN is interested in various aspects and stages of the project. Some key phases/activities that may lead to increased presence on- site include but are not limited to:

- Vegetation removal / grubbing
- In-stream work
- Excavation
- Wild life Surveys

5.3 The City's Contract Administrator (CA) will arrange an onsite meeting with the Guardian Manager, Guardian(s) and the Contractor's superintendent, and the Contractor's Project Manager, prior to the start of construction. The purpose of the meeting will be to make introductions and open up lines of communication. The meeting will also provide the opportunity to review the construction schedule and phasing.

5.4 The Contractor will provide the CA, the Guardian, and fieldwork@kwikwetlem.com with a two week schedule of work, which the Contractor will update each week, while construction is underway.

5.5 The Contractor will be designated as 'Prime Contractor' for the construction site, and all attendees of the construction site, including the CA and the Guardian(s), will need to follow the safety protocols as outlined by the Contractor, to ensure a safe work site.

5.6 There will be open dialogue between the CA, the Guardian Manager, Guardian(s), and the Contractor. If the Guardian finds a situation where the Contractor is proceeding in a manner that is not acceptable with regard to environmental impacts (or a risk of environmental impacts), the Guardian will inform a Kwikwetlem Lands and Resources representative who will contact the Contractor's superintendent and the CA about the Guardian's findings. If the Contractor does not resolve the situation it will be up to the CA to determine the appropriate course of action in collaboration with a Kwikwetlem Lands & Resources representative.

5.7 The payments and fees for the Guardian Program will be responsibility of the City of Coquitlam**.**

6.0 Contract Record Keeping Provisions

6.1 **Employment Benefit Groups Reporting**

All Contractors and Sub-Contractors working on this project shall submit report on community employment benefits provided to at least three Federal Government target groups (apprentices, Indigenous peoples, women, persons with disabilities, veterans, youth, recent immigrants, or small and medium-sized enterprises and social enterprises) and submit to Contract Administrator with annual updates until Project completion.

6.2 **Project Financial Record**

Contractors will keep proper and accurate financial accounts and records, including but not limited to its sub- contracts, invoices, statements, receipts, and vouchers, in respect of the Project for at least six (6) years after the Project completion date.

END OF SECTION

1.0 GENERAL

1.3	**Submission**	Delete 1.3.2 and replace with the following	Submit one copy of an accurate project record document in final form prior to applying for Substantial Performance including any video report, test reports and Operation & Maintenance manuals. Record documents to include changes in the Issued for Construction Drawings, new elevation, offsets & location of all utilities, manhole rim, catchbasin rim, vaults, valve boxes, inverts walkways/sidewalks, and any unknown/new utilities found on site. Legal holdbacks will not be released until complete record documents, including reports and manuals, have been submitted and accepted by the Contract Administrator. Contractor to get sign off letter duly signed by the property owners when private side is affected by the work. Properties to get the sign off letters will be at the sole discretion of the Contract Administrator. Payment for all work performed under this section will be incidental to work in other Sections, unless otherwise described in Schedule of Quantities and Prices.

END OF SECTION

1.0 QUALITY

The Contractor shall provide a final product conforming to the Contract Documents and the intent of the work.

The work is to be accurate to the dimensional and tolerance requirements of the contract.

Payment will be subject to adjustments based on quality assurance tests performed by the Contract Administrator.

1.1 Quality Control (QC) by Contractor

The MMCD (2009) definition of "Quality Control" is the process by which the *Contractor* checks specific materials, products, and workmanship to ensure strict conformance with the Contract Documents.

The Contractor is fully responsible for quality control of the materials, production, and construction processes.

Quality control tests shall be performed by the Contractor, at their own expense, to ensure that products meet the contract specifications.

Failure by the Contractor to conduct adequate quality control testing during production and construction will negate the Contractor's ability to appeal the quality assurance tests used for acceptance/rejection of the work.

Under no circumstances will QC test results produced after completion of the Quality Assurance (QA) results be considered for appeal purposes

Any changes in the Work with respect to the location, grade, or line shall be approved in advance by the Contract Administrator. Failure to notify the Contract Administrator of changes in writing may result in rejection of Work.

1.2 Inspection of Work, Quality Assurance, and Material Testing, by the Owner

The MMCD (2009) definition of "Quality Assurance" means the process by which the *Owner* evaluates if the work is being constructed in accordance with the Contract Documents. This definition will be used for this contract

The *Contract Administrator* will provide construction review through spot inspections and spot materials testing for Quality Assurance.

Any materials testing results indicating a non-conformance to the Contract Documents will require construction corrective action by the *Contractor*.

All subsequent testing to corrective action to verify conformance to the Contract Documents will be the full responsibility of the *Contractor*.

Inspection review by the Owner will not relieve the Contractor from providing a product that meets or exceeds the requirements of the Contract Documents.

1.3 Inspection

Materials testing shall be as described in MMCD General Conditions, Section 4.12 with the following change:

Delete Section 4.12.2(a) and insert the following:

Where the MMCD specification clauses for Inspection and Testing indicate the Contract Administrator will arrange for all testing for work described in this section will be amended to read The Contractor will arrange for and pay for all testing for work described in this section. The testing shall take place at the following prescribed rates and as directed by the contract administrator. The contract administrator has the authority to call for testing, up to the rates and frequencies specified, at the Contractors cost.

All testing covered under this item shall be performed by a CCIL certified laboratory and technicians with copies of all test results to be sent directly to the Contract Administrator. Re-testing resulting from failed first tests shall be at the Contractors expense.

1.4 Survey Layout

All Survey Layout will be completed by the Contractor in accordance with the Contract Drawings and Coordinate System set out within them. The Contractor will be provided digital AutoCAD files but shall be responsible to confirm elevations and tie in locations and report any discrepancies prior to construction.

1.5 Testing

Contractor shall carry out inspection and testing (QC) to ensure compliance with Contract Documents. Contractor shall submit test results within one week of testing to the Contract Administrator.

The Contractor shall provide test results prior to the preparation of the payment certificate.

1.6 Contractors Responsibilities

Furnish labour and facilities to:

1. Provide access to work to be inspected
2. Facilitate inspections and tests
3. Make good work disturbed by inspection and tests

1.7 Access to Work

Allow inspection testing agencies access to Work.

1.8 Tests

Test rates and frequencies (excluding failed tests), when not defined in the MMCD or Detail Specifications Sections shall be at the following frequencies:

1. Trench Backfilling and Compaction
1.1 Compaction: 1 test / 10 lm / 300mm lift
1.2 Sieve: 1 test / placed material / 50 m^3

2. Granular Base
2.1 Compaction: 1 test/500m^2 / 100mm depth of granular base, min. 1 test if < 500m^2
2.2 Sieve: 1 test / placed material / 250 TONNES

3. Granular Subbase
3.1 Compaction: 1 test/500m^2/150mm depth of granular subbase, min. 1 test if <500m^2
3.2 Sieve: 1 test / placed material / 250 TONNES

4. Embankment (Subgrade)
4.1 Compaction: 1 test/ 50m^2 / 0.15m depth of fill, min. 1 test if < 50m^2
4.2 Sieve: 1 test / placed material / 100 TONNES

5. Asphalt
5.1 Marshall test: 1 test per 250 TONNES placed, per mix specified, min. 1 / day
ASTM D1559, D3203, C117, C136
5.2 Superpave: 1 test per 250 TONNES placed, per mix specified, min. 1 / day
CAI-SP2, ASTM D3203, C117, C136
5.3 Cores: 1 per 500 m^2/lift, in locations as directed by Contract Administrator
5.4 Continuous asphalt density testing during paving.

6. Subgrade Preparation
6.1 Compaction & Moisture: 1 test / 500 m^2, min. 1 test if < 500m^2

7.Concrete Tests
7.1 Air, Slump & 1 Set Cylinders: 1 test / 10 m^3, min. 1 set / day

1.9 Measurement for Payment

Payment for all work performed under this section will be incidental to payment for work described in other Sections.

END OF SECTION

1.4	**Measurement and Payment**	Add 1.9.2	Payment for dewatering of all excavations at the place of work shall be included in this lump sum price and include all labor, materials, equipment, monitoring, set up and removal and rental of all required equipment.
		Add 1.9.3	Payment for providing bypass arrangement for Partington Creek as required for construction will be made on lump sum basis. Creek bypass arrangement will be done in accordance with the relevant sections of Environmental Management Plan (Appendix C) and Contract Drawings (ESC Plan). This will include provisions of all facilities, maintaining and removal of bypass and complete restoration as per original conditions.
		Add 1.9.4	Payment for the sheet piles along Cedar Drive and Partington Creek will be paid by square meter of sheet pile driven. Payment for all work performed under this item to include supply and installation and all other works incidental to installation of sheet piles for this section including removal after construction has been completed

END OF SECTION

1.0	**GENERAL**	Add 1.0.6	The *Contractor* is responsible for all temporary traffic control on Cedar Drive required for completion of the work. The *Contractor* will be responsible to provide a Traffic Management Plan (TMP) for approval before Notice to Proceed will be issued. TMP is to be prepared by a qualified professional to the satisfaction of the Contract Administrator and as per requirements of Appendix A (Traffic Management Detail Specifications) and Appendix B (Traffic and Construction Staging Plan). The TMP shall outline the approach to traffic management, show recognition and minimization of risks, indicates signing locations, identify Traffic Control Persons (TCP) stations, show lane shifting and proposed closures. The Contractor is responsible to ensure and maintain access to all properties on Cedar Drive and City Pump Station, all business/residential vehicles, cyclists and pedestrian access must be open at all times. The contractor may provide temporary access if the affected owner agrees. All costs associated with temporary access will be at the contractor's expense.
		Add 1.0.7	A Road and Sidewalk Closure Permit is required from Coquitlam for all work affecting pedestrian and traffic flow related to construction. A permit is required for each specific construction interference with pedestrian and traffic flow. The road and sidewalk closure permit form can be obtained for use from the City's website at http://www.coquitlam.ca. The Contractor must follow the approved TMP. Any changes to this TMP must be submitted to City's Traffic Operations for approval.
		Add 1.0.8	Refer to Appendix A – Traffic Management Detail Specifications
1.4	**Traffic Control**	Delete 1.4.1 and replace with the following	The Contractor shall conduct his operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business and residences adjacent to the Place of Work. No greater quantity of work shall be undertaken at any one time than can be properly conducted with due regard to the rights and interests of the public as may be determined by the Contract Administrator. The Contractor is to provide at all times safe and convenient means of approach and entrance to adjoining lanes, driveways, buildings and property both for vehicles and pedestrians to the satisfaction of the Contract Administrator. For this purpose, he shall construct and maintain suitable and safe platforms, approaches, structures, bridges, diversions or other works. Where traffic must cross open trenches, the Contractor shall provide suitable bridges. Where trenches have been backfilled or where road improvements are incomplete the Contractor shall take any steps necessary to prevent potholes or other traffic hazards. Where the Contract Administrator so instructs or where Contract Specifications so require, the Contractor shall provide temporary asphalt patching of such hazards.
		Add 1.4.9.3.1	The *Contractor,* as required by the *Contract Administrator* and the City, is to supply Construction Zone information signs (stationary), refer to MMCD 01 58 01 for the required identification signage.

	The *Contractor* is responsible for the removal of the signs at the completion of the work.
Delete 1.4.10.1.3 and replace with the following	When workmen or equipment are employed over travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

END OF SECTION

1.0 GENERAL

1.0.3	**Erosion and Sediment Control Supervisor**	Add 1.03	The Erosion and Sediment Control (ESC) Supervisor is the Qualified Professional who is experienced in implementing ESC Plans and who is responsible for the inspection and monitoring of ESC Facilities to ensure these are installed and maintained in accordance with the ESC Plan, and if necessary, are modified during construction to ensure compliance with the Stream and Drainage System Protection Bylaw No. 4403, 2013.
		Add 1.04	Reference should also be made to the relevant terms and conditions contained in the Authorisation under Paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*, Change Approval granted under *Water sustainability Act*, section 11(1) Changes in and About a Stream and City of Coquitlam Watercourse Development Permit.
1.2	**Temporary Erosion and Sediment Controls**	Delete 1.2.1 and replace with the following	Properly drain all portions of the site. Protect the site and the watercourses to which it drains, directly or indirectly, against erosion and siltation in accordance with the City of Coquitlam Stream and Drainage System Protection Bylaw No. 4403, 2013 during construction and until the maintenance period is completed. Ensure no silt, gravel, debris or other deleterious substance resulting from construction activity discharges into existing drainage systems or watercourses or onto highways or adjacent property. The *Contractor* is responsible for all damage that may be caused by water backing up or flowing over, through, from or along any part of the work or otherwise resulting from his operations. Keep existing culverts, drains, ditches and watercourses affected by the work clear of excavated material at all times. When it is necessary to remove or alter any existing drainage structure, provide suitable alternative measures for handling the drainage. Adequately support culverts and drainpipes across trenches to prevent displacement and interference with the proper flow of water due to trench settlement. Sweep streets, and clean catch basins, manhole sumps, detention tanks, and maintain siltation controls as often as the *Contract Administrator* and the City deems necessary. Follow all Federal and Provincial regulations and guidelines respecting protection of fish, fish habitat, and watercourses.
		Delete 1.2.2.2 and replace with the following	.1 Work around watercourses shall be done in accordance with all federal, provincial and local government environmental legislation, bylaws and applicable standards. Work around watercourses will be undertaken in a manner consistent with Requirements and Best Management Practices for Making Changes In and About A Stream in British Columbia and Measures to Protect Fish and Fish Habitat outlined by DFO at https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html as well as applicable Pathway of Effects outlined by DFO at: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html .2 Notwithstanding federal and provincial legislation and standards, the Contractor's work around watercourses must also meet City of Coquitlam Stream and Drainage System Protection Bylaw 4403, 2013.

			.3 The Contractor shall follow the Erosion and Sediment Control Plan as contained in Contract documents. .4 Do not undertake work below top of bank of watercourses without appropriate Notice or approval from the province. .5 Do not clear riparian trees, other than those outside of the Streamside Protection and Enhancement Area (SPEA). .6 Do not operate construction equipment in watercourses. .7 Do not dump excavated fill, waste material or debris into or adjacent to watercourses. .8 Design and construct temporary crossings to minimize erosion to watercourses.
		Add 1.2.2.9	All work must be carried out during favorable and low water conditions.
		Add 1.2.2.10	Any fill used on this project shall be certified inert and from a source which is confirmed to be free of contaminants.
		Add 1.2.2.11	All work within a watercourse must be undertaken and completed in isolation of all flowing water to maintain downstream water quality and unrestricted flows.
1.4	**Environmental Protection**	Add 1.4.3.5	Immediately contain and clean up any leaks and spills of prohibited materials at the *Place of Work*.
		Add 1.4.3.6	Ensure that a well-stocked spill kit is on-site at all times and that the *Contractor*'s employees are familiar with appropriate spill response techniques.
		Add 1.4.3.7	Immediately notify the *Contract Administrator* and the City of any leaks or spills of prohibited materials that occur at the *Place of Work*.
		Add 1.4.3.8	Ensure that any fuel stored on-site is located at least 15 metres from the nearest stream, and is placed within a bermed and lined area, in order to prevent leaks or spills into the environment.
		Add 1.4.3.9	All equipment and machinery must be in good working condition (power washed), free of leaks or excess oil and grease. No equipment refueling or servicing shall be undertaken within a minimum of 15 meters of any water course or surface water drainage.
		Add 1.4.3.10	During all phases of the operation, the Contractor shall take precautions to abate nuisance caused by mud or dust by clean up, sweeping, sprinkling with water or dust control, or other means as necessary to accomplish results satisfactory to the Contract Administrator.
1.6	**Measurement and Payment**	Delete 1.6.1 and replace with the following	Payment by allowance for all ESC work identified in the Environmental Management Plan (Appendix C) and this section will be determined by the QEP and Contractor and must be approved by *Contract Administrator* prior to the work taking place. Payment for all ESC work, unless shown otherwise in the Schedule of Quantities and Prices, performed under EMP and this section will be made on force account basis as described in MMCD GC 10 and Contract Supplementary Specifications.
1.9	**Archaeological / Historical Resources**	Add 1.9.1	Archaeological monitoring will be conducted during the excavation of the channel. Should soils that seem unique or have high likelihood of containing archaeological materials, Archaeological Monitors may

require a small area to be set-aside for a small quantity of soils for raking through and identify. Payment for this work will be considered as incidental to payment for work described in other sections.

Add 1.9.2 — Immediately cease work and inform the *Contract Administrator* and the City, if any archaeological or historical resources are encountered during construction. Leave these resources in place and do not disturb them in any way.

Add 1.9.3 — The Contractor and the site staff will be required to attend a one hour on-site training session regarding Archaelogical Chance Find Procedures. City will make all necessary arrangements. This will be considered as incidental to the work described in other Sectons. Reference may be made to Appendix D.

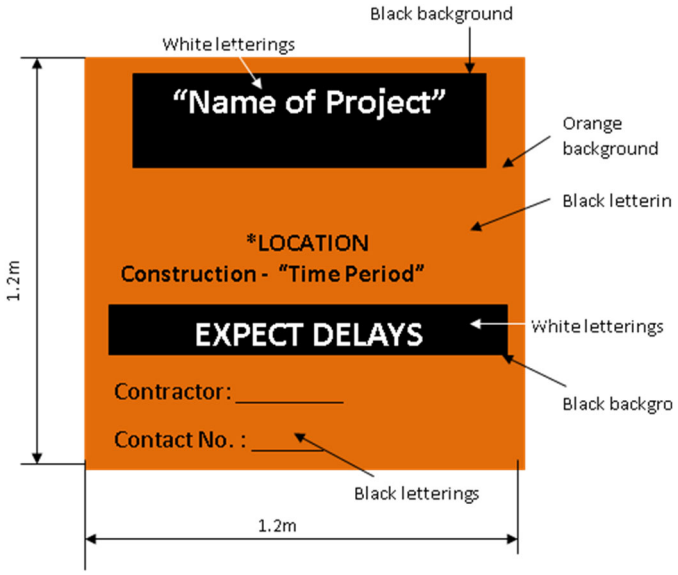
END OF SECTION

1.3 Measurement and Payment

Delete 1.3.1 and replace with the following

Payment for the installation of 1.2m x 1.2m static construction Information signs as shown in Appendix A – Traffic Management Detail Specifications and includes supply, placement & removal and will be incidental to payment for work described in other Sections, unless shown otherwise in the Schedule of Quantities and Prices.

Signs must be removed prior to the Contractor applying for Substantial Performance.



END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.3 and replace with the following	Payment for machine placed or hand formed C4 narrow base and median narrow concrete curb and gutter, excluding granular subbase & base, includes supply and placing of the concrete curb and gutter, tie-ins, transitions, subgrade preparation, compaction, saw cutting, and will cover all straight, curve and slotted sections and will be made separately for each specified type. Payment for excavation and disposal of excavated material will be made under payment item, Common Excavation – offsite disposal, in the Schedule of Quantities and Price. Payment for granular subbase and granular base under curb and gutter will be made under payment items in Section 32 11 16.1S and 32 11 23S, Granular Subbase and Granular Base, respectively.
		Delete 1.4.5 and replace with the following	Payment for concrete sidewalks, letdowns, driveways, walkways, raised concrete islands, stamp concrete, infills, concrete exposed aggregate and all concrete ramps includes supply and installation, saw cutting, regrading of driveways for proper tie-in, field fit and adjustments, subgrade preparation under the concrete sidewalks, in-fills, driveways and walkways, and will be made separately for each specified thickness and type of finish. Payment for excavation and disposal of native excavated material will be made under payment item, Common Excavation – offsite disposal, in the Schedule of Quantities and Price. Payment for granular subbase and granular base under curb and gutter will be made under payment items in Section 32 11 16.1S and 32 11 23S, Granular Subbase and Granular Base, respectively.
		Add 1.4.10	Payment for Detectable/Tactile Warning Surface Tile includes supply and placing of Access Tile Model # ACC-R-_x_ (or approved equal) Truncated Dome Detectable Warning Tactile Surface replaceable cast in place - Yellow Color, installation as per the Manufacture's Specifications and as specified in the Schedule of Quantities and Prices.
2.1	**Materials**	Delete 2.1.5.1 and replace with the following	Hand-formed and hand-placed concrete: Slump: 80 mm Air entrainment: 5 to 8%. Maximum aggregate size: 20 mm. Minimum cement content: 335 kg/m3. Minimum 28 day compressive strength: 32 MPa.
		Add 2.1.7	Tactile warning surface tile shall be replaceable cast-in-place style. Truncated domes shall be in square grid pattern with a 5 mm nominal raised height, base diameter of 23 mm and top diameter of 11.5 mm. Dome spacing range shall be between 40 mm – 60 mm. Color of the panel shall be Federal Yellow (Y) per US Federal Standard 595B Table IV, Color No. 335. Minimum size of the panel shall be 600 mm by 1200 mm.
3.0	**EXECUTION**		
3.5	**Concrete Placement**	Delete 3.5.9 and replace with the following	The *Contractor* is responsible for adjusting all utility manhole frames and valve boxes, belonging to Coquitlam and/or other agencies that are affected by the road works. All adjustments to utilities must be completed to the satisfaction of the utility owner. Riser rings will not be accepted.

The *Contractor* should note that certain utility owners may decide to complete their own adjustments. The *Contractor* will be required to cooperate with any utility company providing their own adjustments.

The *Contractor* shall be responsible to contact the appropriate utility company within a minimum of seventy-two (72) hours of the work. No adjustment shall be made without the written approval of the utility company. All manholes must be vertically adjusted a minimum of twenty-four (24) hours prior to concrete placement.

3.9	**Expansion Joints**	Delete 3.9.1 and replace with the following	Form transverse expansion joints at both ends of curb returns and at maximum spacing of 9.0 m for sidewalks, 30.0 m of curb and gutter, at each end of driveway crossing, at tangent point of circular work, and on either side of catch basins.

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.3 and Replace with Following	Payment for concrete lock block wall will be by blocks of different sizes and dimensions and includes sub grade preparation as shown on Contract drawing. Payment will include all work and incidentals, site preparation, 19mm Clear Crush Drain Rock backfill, SDR28 perforated pipe, weep hole, etc. Measurement of height of all for purposes of calculating areas for payment will be taken from the bottom of the installed block to top of the block. Payment will be made at the respective unit prices bid in the Schedule of Quantities and Prices. Payment for excavation and disposal of excavated material for the wall construction and removal of any existing retaining wall will be considered as incidental.

END OF SECTION

1.0 GENERAL

.1 Section 04 43 00S refers to all materials, labour, equipment, and services required for channel substrate supply and installation.

Materials for the channel substrate include:

.1 Gravel Mix

.2 Boulders

1.1 Related Work

.1 Roadway Excavation, Embankment and Compaction Section 31 24 13

1.2 Samples

.1 Samples of the materials are to be provided for review by the Contract Administrator prior to installation.

1.3 Measurement and Payment

.1 Payment for supply and installation of gravel mix will be based on actual volume placed on site.

.2 Payment for supply and installation of boulders will be based on the actual number of boulders placed on site.

1.4 Submittals

.1 Provide samples to be approved by the Contract Administrator or arrange for the Contract Administrator to approve the samples at the source, prior to delivery to the site.

2.0 Products

.1 Materials

.1 Gravel Mix

- .1 Size: 10mm to 137mm dia.
- .2 Average size: 74mm dia.
- .3 Up to 10% small, rounded boulders allowed (137mm to 160mm dia.)
- .4 Up to 5% washed sands content allowed

.2 Boulders

- .1 Stone type: not specified
- .2 Size: 0.6m to 0.8m dia., 0.6m min. height, generally round in form
- .3 Colour: Grey
- .4 Finish: Smooth surfaced “river rock”

3.0 Execution

.1 Placement

.1 Boulders are to be placed prior to the gravel mix placement. The total quantity of boulders is to be placed randomly and to be spread evenly over the entire channel bottom area.

.2 Gravel Mix to be placed covering the area shown on the contract drawings to the minimum depth specified.

END OF SECTION

1.0	**GENERAL**		
1.3	**Shop Drawings**	Delete 1.3.4 and replace with the following	Shop drawings for pole structures, where required, to be sealed by a Professional Engineer registered in British Columbia.
1.4	**Electrical Energy Supply**	Add 1.4.4	The Electrical Contractor shall process a letter of application to the City of Coquitlam for the Utility Company and attain all required permits.
1.5	**Contractor Qualifications**	Add 1.5.3	All on-site traffic signal installations shall be under the responsibility of a primary journeyman electrician with IMSA Level 1 Roadway Lighting Certification and have a minimum of three (3) years experience maintaining and installing street lighting systems. This primary journeyman electrician is expected to be on the work site and report work progress to City of Coquitlam's Traffic Operations staff, in addition to reporting to the Contract Administrator.
1.6	**Permits and Tests**	Add 1.6.4	Contractor shall provide the BC Safety Electrical Permit, and arrange all inspections with the City. The inspection entails, but not limited to, Coquitlam's Street Lighting Inspection Report, which can be obtained from Coquitlam's Traffic Operations staff.
		Add 1.6.5	Contractor to obtain approval of all buried portions of the installation from the City Inspector before any backfill is commenced.
1.9	**Measurement and Payment**	Add 1.9.4	Supply and installation of conduits / ducts to include all labor, equipment and materials required to complete the installation as specified in the contract and/or shown on Contract Drawings. Payment includes coordinating with Third Party Utilities for supply and delivery/pick up of supplied materials. Payment will be for each complete set of joint trench crossing as specified in the contract documents.
2.0	**PRODUCTS**		
2.1	**General**	Delete 2.1.2 and replace with the following	All products supplied to be new, in accordance with Contract Documents. All products are to meet Canadian Electrical Code requirements and be certified by either CSA, UL©, or Intertek Testing Systems (Warnock Hersey) and be supplied with the certifier's label.
		Delete 2.1.3 and replace with the following	All products shall be in accordance with the City of Coquitlam's List of Approved Materials and Products List. Any products not listed with in the Approved List shall default to the current BCMOTI specification.
		Delete 2.1.5 and replace with the following	Equipment models listed within the City of Coquitlam's List of Approved Materials and Products shall be confirmed with the City immediately prior to their order to ensure that they are current. Cut-sheets, equipment make, model and serial number list to be provided to the City by the Contractor.
2.2	**Conduit**	Add 2.2.1.3	All exposed metallic surfaces to be hot dip galvanized.
2.3	**Trench marker Tape**	Add 2.3.2	Detectable (Magnetic) marker tape shall be used in all trenches containing interconnection (communications) conduit.

2.6	**Concrete Bases**	Add 2.6.2	Maximum of four (4) conduits shall enter the base of a luminaire pole, however more than four (4) may enter a service base.
2.8	**Conductors and Cables**	Add 2.8.5	.1 Minimum conductor size to be as follows, unless specified otherwise on Contract Drawing: .1 No 6 AWG for feeder conductors in conduit. .2 No 8 AWG for bond conductors in conduit. .3 No 12 AWG for luminaire conductors in poles.
2.9	**Conductor Tags**	Delete 2.9 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.11	**Fuses and Fuse Holders**	Delete 2.11 and replace with the following	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.13	**Receptacles**	Add 2.13.3	Receptacles shall have a spring loaded cast aluminum covers.
		Add 2.13.4	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.14	**Luminaires**	Add 2.14.6	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.19	**Service Panels**	Add 2.19.1	Type 40A 120/240V, 60A 120/240V roadway lighting and 100A 120/240V combination roadway lighting / traffic signal, per Contract Drawing to include items listed within the 2009 MMCD Section 34 41 13 - Traffic Signals - 2.11.2
		Add 2.19.2	Refer to the City of Coquitlam's List of Approved Materials and Products.
2.20	**Wire Anti-Theft Devices**	Add 2.20.1	Handhole access shall utilize security covers with reinforced backing bars.
3.0	**EXECUTION**		
3.1	**General**	Add 3.1.5	During the installation of the lighting system, maintain the existing system as noted on the Contract Drawing. If temporary or permanent relocations of related lighting equipment are required, such equipment shall be reinstated as required under the Contract Documents or as directed by the Contract Administrator.
3.3	**Concrete Bases**	Add 3.3.7	Concrete service bases detailed on Standard Detail Drawings CE1.3 and CE1.4, Type C1 and C3 service bases shall have five (5) conduits. See Coquitlam Standard Detail Drawing SS-E7.3.
		Add 3.3.8	All concrete bases shall be pre-cast concrete only, unless noted on Contract Drawing or directed by the Contract Administrator.
3.4	**Junction Boxes and Vaults**	Delete 3.4.1 and replace with the following	Install junction boxes as shown on Standard Detail Drawings E2.2 to E2.4. Install vaults as shown on Coquitlam Standard Detail Drawing SS-E2.5.
		Add 3.4.5	Bell end fittings shall be installed in all conduits entering junction boxes or vaults.

		Add 3.4.6	All junction boxes shall be provided with RPVC bars to support electrical connections and fuse holders. The RPVC bars shall be attached into the junction box side walls with the electrical connections/fuse holders tie-wrapped in place and installed in the up-right position.
		Add 3.4.7	Junction boxes requiring 3 or more sections must be approved by the City of Coquitlam's Traffic Operations staff.
3.5	**Underground Conduit**	Delete 3.5.2 and replace with the following	Minimum cover over conduits to be 600 mm in boulevard areas and 900 mm in roadway areas, unless otherwise specified in the contract documents.
		Delete 3.5.3 and replace with the following	Place trench marker tape 300 mm above installed conduit in trench. Trench marker tape not required for conduits installed via trenchless technology.
		Delete 3.5.5 and replace with the following	Empty conduits shall have a No. 8 HB Yellow/Green Mk pull string and capped at both ends.
		Add 3.5.6	Conduit run shall contain no more than the equivalent of 4 – 90 degree bends.
		Add 3.5.7	Conduits shall be blown out with compressed air, from both ends if necessary, then swabbed out to remove stones, dirt, water and other material which may have entered during installation.
		Add 3.5.8	All conduits entering poles and cabinets shall be sealed with "Duct Seal".
		Add 3.5.9	Conduit depth of bury to be recorded when a trenchless technology method is used.
		Add 3.5.10	Conduit shall not be bent in the field. Only factory bends will be accepted.
3.7	**Electrical**	Delete 3.7.2 and replace with the following	Mount electrical service panels in service base or on poles as shown on Standard Detail Drawings E7.2, E7.6 to E7.9, as well as Coquitlam Standard Detail Drawings SS-E7.3 to SS-E7.5.
3.8	**Wiring**	Delete 3.8.3 and replace with the following	Make conductor splices in handholes. See Standard Detail Drawing E7.11 for splice details.
		Delete 3.8.6 and replace with the following	Wire each luminaire and receptacle separately from the base of pole.
		Delete 3.8.7 and replace with the following	Neatly arrange and bundle wiring in junction boxes, pole handholes and service panels. Conductor connections in all access points to be installed in the up-right position, allowing for easy access
		Delete 3.8.11 and replace with the following	Bond all luminaires and receptacles with No. 12 RW90 green conductor, and steel junction box lids with No. 8 RW90 green conductor.
3.9	**Pole Mounted Receptacle**	Delete 3.9.1 and replace with the following	Pole mounted receptacles to be installed as detailed on the Contract Drawing and Coquitlam Standard Detail Drawings SS-E7.19 to SS-E7.23.

3.10	**Luminaires and Photocells**	Add 3.10.4	NEMA wattage label shall be visible at the bottom of the luminaire on all fixtures.
3.11	**Grounding & Bonding**	Add 3.11.5	Ground plates and grounding conductors are to have a minimum of 5 meters clearance between them and other utility grounding.
		Add 3.11.6	Remove all paint around bonding studs on inside of pole to expose the galvanized or metal surface prior to bonding equipment.
3.13	**Pole Finish Application**	Delete 3.13 and replace with the following	.1 Prior to producing a powder finish product, the supplier must provide a Certificate of Compliance indicating that they have met or exceeded the following specifications. The supplier will name their independent testing agency and this information will be submitted to the City for their files. .2 The application process will be as follows: .1 The pole or product will be hot dip galvanized. .2 Powder will only be applied after the product is completely fabricated. No welding or bending will take place after the powder is applied. .3 The pole or product will be thoroughly cleaned by brush blasting in accordance with SSPC-SP7. The brush blast will maintain a minimum profile of 0.5 mils. If brush blasting is done off site, then the product will be covered and shielded from any dirt or moisture during its return to the powder applicators facility. Where poles or products are not kept clean and dry or have any signs of flash rust they will be returned for further brush blasting. .4 Once at the applicators facility the pole or product will be thoroughly cleaned and dried with an air gun. All hand marks or grease spots will be cleaned with a mild solvent. .5 After brush blasting the entire pole or product will be pre-baked in an oven at 220 degrees C for at least 30 minutes to 1 hour, depending on steel thickness. The pre-baking must be done to prevent out-gassing during the curing cycle. .6 The base powder coat will then be applied electrostatically while the pole or product is cooling from the 220 degrees C pre-bake period to allow the powder to melt and fuse to the surface. The base coat will be a minimum of 3 mils in thickness. .7 After base coat is applied and set the topcoat will be applied to a thickness of 3 to 5 mils. The pole or product will be returned to the oven and heated to 190 to 220 degrees C (temperature will not exceed pre-bake) for a minimum of 25 minutes, depending on steel thickness. Thicker product material may require longer bake cycles to fully cure. Upon removal of the pole or product from the oven it will be left to rest until the pole or product is cool enough to the touch. .8 Once the topcoat has cured and the poles or product cooled, they will then be individually wrapped (min 4" overlapping method) with 1/8" foam wrap over the entire pole or product. The poles or product will be bundled together and separated with suitable wood dunnage to avoid contact between the poles, product or other bundles. All bundles themselves will be fully wrapped with

foam and with stretch-wrap as noted above. The poles or products will be handled and shipped with great care to prevent damage; damaged product will be cause for rejection of the item(s).

.3 Testing process will be as follows:

.1 Each run of product in an oven will have at least one sample tested for:

.2 Adhesion – The finished powder surface will have minimum pull-off strength exceeding 1000 PSI as tested in accordance with ASTM D4541.

.3 Quality – The finished powder surface will be free from any holidays (skips or misses) as tested in accordance with ASTM D4541. The product will also be free from wrinkles, orange peel, cracking, pinholes, fish eyes, blisters, etc. by visual inspection.

.4 Color – The color will be verified to be within 3 DE of specialized color.

.5 An independent firm such as CanSpec Testing who are qualified to test powder finish will do the testing at the supplier's expense. The result of tests must accompany the Certificate of Compliance and will be made available to the City or their representative upon request. A supplier who fails to test product as noted above will have their product rejected until the testing is completed and the product deemed acceptable by the testing agency.

.6 Where the tested product fails on a given production run then a minimum of 30 % of the entire production run will be tested. If no other failures are found then the individual failed product will be stripped, reapplied and re-tested until it passes. If any of the 30% of product tested fails then the entire order will be stripped, reapplied and retested until it passes.

.4 Field repairs will be undertaken as required to fix any scratches or imperfections in the final finish. Field repairs will be done as follows:

.1 Feather the damaged area with sandpaper.

.2 Clean area with solvent.

.3 Let dry.

.4 Neatly brush on an application of Aliphatic Urethane Acrylic Semi-Gloss High Build applied at 2-4 mils DFT over the entire sanded and damaged area. The ambient conditions will be dry and over 10 degrees C when the paint is applied.

.5 The pole supplier will warranty the integrity of the surface for a minimum of 1 year from the date of installation. The warranty will include all labour and materials required to provide replacement product if required. The powder finish will be the responsibility of the pole supplier. The warranty will apply to fading, blistering, cracking or chipping of the surface.

END OF SECTION

2.0 PRODUCTS

2.3 Pit Run Gravel

Add to 2.3.2

The use of recycled concrete shall be approved by the *Contract Administrator* and the City prior to use.

Add 2.3.3

Asphalt millings free from contaminated and other extraneous material, conforming to the specified gradations may be used as pit run gravel. The use of asphalt millings shall be approved by the *Contract Administrator* and the City prior to use.

2.7 Granular Pipe Bedding and Surround Material

Add to 2.7.1

All recycled or other extraneous materials shall be approved by *Contract Administrator* and the City prior to use.

2.10 Granular Base

Delete 2.10.2

Add 2.10.3

All 25 mm minus granular base is to conform to the following gradation specifications for Collector / Arterial Roads:

Sieve Designation (mm)	Percent Passing (%)
25	100
19	80-100
12.5	75-90
9.5	50-85
4.75	35-70
2.36	25-50
1.18	15-35
0.30	5-20
0.075	0-5

Add 2.10.4

The intention of the Gradation Chart is to identify the desired mix of size of aggregate in the granular base. The Target Percentage Passing is the middle of the shown Range.

Tests that show sieve values of Percent Passing that are consistently low or consistently high in two (2) or more consecutive tests will be considered to be non-conforming.

2.11 Recycled Aggregate Material

Delete 2.11.1 and replace with the following

Aggregates containing recycled material may be utilized if approved by the Contract Administrator and the City. In addition to meeting all other conditions of the specifications, recycled material should not reduce the quality of the construction achievable with quarried materials. Recycled material shall consist only of aggregates, crushed portland cement concrete, or asphalt that is free of impurities.

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.1 and replace with the following	Payment for all clearing and grubbing will be made at lump sum price and include removal and disposal of all branches, stumps, trees, timbers, logs, planter box/wall, grass and vegetation including stripping of 150mm of native top soil to complete the work as shown on the Contract Drawings or as directed by the Contract Administrator. Payment includes trimming of small branches from trees or hedges as required, branch cutting/pruning to have a clean cut flush to branch collar and use of an approved tree paint to repair damage to surviving vegetation where branches have been removed.

END OF SECTION

1.3	**Measurement and Payment**	Delete 1.3.1 and replace with the following	Payment for all work, unless included in the Schedule of Quantities and Prices, performed under this section will be incidental to payment for work described in other Sections.
2.0	**PRODUCTS**		
2.1	**Materials**	Add 2.1.10	Protective Fencing: Posts - Pressure treated wood 100 mm dia.; Post to be 1.8 m to 2.0m in height at 2.0 m O.C. Snow fence as per Coquitlam Approved Products List; Flagging Tape - 4" Orange glow - 'Tree Retention Area'.
3.0	**EXECUTION**		
3.1	**Existing Trees**	Add 3.1.7	The *Contractor* is responsible to minimize damage to all trees which are to remain.
		Add 3.1.8	The *Contractor* will be responsible for all claims and costs including the cost of examination by an Arborist, repair, removal and replacement of trees, as required by the Arborist, the *Contract Administrator* and the City for tree damage where proper notification was not received from the *Contractor*. Damage will be assessed based on the International Society of Arboriculture Guidelines. The term shall be for a period of one year following the date of Substantial Performance of the *Work*.
		Add 3.1.9	Place protective fencing/barricades as detailed on Coquitlam Standard Detail Drawings COQ-R26 and as shown on the Contract Drawings. *Contractor* shall maintain fence in good condition during construction.
		Add 3.1.10	When work is to be performed inside fenced areas, *Contractor* shall take care to avoid damage to existing vegetation. Work to be done inside areas of existing vegetation to be retained includes: .1 Removal of isolated trees as directed by the *Contract Administrator* and the City. .2 Selective pruning and tree removal at edges to create tidy and well-shaped forest edge. .3 Placing planting soil and planting of trees.
		Add 3.1.11	Do not park, service or fuel vehicles within the vegetation retention areas.
3.4	**Pruning**	Add 3.4.2	Do not cut roots or branches of retained trees without approval of the *Contract Administrator* and the City.

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4 in its entirety and replace with the following	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.1 and replace with the following	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.

END OF SECTION

1.0 GENERAL

1.8	**Limitations of Open Trench**	1.8.1 Replace last sentence with the following	If circumstances do not permit complete backfilling of all trenches, and where permitted by the *Contract Administrator* and the City, adequately protect all open trenches or excavations with approved fencing or barricades and, where required, with flashing lights.
		Add 1.8.2	The use of road plates to cover excavations and restore travel lanes is not permitted in late Fall, Winter or if forecast indicates temperature equal or below 2 degrees Celsius, unless otherwise permitted by the Contract Administrator. Where construction necessitates the use of road plates, the Contractor is responsible for properly securing them (either pinned or recessed into the pavement) and feathered a minimum of 300mm with existing road asphalt on all four sides. The Contractor is responsible for repairing any pavement damage related to the plate installation.
1.10	**Measurement and Payment**	Add to 1.10.9	Payment for imported trench backfill, 75mm minus pit run gravel (in accordance to Clause 2.3 Pit Run Gravel in Section 31 05 17 – Aggregates and Granular Materials), includes supply, transport, placement, adjustment of moisture content and compaction to 95% modified proctor density. Payment includes the offsite disposal of the unsuitable native material. Payment for imported backfill will be made by measurement of volume confirmed by the tonne delivered to the Place of Work based on truck weigh slips. Weigh slips must be submitted to the Contract Administrator on a daily basis. Weigh slips which are not submitted daily will not be accepted for payment.

2.0 PRODUCTS

2.2	**Use of Specified Materials**	Delete 2.2.1.2	Delete Pit Run Sand
		Delete 2.2.3.3	Delete Pit Run Sand

3.0 EXECUTION

3.3	**Excavation**	Delete 3.3.1.2 and replace with the following	Connections to existing waterworks systems are to be made by the *Contractor* under the inspection / supervision of the *Contract Administrator* and the City.
3.6	**Surface Restoration**	Delete 3.6.2.4 and replace with the following	Restore lawns with approved topsoil and sod to match existing lawn.
		Delete 3.6.3.1 and replace with the following	Restore surface with a minimum 100 mm of 19 mm granular road base material.
		Delete 3.6.7.5 and replace with the following	Restore Pavement as detailed on Coquitlam Standard Detail Drawing COQ-G4. Temporary patch shall be a minimum thickness of 50 mm thickness. Permanent restoration to existing asphalt thickness (minimum of 75 mm) with a 35 mm key where existing thickness permits. A 50 mm key is required on Arterial and Collector

Roadways. Dry if necessary and paint clean, dry edge with asphalt emulsion (tack coat).

END OF SECTION

1.8 Measurement and Payment

Delete 1.8.4 and replace with the following

Payment under this item will only apply to removal of the components included in this item under a separate operation as shown on the Contract Drawings or as directed by the Contractor Administrator. No payment will be made under this item for removal of these components as part of the operation for common excavation, and such removal will be treated as common excavation.

Payment will be made at the respective unit prices bid in the Schedule of Quantities and Prices and will include all labour, and equipment required to complete the work, including offsite disposal.

Payment for removal of lock blocks will include all labour and equipment required including placement of lock blocks at a new location on Cedar Drive to act as a protection to City Hydrants, BCH Poles etc.

It is the responsibility of the contractor to locate and verify all utilities.

Delete 1.8.5 and replace with the following

Payment for Common Excavation includes:

1. Unless noted in the Schedule of Quantities and Prices as removal in square meters, common excavation will be measured in cubic metres calculated from measurements taken by the Contract Administrator in the areas of excavation for road widening areas.
2. Payment will include provision of polythene sheets for erosion control as directed by QEP and CA.
3. Cross-sections will be taken after clearing and grubbing and after stripping of 150mm of existing topsoil immediately prior to excavation of material to be incorporated into work.
4. Where determined by the Contract Administrator that truck box volume will be used to determine excavation quantities the volume per load shall be determined using 75% of the struck load quantity.

Truck Type	Material Type	Volume (cu.m)
Tandem	ordinary material	7
Tandem	asphalt/concrete/pipe	4
Triaxle	ordinary material	8
Triaxle	asphalt/concrete/pipe	5
Tandem and Pony	ordinary material	11
Tandem and Pony	asphalt/concrete/pipe	7.5
Triaxle and Pony	ordinary material	13
Triaxle and Pony	asphalt/concrete/pipe	9
Tandem and Transfer	ordinary material	19
Tandem and Transfer	asphalt/concrete/pipe	13

5. Contractor to provide truck slips detailing location type of common excavation, time loaded and location of dump site. The slips are to be given to Contract Administrator by the end of shift or Contract Administrator can deny quantities subsequently submitted.
6. Payment for on-site reuse includes re-shaping, grading, adjustment of moisture content and compaction of the reused material

7. Payment for over-excavation includes deep patch repair, supply, placement and compaction of 75mm clear crushed. Extent to be determined by the Contract Administrator after proof rolling by the Contractor.

Payment will be made at the respective unit prices bid in the Schedule of Quantities and Prices and will include all labour, and equipment required to complete the work, including offsite disposal. It is the responsibility of the contractor to locate and verify all utilities.

Delete 1.8.10 and replace with the following

Payment for replacement of areas of unsuitable granular base, granular subbase or sub-grade revealed during excavation will include excavation with off-site disposal, supply & compaction of granular base material (75 mm minus unless otherwise specified), and all remedial work required to achieve a suitable base/sub grade. Payment with be based on the cubic metre volume removed.

Add 1.8.14

Payment for lightweight fill (pumice) shall include transport, temporary stockpiling, dewatering of excavation, supply and installation of geotextile, placement and compaction, spreading and grading to the limits as shown on the Contract Drawings.

Pumice to be wrapped all around using non-woven geotextile such as Nilex 4551 or approved equivalent, with 500mm overlap.

Payment will be made on cubic metre basis, based on neat line survey of the excavated area.

For the lightweight fill, following specifications will be followed:

- Lightweight pumice aggregate shall consist of durable red vesicular basalt or approved equivalent.
- White pumice shall not be used as lightweight fill for this project.
- Contractor shall submit proposed pumice aggregate source and associated properties for review and approval by the Consultant prior to delivery to the site.

Add 1.8.15

Payment for knotweed removal and disposal at the City lot on Gilleys Trail will include all ESC measures and silt fencing installation around the perimeter of the stockpile immediately after the material is placed on the polysheeting. Payment includes containing any soil movement due to erosion related to rain events and installation of silt fencing as per manufacturer's specification, facing uphill with at least 6 inches of the fence installed below the surface grade. All excavation will be carried out under the supervision of Diamond Head Consultants.

Add 1.8.16

Regrading of embankment side slope would include removal of and stockpiling of sloughed top soil, regrading of side slope and filling depressions using soil available on site, compaction, complete. Payment includes checking and protecting the irrigation pipes and sprinklers. Payment will be made based on surface area regraded. Payment includes working on embankment top to avoid moving machinery on Coho gravel placed on the channel bottom.

2.0 PRODUCTS

2.2 Specified Materials Delete 2.2.1.3 Pit Run Sand

Delete 2.2.1.4 River Sand

Delete 2.2.2

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.1 and replace with the following	Measurement for granular subbase of variable thickness will be for actual quantity placed based on weigh tickets provided to Contract Administrator as loads are delivered.
		Delete 1.4.2 and replace with the following	Measurement for granular subbase for each specified thickness will be for the actual area placed.
		Delete 1.4.3 and replace with the following	Payment for Subsection 1.4.1 & 1.4.2 above includes supply, placement and compaction of granular subbase material, adjustment of moisture content, and boning to establish the road cross-section, shall be included in the unit price bid in the Schedule of Quantities and Prices.
		Delete 1.4.4 and replace with the following	Payment for removal of unsuitable subgrade including disposal off-site prior to direct placement of granular subbase will be made under Section 31 24 13 – 1.8.5 Common Excavation.
		Add 1.4.6	Payment for 75mm clear crush gravel includes supply, placement and compaction of granular subbase material, adjustment of moisture content, and boning to establish the cross-section, shall be included in the unit price bid in the Schedule of Quantities and Prices.
2.0	**PRODUCTS**		
2.1	**Specified Materials**	Delete	2.1.1.1: Select Granular Subbase 2.1.1.2: 75 mm Pit Run Gravel 2.1.1.4: Pit Run Sand 2.1.1.5: Approved Native Material 2.1.1.7: River Sand

END OF SECTION

1.4	**Measurement and Payment**	Delete 1.4.1 and replace with the following	Measurement for granular base of variable thickness will be for actual quantity placed based on weigh tickets provided to Contract Administrator as loads are delivered.
		Delete 1.4.2 and replace with the following	Measurement for granular base for each specified thickness will be for the actual area placed.
		Delete 1.4.3 and replace with the following	Payment for Subsection 1.4.1 & 1.4.2 above includes supply, placement and compaction of granular base material, adjustment of moisture content, and boning to establish the road cross-section, shall be included in the unit price bid in the Schedule of Quantities and Prices.
		Delete 1.4.4 and replace with the following	Payment for removal of unsuitable subgrade including disposal off-site prior to direct placement of granular subbase will be made under Section 31 24 13 – 1.8.5 Common Excavation.
2.0	**PRODUCTS**		
2.1	**Granular Base**	Add 2.1.1.3	25 mm minus crushed gravel conforming to the gradation specifications for Collector/Arterial Roads under Section 31 05 17S – 2.10.3.
3.0	**EXECUTION**		
3.5	**Proof Rolling**	Delete 3.5.1 and replace with the following	For proof rolling, use fully loaded single axle, to 80 KN (18, 000 lb) minimum, dump truck.
		Add 3.5.7	Prior to paving with asphalt concrete, the base surface shall be checked by the *Contract Administrator* and the City, for deflections utilizing a Benkelman Beam, in order to insure that the final rebound requirements can be obtained with the asphalt pavement. In the event that such deflection are in excess of those required to produce the final standards, than the base shall be adequately strengthened by additional gravel or asphalt concrete to insure that final deflections as follows are not exceeded. The Benkelman spring rebound value of the completed pavement surface shall not at any point exceed 0.75 mm for arterial industrial roads and lanes, 1.15 mm for collector roads, and 1.5 mm for local roads and lanes as determined in the procedures outlined in the Transportation Association of Canada publication "Pavement Management Guide."

END OF SECTION

1.5	**Measurement and Payment**	Delete 1.5.1 and replace with the following	Payment for asphalt tack coat will be for surface area of all portions of existing pavement to be tack coated in preparation for placement of hot mix asphaltic concrete.
		Add 1.5.2	Pavement surface cleaning, as per section 32 01 11, and all other work incidental to the application of tack coat is deemed to be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.
3.0	**EXECUTION**		
3.2	**Application**	Add to 3.2.3	Asphalt tack coat to be applied using a truck mounted spray bar unless otherwise approved by the *Contract Administrator* and the City. Contractor shall demonstrate, to the *Contract Administrator* and the City, prior to application that all spray nozzles are operational and providing a consistent application.

END OF SECTION

1.0 GENERAL

1.4	**Submission of Mix Design**	Delete 1.4.1 and replace with the following	Submit asphalt concrete mix design, including RAP content and trial mix test results to Contract Administrator for review at least two weeks prior to commencing work.
1.5	**Measurement and Payment**	Delete 1.5.1 and replace with the following	Payment for asphaltic concrete paving includes all construction joint preparation, asphaltic surface milling and key to tie into existing asphalt, saw cutting, supply and placing of the asphaltic concrete, compaction and cleaning frames, covers and lids of castings affected and taped temporary pavement markings. Measurement for asphaltic concrete paving for the specified design mixes will be made at the respective unit prices bid in the Schedule of Quantities and Prices and incorporated into Work will be asphalt concrete actually based on weigh tickets provided to the Contract Administrator as loads are delivered. The contractor will not receive any additional compensation above the respective unit prices bid in the Schedule of Quantities and Prices for Hand Work, Special Equipment & Machinery to complete the Hot Mix Asphaltic Paving Work as shown on the Contract Drawings or as directed by the Contract Administrator. For measurement and payment purposes, Contract Administrator may calculate payment on actual area paved to the thickness specified in in the Schedule of Quantities and Prices and as shown on the Contract Drawings. **MILLED AREAS MUST BE PAVED WITHIN 48 HOURS (2 DAYS).**
		Delete 1.5.3 and replace with the following	Payment for asphaltic concrete sidewalks, pathways, driveways, infill strips paving, and stamped colored asphalt includes all construction joint preparation, saw cutting, supply and placing of the asphaltic concrete, compaction and cleaning frames, covers and lids of castings affected. Payment includes relocation of lock block and boulder to accommodate asphaltic concrete sidewalk. Measurement for asphaltic concrete paving for the specified design mixes for will be made at the respective unit prices bid in the Schedule of Quantities and Prices and incorporated into Work will be asphalt concrete actually based on weigh tickets provided to the Contract Administrator as loads are delivered. Payment for this item includes all applicable materials and work described in 1.5.1. Work includes all necessary adjustments on site during construction to achieve proper tie-in to existing driveways as directed by Contract Administrator. Adjustments performed under this section shall be incidental to payment for work described in other Sections
1.6	**Inspection and Testing**	Add 1.6.3	Test cores will be taken by the *Contract Administrator* in the areas of new paving and will include cores along construction joints to ensure compliance with the required design and compaction.

2.0	**PRODUCTS**		
2.1	**Materials**	Add 2.1.2.1	Usage of recycled asphalt shingles will not be permitted.
		Add 2.1.2.2	Usage of softening agents, rejuvenators, or recycling agents will not be permitted.
2.2	**Mix Design**	Delete 2.2.2 and replace with the following	Mix may contain up to a maximum of 15 % by mass of RAP for Upper Course Asphalt and 20 % by mass of RAP for Lower Course Asphalt without a special mix design. The *Contract Administrator* and the City may approve higher proportion of RAP if *Contractor* demonstrates ability to produce mix meeting requirements of the specification.
		Delete 2.2.3.2 Marshall Stability and replace with the following	Marshall Stability at 60°C for both lower and upper courses to be 10 KN min.
3.0	**EXECUTION**		
3.3	**Preparation**	Delete 3.3.3 and replace with the following	The *Contractor* is responsible for adjusting all utility manhole frames and valve boxes, belonging to Coquitlam and/or other agencies that are affected by the road works. All adjustments to utilities must be completed to the satisfaction of the utility owner. Utility adjustment within the paved surface will be considered incidental to the *Work* unless otherwise noted in the *Contract Documents*. The *Contractor* should note that certain utility owners may decide to complete their own adjustments. The *Contractor* will be required to cooperate with any utility company providing their own adjustments. The *Contractor* shall be responsible to contact the appropriate utility company with in minimum of seventy two (72) hours of the work. No adjustment shall be made without the written approval of the utility company. <u>All manholes must be vertically adjusted a minimum of twenty four (24) hours prior to paving.</u> The use of riser rings for adjusting manhole frames and value boxes will not be permitted.
3.7	**Joints**	Delete 3.7.5 and replace with the following	Construct butt joints at locations as shown on the *Contract Drawing* and as directed in the field by the *Contract Administrator* and the City.

END OF SECTION

1.0 GENERAL

1.2	**Scope**	Delete 1.2.1 and replace with the following	Pavement Markings: Miscellaneous taped temporary and permanent pavement markings including pedestrian crosswalk, merge and diverge markings, stop lines, solid and broken line road lane markings including edge lines of merge and diverge markings, bike symbols, etc. to be provided as shown on the *Contract Drawing*.
1.5	**Measurement and Payment**	Delete 1.5.2 and replace with the following	All permanent markings shall be marked with thermoplastic manufactured by LAFRENTZ ROAD MARKINGS or approved equal, unless shown otherwise in the Schedule of Quantities and Prices.
		Delete 1.5.3 and replace with the following	The lump sum payment for permanent thermoplastic pavement markings covers removal of existing markings, supplying all materials and completing all the permanent thermoplastic pavement markings necessary to provide markings as shown on the Contract Drawings. NOTE: PAYMENT FOR PERMANENT THERMOPOPLASTIC PAVEMENT MARKINGS WILL NOT BE MADE UNTIL ALL TEMPORARY PAVEMENT MARKINGS AND REFLECTIVE DEVICES HAVE BEEN REMOVED.
		Delete 1.5.4 and replace with the following	Payment for signage includes all sign poles, bases, sleeves, sign relocations and sign installations (complete). The City will supply signs to supplement existing signs as required. Payment includes all labor, materials and incidentals to complete the work. 1. Installation of each new sign pole, cap, sleeve and trapezoidal base includes all costs to supply all materials, labour and equipment and incidentals, as shown on Standard Detail Drawings SS-E11.1 & SS-E11.2, necessary to the install sign structure as shown on the Contract Drawings and as directed by the Contract Administrator. 2. Installation of each new sign pole, cap, sleeve, galvanized steel bracket for no post barrier, as per MOT Drawing # SP635-3.8.3, includes all costs to supply all materials, labour and equipment and incidentals necessary to the sign structure as shown on the Contract Drawings and as directed by the Contract Administrator. 3. The unit price payment is for each city supplied aluminum sign installed on a sign pole includes sign mount clamps & all costs to supply all materials, labour and equipment and incidentals necessary to install each sign as directed by the Contract Administrator. 4. Installation of each aluminum sign on a lamp standard pole or sign pole includes sign mount clamps and all costs to supply all materials, labour and equipment and incidentals necessary to install each sign as directed by the Contract Administrator.
		Add 1.5.5	Payment for the installation of Snowplowable Raised Pavement Markers (RPM) will include all labour, equipment, and materials required to install RPMs to manufacturer's specifications.

2.0 PRODUCTS

2.1	**Materials**	Delete 2.1.1 and replace with the following	All permanent paint markings shall be marked with thermoplastic manufactured by LAFRENTZ Road Markings.

		Delete 2.1.6 and replace with the following	Pavement Markings:
		Delete 2.1.7 and replace with the following	Thermoplastic material .1 Material composition shall be at the discretion of the manufacturer subject to the approval of the Contract Administrator and the City. Each formulation shall be identified by a code number. .2 No retained water when tested by ASTM D-570. .3 Specific gravity of the supplied product shall be within 3 % of that specified for the selected formulation. .4 Material shall not deteriorate upon contact with deicing chemicals, gasoline, diesel fuel or grease dropped by traffic. .5 Material shall not break down, deteriorate, scorch or discolour, if held within the application temperature range specified by the manufacturer for a period of four hours and it must be able to be reheated from room temperature to the application temperature four (4) times without showing any of these detrimental effects. .6 When applied at the temperature recommended by the manufacturer and at a film thickness of 2 to 4 mm, the material shall set solid and show no tracking under traffic after elapsed times as follows: .1 Two (2) minutes at an air temperature of 10° C, relative humidity less than 75 %, and road surface temperature from 10° C to 20° C. .2 Five (5) minutes at an air temperature of 32° C, relative humidity less than 75 %, and road surface temperature from 35° C to 50° C. .3 The drying time under conditions intermediate between the two air temperatures shall be interpolated using a straight line model. .7 The quantity, type, and gradation of the component reflecting glass spheres premixed in the thermoplastic material shall be at the discretion of the manufacturer, but shall provide retroreflection levels specified below.
3.0	**EXECUTION**		
3.3	**Application**	Add to 3.3.1.3	Temporary raised pavement markings (TRPMs) are to be provided on all multi-lane roadways as directed by the *Contract Administrator* and the City.
		Delete 3.3.3.3 and replace with the following	Thermoplastic material shall be heated in the melter to a temperature of 382 °F.

END OF SECTION

1.5	**Measurement and Payment**	ADD 1.5.5	Payment under this item will include supply and installation of single rail trail fence as per COQ-L5A complete with Chain.

END OF SECTION

1.0 GENERAL

.1 Section 32 84 23 refers to those portions of the work that are unique to the complete installation of a fully automatic underground irrigation system, including all necessary preparatory work and all electrical, wiring and plumbing connections, and maintenance work during the guarantee period. This section must be referenced and interpreted simultaneously with all sections pertinent to the works described herein.

.2 The scope of work involves the supply and installation of sleeves, mainline, lateral lines, control zone valves, dripline, spray heads, root watering systems, controller enclosure, controller, and all related items necessary to provide a properly operating automatic irrigation system to distribute water in a way that adequately maintains the landscape while conserving and protecting water resources.

.3 The scope of work involves maintenance of irrigation system.

1.1 Related Work

.1 Excavation, Trenching and Backfilling 31 23 01

.2 Aggregates and Granular Materials 31 05 17

1.2 References

.1 The Canadian Landscape Standard (current edition)

.2 City of Coquitlam Water Meter Specifications (File #: 11-5600- 08/000/2014-1)

.3 City of Coquitlam Supplementary Specifications Master Municipal Construction Documents March 2016 Division 33 Section 22 11 01S Waterworks and details COQ-W2b, COQ-W2e and COQ-W2f.

.4 **Reference Standards:**

.1 ASTM D1248 – High Density Polyethylene (HDPE) Pipe
.2 ASTM D2241 – Poly Vinyl Chloride (PVC) Plastic Pipe (SDR-PR)
.3 ASTM D2564 – Solvent Cement for PVC Pipe and Fittings
.4 CSA B137.0-12 – Thermoplastic Pressure Piping
.5 BC Building Code (Current Edition) Part 7 – Plumbing Services
.6 B.C.W.W.A. Cross Connection Control Manual

1.3 Codes and Regulation

.1 All work shall be installed in accordance with the requirements of local and applicable provincial and federal regulations. Any work shown on the drawings or described in the specifications which is at variance with the regulations shall be changed to comply with the requisite authority at no cost to the Owner.

.2 Workers' Compensation Board regulations shall be followed.

1.4 Permits and Fees

.1 The Contractor shall be responsible for obtaining all permits and licenses applicable to the work to be done and shall include costs for such permits and licenses in the tender price.

.2 Provide Contract Administrator with signed and approved copies of all required permits, including the following:

.1 Backflow test report

1.5 Contract Drawings

.1 Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Do not scale drawings.

1.6 Quality Assurance

.1 The trade contractor performing this work shall be a "Certified Irrigation Contractor" having met the certification standards established by The Irrigation Industry Association of British Columbia, and having experienced, trained and insured personnel qualified for the scope of work.

.2 A written guarantee of the installed irrigation system shall be provided to the Owner covering workmanship and materials for a minimum of one (1) year from the date of substantial completion. The contractor shall warranty maintenance on the system for a minimum of one (1) year, including but not limited to spring start-up, adjustments and maintenance operations as required, and winterization.

.3 Manufactured products, including but not limited to irrigation heads, quick couplers, controllers, valve boxes and valves, will be warranted as per the manufacturer's standard warranty period or a minimum of one (1) year, whichever is greater.

.4 If the design involves High Density Polyethylene Pipe (HDPE), the Contractor shall be certified in High Density Polyethylene Butt-Fusion as certified by the British Columbia Institute of Technology or approved equivalent.

.5 The double check valve assembly and meter shall be installed and tested by a certified and licensed backflow tester with B.C.W.W.A.

.6 All electrical components or products specified or used in construction of the proposed irrigation system must be CSA approved and installed in accordance with all local, provincial, and national electrical codes.

.7 All materials to be new and without flaws.

.8 The completed irrigation system is to efficiently and uniformly irrigate all areas and perform as required by these specifications.

1.7 Submittals

.1 The Contractor shall submit evidence of project personnel having certification in High Density Polyethylene Butt-Fusion prior to commencing the work.

.2 The Contractor shall submit prior to construction a copy of their Low- Voltage Field Safety Representative certificate and their backflow tester certificate.

.3 The Contractor shall submit shop drawings, product literature, and specifications for approval by the Owners Representative prior to construction.

.4 A suitably scaled as-built drawing shall be submitted, preferably in AutoCAD 2008 or newer format along with three (3) printed copies of the as-built. Retain a qualified survey instrument operator to record exact location of all irrigation components installed, including but not limited to the controller cabinet, master valve, mainline, sleeves, control zone valves, main water connection, blow-out fittings, pipe drains, lateral end flush valves, soil moisture sensors, sprinklers and any other similar features. Show all other deviations from the irrigation design drawing provided to the Contractor. All components of the irrigation system shall be shown as installed, with clear measurements from an identifiable reference point.

.5 The as-built drawing shall be submitted prior to issue of Substantial Completion. The Contractor shall maintain the as-built record drawing throughout the maintenance and warranty period and issue a revised As-Built Irrigation Drawing at Final Acceptance if any changes are made. The as-built drawings shall be certified by the landscape subcontractor as being an accurate record of installation.

.6 Operation and Maintenance Manuals:

.1 Prepare and deliver to the Owner within five (5) calendar days prior to completion of construction two (2) copies of the following information in 3-ring binders:

.2 Parts sheets on every material and component installed under this Contract.

.3 Product warranty documentation for all controllers, meters, backflows, valves, filters, sensors, and related irrigation components. Date the warranties with the date of Substantial Performance.

.4 Guarantee statements.

.5 Complete operating and maintenance instruction on all major equipment.

.6 Winterization and spring start-up procedures.

.7 Chart of approximate watering times for peak and shoulder season showing all proposed run times for each zone relative to differing precipitation rates and water requirements.

.8 Copies of Backflow Test Report.

.9 One (1) full sized printed copy of the as-built, two (2) 11" x 17" sized printed copies of the as-built on rip-proof and water proof paper.

.10 A disc or portable memory stick with the .dwg file and .pdf file of the as-built.

1.8 Site Conditions

.1 Verify the existence and location of all underground utilities and services prior to commencement of the work.

.2 Consult with the Contract Administrator to adjust the design, if necessary, to suit existing site conditions and grades prior to commencement of the work.

.3 Ensure sequencing of this work is carried out in coordination with the work of other trades. It is essential to coordinate the installation of sleeves under hard surfaces and irrigation piping through open tree soil trenches to ensure their installation is completed when the work area accessible.

.4 Protect from damage existing landscape features, plant material, structures, irrigation work in progress, and the work of other trades.

1.9 Substitutions

.1 Where materials are specified by brand name and model number, such specifications shall be deemed to facilitate a description of the materials and material quality and shall establish a standard for performance and quality against which proposed substitutes shall be evaluated.

.2 Substitution requests shall not be considered unless submitted in writing with sufficient descriptive literature and product samples to permit product comparison.

.3 All product substitutions shall be of equal or greater performance, value and water efficiency than the original design. All proposed sprinkler substitutions must be accompanied with verifiable water efficiency performance data provided by the manufacturer or an independent industry source such as the Centre for Irrigation Technology (CIT), Fresno.

.4 Alternate materials shall match the specified materials in performance, flow, and pressure loss so as not to compromise the intent of the design.

.5 The written approval of the Contract Administrator is required to the use of materials that are different from those shown in the design. Materials installed which have not been pre-approved by the Contract Administrator are subject to removal and replacement with approved materials at the Contractor's expense.

.6 Shop Drawings or irrigation system are required for any and all aspects of the irrigation system not included in the Drawings. This includes but is not limited to:

.1 Revisions to irrigation system design not previously addressed in Contract Documents, including revisions to irrigation system design which markedly alter the original design, as determined by the Contract Administrator

.2 Installation details for irrigation components not addressed in Contract Documents

.3 Details required by Contract Administrator for review proposed substitutes

.4 Tasks identified in project specifications as requiring a Shop Drawing

.7 Submit Shop Drawing to Contract Administrator for review, comment, and approval or rejection.

1.10 Notification of Consultant

.1 Report to the Contract Administrator, in writing, any conditions or defects encountered on the site during or prior to construction upon which the work of this section depends and which may adversely affect its performance.

.2 Notify the Contract Administrator and obtain approvals for inspection and testing of irrigation system as specified in this section. Provide the Contract Administrator and Owner minimum 3-days' notice prior to required inspections or meetings.

1.11 Measurement and Payment

Payment for all work performed under this section would include:

.1 Supply and installation of irrigation control system. The work includes: permits & fees, supply, installation, testing, programming, and adjustment of irrigation system controller, electrical conduits, controller cabinets, vaults, valve boxes, lids, fittings, wire, excavation, trenching, backfill, and restoration, and all incidentals necessary for the proper installation and operation of a complete irrigation control system.

.2 Supply and installation of pipes, valves, sprinklers and dripline: the work includes, but is not limited to: supply, installation, testing and adjustment of irrigation pipe, sleeves and conduit, zone control valves, drip control zone kits, electric control wire, common wire, flow sensor wire and spare wires, drain valves, isolation valves, pressure regulators, swing joint assemblies, sprinklers, bubblers, emitters, dripline and root watering systems, air relief valves, flush valves, fittings, vaults, valve boxes and lids, excavation, trenching, backfill and restoration, all incidentals necessary for the proper installation and operation of a complete irrigation system.

.3 Supply all labour and materials necessary for adjustment of existing systems to meet approval of Contractor Administrator.

.4 Payment for record drawings and operating manual will be incidental to the work under this section.

.5 Payment for irrigation tests, inspections, maintenance, winterizations, and spring start-ups during warranty period will be incidental to the work under this section.

1.12 Tests and Inspections

.1 System installation inspections shall be held on a regular basis.

.2 In addition to coordinating the inspection schedule, the irrigation contractor shall, in the presence of the Irrigation Consultant conduct the following tests and inspections:

.1 Inspection of mainline and sand bedding prior to burial.
.2 Pressure tests of mainline.
.3 Layout inspection and operation test of subsurface dripline prior to burial.
.4 Coverage and operation tests.
.5 System test.
.6 HDPE pipe strap test.

.3 Keep work uncovered and accessible until successful completion of inspection or test.

.4 Conduct all inspections and tests in presence of Contract Administrator and request Contract Administrator issue signed report to Contractor within three days regarding each test result. Request attendance of Contract Administrator for proposed inspection or test at least three days prior to proposed inspection or test.

1.13 Backflow Assembly Test

.1 Conduct backflow prevention assembly test as BC Water Works Association standard using qualified personnel.

1.14 Mainline Pressure Test

.1 Perform mainline pressure test to identify potential leaks and ensure mainline is able to operate at design pressure and maintain pressure.

.2 Conduct mainline pressure test prior to backfilling of mainline.

.3 Fill mainline with water and expel all air from pipe. Maintain water in pipe as follows:

.1 24 hours for PVC mainline
.2 3 hours for HDPE mainline (not including set up time)

.4 Subject mainline to hydrostatic pressure of 150psi or twice the optimum design pressure of the mainline and not to exceed 200psi.

.5 Stop supply of make-up water to mainline and record hydrostatic pressure in mainline.

.6 Visually inspect mainline and fittings for leaks.

.7 Record hydrostatic pressure in mainline 3 hours after supply of make- up water stopped.

.8 Determine test result based on difference in recorded pressures at beginning and end of test as follows:

.1 Passed test: Less than 5% difference

.2 Failed test: Great than 5% difference.

.9 Identify source of leak and replace any and all defective material and workmanship as necessary to eliminate leak.

.10 Repeat mainline pressure test and make replacements as necessary until a passed result is achieved.

1.15 System Coverage and Operation Test

.1 Conduct coverage and operation test after installation and operation of complete irrigation system and prior to issuance of Certificate of Substantial Performance:

.1 Head spacing does not exceed the distances shown on Contract Drawings

.2 Where applicable, irrigation piping should be installed to follow the contours of the land in an effort to minimize low head drainage situations.

.3 Heads, boxes, vaults and trenches are at specified elevation relevant to finished grade and not subject to settlement or lifting.

.2 Conduct operational tests to verify that:

.1 Controller can be programmed manually on site and remotely via Owner's central control system.

.2 Controller can send and receive communication with Owner's central control system 10 consecutive times without a missed communication.

.3 Controller responds to flow sensor.

.4 Operating pressure is within design parameters.

.5 Each zone can be operated automatically and in succession via programmed controller.

.6 Performance provides head to head coverage.

.7 There is no overspray onto different control zones, hard surfaces or other improvements.

1.16 Dripline Emitter Test

.1 Perform inspection and testing of dripline/emitter manifold and lines to identify potential leaks and confirm manifold, driplines and emitters are able to operate at design pressure. Conduct inspection and testing prior to backfilling of manifold, driplines or emitters.

.2 Fill manifold and lines with water at operating pressure and maintain pressure for 1 hour. Visually inspect manifold, driplines and fittings for leaks. Confirm that emitters are functioning correctly. Identify sources of leaks and replace any and all defective materials and workmanship as necessary to eliminate leak.

.3 Repeat inspection and testing and make replacements as necessary until no further leaks are identified.

1.17 HDPE Pipe Strap Test

.1 Conduct HDPE pipe strap test at least 1 hour after fusion weld has been made prior to backfilling of HDPE pipe on those fusion welds where, upon visual or tactile inspection, the bead does not roll back properly or is not consistent in height or width.

.2 HDPE pipe strap consists of:

.1 Cut fusion weld from pipe, allowing 200mm on either side of weld to work with.

.2 Cut pipe lengthways through fusion weld to create a stap 1” wide.

.3 Bend strap back on itself.

.4 If weld breaks repeat test on another fusion weld, chosen by Contract Administrator. If second fusion weld fails then all welds become suspect and the HDPE pipe cannot be installed until the reason for the fusion joint failures is determined.

.5 If fusion weld does not break then the weld is acceptable and no further testing of similar welds is required.

.6 Replace or repair tested pipe strap.

1.18 Vault Drainage Test

.1 Conduct vault drainage test when vault is installed and backfilled and prior to installation of backflow prevention device and water supply line in vault.

.2 1.19.2 Fill point of connection vault with water to a depth of 12” and leave water to drain.

.3 Determine test result based on time required for water to drain below finish grade of drain rock in bottom of vault:

.1 Passed test: 1 hour or less.

.2 Failed test: greater than 1 hour.

2.0 PRODUCTS

2.1 Vault and Lid

.1 Acceptable vaults and matching lids for point of connection equipment are dependent on service size and include the following:

.1 ¾": as per drawings
.2 1" to 2": as per drawings
.3 2 ½" to 3": as per drawings

.2 Lids to have recessed hinges and locking hardware.

2.2 Vault Drain

.1 Perforated Schedule 40 PVC pipe, 4" diameter with threaded inlet cover having 13mm grated openings.

2.3 Backflow Prevention Assembly

.1 Acceptable double check valve assemblies are :

.1 Watts Series 007 Double Check Valve Assemblies
.2 Apollo 4A-100 Double Check Valve Assemblies

2.4 Water Service and Meter

.1 Unless already installed or otherwise required by the water utility having jurisdiction over the site provide a metered water service, including but not limited to:

.1 Permit
.2 Backflow prevention assembly

.2 Supply and install water meter in accordance with requirements of water utility.

.3 Conform size of water meter to mainline diameter and allow for minimal pressure losses.

2.5 Flow Sensors

.1 Flow sensors impellors to be PVC, sized to match system low and high flows. Acceptable flow sensors are:

.1 Toro TFS-050
.2 Toro TFS-075
.3 Toro TFS-100
.4 Toro TFS-150
.5 Toro TFS-200
.6 Toro TFS-300
.7 Toro TFS-400

.2 Acceptable wires for flow sensor shall be shielded, direct burial communication cable and includes the following:

.1 Regency Wire PE-39 Communication Cable
.2 Approved equal

2.6 Master Valve

.1 Acceptable master valves are as follows:

.1 Rain Bird PEB Series

.2 Ensure master valve is sized to maximum and minimum flow parameters shown on Contract Drawings.

2.7 Pressure Reducing Valve

.1 Acceptable water pressure reducing valves are Watts Series 25AUB-Z3

2.8 Blow-Out Assembly

.1 Blowout assembly to be 1" ball valve with plug and swing joint assembly.

2.9 Irrigation Controller

.1 Acceptable irrigation controllers include the following:

.1 Toro Sentinel V3 Cellular Controller assembly with cellular modem. Updated Toro Sentinel Controller version to be used if available. Cellular modem selection to be approved by City of Coquitlam

.2 Rain Bird TBOS-BT if on-site power is not available.

2.10 Control Cabinet

.1 Acceptable controller cabinets are as follows:

.1 Toro Sentinel Stainless Steel Wall Mount enclosure

.2 Toro Sentinel Stainless Steel Pedestal

.3 Or as shown on Contract Drawings.

2.11 Controller to Decoder Communication

.1 Communication between controller and the field decoders at the electric control valves shall be accomplished using the Paige Electric P7350D

.2 Field Decoders (either 1, 2, 4, or 6 station configuration with ability to operate multiple solenoids per station) come pre-addressed.

.3 Decoder to solenoid: UF insulated type 14AWG to 150ft. (twisted improves surge resistance).

2.12 Control Wire

.1 Control wire from irrigation controller to electric control valve to be minimum #14-gauge, direct burial, type TWU-40 wire. Control wire to be any colour other than white, blue, purple or red.

.2 Common wire from irrigation controller to electric control valve to be minimum #12-gauge direct burial, type TWU-40 wire. Common wire to be white in colour.

.3 Master valve wire from the controller to valve to be minimum #14-gauge direct burial, type TWU-40 wire. Wire to be red in colour.

.4 Spare control wire to be blue in colour.

.5 Spare common wire to be white in colour.

.6 All connectors to be new, two-step, CSA approved for the water tight applications and assembled according to the manufacturer's recommendations.

2.13 Two-Wire Conductor

.1 Communication between controller and the field decoders at the electric control valves shall be accomplished using the Paige Electric P7350D

.2 Single conductor spare decoder wire shall be CSA approved #14 AWG Blue.

.3 All control wire installed shall use a Polyethylene outer jacket.

.4 All connectors to be new, two-step, CSA approved for the water tight applications and assembled according to the manufacturer's recommendations.

2.14 Grounding and Bonding

.1 Ground assembly consists of CSA and BC Electrical Code endorsed products per irrigation controller manufacturer's recommendations for grounding.

2.15 Electrical Products

.1 All electrical products shall be CSA approved and bear the CSA label. Alternatively, where a product does not bear the required CSA label, it shall be approved in writing, by the authority having jurisdiction.

.2 Wire conduit shall be Grey PVC DB2 non-metallic electric conduit as shown on drawings, minimum 2" diameter.

2.16 Polyvinyl Chloride (PVC) Pipe

.1 Conform to CSA B137.3-93.

.2 New condition, extruded from virgin, high impact materials, solvent weldable with belled ends, continually and permanently marked showing manufacturer's name, material, size, and pressure rating.

.3 PVC pipe to be as follows:

.1 Class 200 PVC pipe for pipe sizes ¾" to 4" in diameter.

2.17 Low Density Polyethylene Pipe

.1 New condition CSA Series 100, LDPE in new condition, extruded from virgin materials, continually and permanently marked showing manufacturers name, material, size, and pressure rating

2.18 High Density Polyethylene Pipe

.1 New condition CSA Approved, extruded from virgin materials, continually and permanently marked showing manufacturer's name, materials, size, and pressure rating.

.2 Material to be listed by the Canadian Standards Association (CSA) and Plastic Pipe Institute (PPI) as a PE-3408 resin with a hydrostatic design basis (HDB) of 1600psi for water at 23ºC. Material to comply with ASTM D-1248 as a Type III Class C, Category 5, Grade P34 material and with ASTM D-3350 as a 345434C cell material

.3 Acceptable HDPE pipe is dependent on operating pressure and to have Standard Density Ratios (SDR) as follows:

.1 Max. pressure up to 100psi: SDR 17.0

.2 Max. pressure exceeding 100psi: SDR 11.0

2.19 Sleeving

.1 Schedule 40 PVC for irrigation sleeve in bored hole or under hard surface

.2 Irrigation sleeve diameter to be minimum 2" or twice the diameter or main or lateral line running through it, whichever is greater.

2.20 Valve Boxes

.1 Irrigation valve boxes are to be as follows:

.1 Rain Bird VB Series Valve Boxes

.2 Valve box and matching T Cover Lid and extensions to be commercial grade and green in colour.

2.21 Wire splice boxes

.1 Wire splice box and matching lid and extensions to be commercial grade and grey in colour. Wire splice box to have locking lid with stainless steel bolt locking device and appropriate washers.

2.22 Electrical Control Valve

.1 Acceptable electric control valves are:

.1 Rain Bird PEB Series or Toro P-220

.2 Valve selection to be confirmed by City of Coquitlam Park Operations staff on a per project basis

.3 Size electric control valve in accordance with valve manufacturer's recommendations for the design flow.

.4 Valve shall a sch 80 pvc true union ball valve upstream of each 1" valve. If valve is larger, then install approved gate valve.

2.23 Quick Coupler Valve

.1 Acceptable quick coupler valves are as follows:

.1 ¾" Rain Bird 3-RC
.2 1" Rain Bird 5-RC

2.24 Gate Valve

.1 Acceptable gate valves include the following:
.1 Red White #280
.2 Toyo #206A

2.25 Drip Zone Kits

.1 Drip zone kit shall be as shown on the drawing.

.2 Drip zone kits shall include one (1) schedule 40 PVC ball valve and filter.

.3 The valve box shall contain maximum of two (2) valves per box.

.4 Acceptable drip zone kits are as follows:

.1 0.3 to 20 GPM: Rain Bird XCZ-100-PRB-COM
.2 15 to 40 GPM: Rain Bird XCZ-150-PRB-COM

2.26 Filters

.1 Rain Bird PRB-QKCHK-100

2.27 Swing Joint Assembly

.1 Acceptable swing joint assemblies for sprinklers flowing up to 8gpm:

.1 Rain Bird SA Series Swing Assembly

.2 For sprinklers flowing greater than 8gpm, use fabricated with three (3) threaded Schedule 40 PVC elbows and one threaded Schedule 80 PVC nipple.

.3 Length of nipple shall be such a length to permit installed head or valve to be set as specified.

.4 Diameter of nipple to match inlet for valve or head shown on Contract Drawings.

2.28 Sprinklers - Sprayheads

.1 Acceptable sprayhead sprinklers are as follows:
.1 Rain Bird 1800-SAM, 1800-PRS, 1800-SAM PRS, 1800-SAM-P45 Series
.2 Rain Bird RD1800 Series Spray Heads

2.29 Sprinklers - Rotors

.1 Acceptable rotors are as follows:

- .1 Rain Bird 5004
- .2 Rain Bird 5004-+-SAM-R Series
- .3 Rain Bird Falcon 6504 Series
- .4 Rain Bird 8005 Series

2.30 Landscape Dripline

.1 Acceptable dripline are as follows:

- .1 Rain Bird XFD On-Surface Dripline
- .2 Rain Bird XFS Sub-Surface Dripline
- .3 Rain Bird XFS-CV Dripline

2.31 Drip Emitters

.1 Rain Bird Xeri bugs, sized as shown on drawing.

2.32 Bubblers

.1 Acceptable bubblers are Rain Bird RWS-B-C-1402 with fabric sleeve.

2.33 Lateral Flush Assembly

.1 Ball valve with street elbow and flexible hose on swing joint assembly complete with 10” round valve box.

2.34 Air Relief Valves

.1 Rain Bird ARV050 Air/Vacuum relief valve.

2.35 Fittings

.1 New condition Schedule 40 PVC conforming to ASTM D-2466-97 standards and of the same material as pipe. Fittings to be designed for solvent welding to PVC pipe except where valves and risers require threaded joints.

.2 Nipples to be threaded Schedule 80 PVC and manufactured from same material as pipe.

.3 At the point where the supply source changes from metal to PVC pipe, the metal end of the pipe must be an FIPT (female) adapter and the PVC fitting a MIPT (male) adapter.

.4 Flange couplers may be used upon approval of Contract Administrator

.5 Fittings for LDPE pipe to be Spears insert fittings complete with stainless steel gear clamps.

.6 Fittings for HDPE pipe to be butt fusion type for end-to-end joints.

.7 SDR rating of HDPE fittings must match the SDR rating of the HDPE pipe specified.

.8 HDPE pipe fittings to be molded or fabricated by the pipe manufacturer. HDPE pipe fittings and flange adapters made by contractors or distributors are prohibited.

.9 Fittings for dripline and drip emitters to compatible with specified dripline or emitter and as recommended by manufacturer.

.10 All pipe and fittings installed in irrigation vault to be Schedule 80 per Drawings.

2.36 Pipe Solvent and Primer

.1 PVC pipe solvent and primer combinations recommended by manufacturer and suitable for use with specified materials and application.

.2 Use solvent and primer as directed by manufacturer. Use only solvent and primer that meets local codes.

.3 The use of wet and dry solvent and primer is prohibited.

2.37 Thrust Block

.1 Thrust blocks to be 20MPa at 28-day strength. Thrust blocks can be either:

.1 Poured in place concrete.
.2 Pre-cast concrete block

2.38 Backfill Material

.1 Native excavated material shall be clean excavated soil, free from organic matter, stones larger than 1", building debris, and other foreign substances.

.2 Sand: pit run sand.

3.0 EXECUTION

3.1 Existing Conditions

.1 Report existing conditions at variance with Contract Drawings to Contract Administrator.

.2 Verify locations of underground utilities prior to commencing excavation and conduct work so to prevent interruption and damage to services and utilities. Make good all damages to same at Contractor's cost.

.3 Verify location of all services in building walls before boring or drilling holes. Make good all damages to same at Contractor's cost.

.4 Protect existing conditions and completed work from disturbance during Work. Make good all damages to same at Contractor's cost.

.5 Adjustments to installation of irrigation system to avoid existing conditions, completed work and utilities will be permitted subject to prior approval by Contract Administrator.

3.2 Layout

.1 Locations of irrigation components shown on plans are schematic in nature. Coordinate actual location of irrigation components with landscaping, building and physical features of site. Confirm proposed changes to location of irrigation components in writing with Contract Administrator prior to installation. Changes that markedly alter the irrigation design in the opinion of the Contract Administrator require submission of Shop Drawings and updated Design Report to the Contract Administrator for their permission to proceed. Record all approved revisions on a marked up set of Contract Drawings.

.2 Layout and stake irrigation system per Contract Drawings to confirm:

.1 Layout is within project boundary and property lines
.2 Site grades are consistent with Contract Drawings
.3 Damage to root system of existing trees is minimized
.4 Installation of irrigation components to be minimum of 1 meter outside the dripline of existing trees.
.5 Minimum horizontal and vertical clearances from electrical and other utilities are met.
.6 Location of all sleeving, mainlines, pedestals, vaults, valve boxes, splice boxes

.3 Excavation for layout:

.1 Excavate to ensure depth and bedding requirements are met.
.2 All excavation is unclassified. Report any material or site

condition that cannot be excavated by normal mechanical or normal means or that may affect excavation to required depth to Contract Administrator prior to excavation.

.3 Identify and recycle all suitable materials recovered during construction.

.4 Remove and dispose of buried debris exposed during excavation, including decommissioned irrigation materials and underground utilities, which may impede the proper installation and operation of irrigation system.

3.3 Vault and Lid

.1 Install vault in location on Contract Drawings or in alternate location approved or directed by Contract Administrator.

.2 Support and brace point of connection components, piping and valves within vault using adjustable aluminum pipe stands complete with riser, pipe clamps, base plate and galvanized or stainless-steel fittings in the quantity per service size indicated as follows:

.1 ¾": 2 supports
.2 1" to 2": 3 supports
.3 2 ½" to 3": 3 supports per vault

.3 Use Schedule 80 Pipe for all inside vault and extend outside the vault a minimum of 12" beyond vault. Make union of Schedule 80 pipe with other pipe in valve box or vault using specified fitting.

.4 Make connections of PVC pipe and metal pipe using male threads on PVC pipe and female threads on metal pipe.

.5 Install vault drain and connect to drain pit, dry well, manhole or catch basin.

3.4 Backflow Prevention Device

.1 Install Double Check Valve Assembly (DCVA) in lockable concrete vault or a locked mechanical room, per Drawings.

.2 Install backflow prevention assembly in accordance with all applicable codes and bylaws and in accordance with the current Cross Connection Control Manual Accepted Procedure and Practice (AWWA).

.3 Support backflow prevention assembly with specified supports per manufacturer's recommendations for locations of the support points.

3.5 Irrigation Controller

.1 Install irrigation controller in cabinet as per Contract Drawings.

.2 Coordinate controller installation with that of other electrical components.

.3 Install controller and wiring in accordance with local, provincial and national electrical codes.

.4 Install communication components per manufacturer's recommendations and establish communication between controller and Owner's Central Control System, including relays or boosters as necessary.

.5 Prior to issuance of Certificate of Substantial Performance request irrigation program from Contract Administrator and set controller program accordingly.

3.6 Controller Cabinet

.1 Install controller cabinet in location shown on Contract Drawings or in alternate location approved or directed by Contract Administrator.

.2 Orient alignment of controller cabinet as approved by Contract Administrator to provide optimal observation of irrigation system in operation.

.3 Install controller cabinet using a poured in place concrete pad mount.

.4 Provide electrical service to controller cabinet as shown in Contract Drawings.

3.7 Flow Sensor

.1 Install flow sensor in location specified by Drawings.

.2 Flow sensor wire to run continuously, with no splices, between flow sensor and irrigation controller.

.3 There must be free, unrestricted pipe for at least 10x the pipe's diameter upstream and 5x the pipe's diameter downstream of the tee.

.4 Follow manufacturer's recommendations for installation of flow sensor and wiring.

3.8 Control Wire

.1 Install control wire per code by qualified personnel employed by the company holding the electrical permit.

.2 Bury control wire per applicable code and in no case above the bottom side of parallel pipe.

.3 Bed control wire in sand with minimum 2" sand around control wire. Where control wire is in same trench as pipe, place wire beside pipe with horizontal clearance of a minimum of 2" and in accordance with BC Electrical Code depth.

.4 Bundle multiple lengths of wire in same trench or conduit with ties at maximum 3.0m intervals.

.5 Install wire with 24" length of coiled slack at all changes of direction, in wire splice boxes and at connections to controlled components.

.6 Identify all control wires entering controller cabinet with permanent label or tag indicating zone number of valve operated by each control wire.

.7 Maintain consistent wire colour through wire splice box.

.8 Minimize wire splices. Where wire splices are unavoidable make splice only in wire splice box using specified connector.

.9 Identify spliced wire with permanent label or tag indicating zone number of spliced control valve.

.10 Where specified on Contract Drawings, install extra control wire to wire splice box. Provide 24" length of coiled slack of each wire end in wire splice box. Identify extra control wire as 'extra' wire with permanent label or tag.

3.9 Wire Splice Box

.1 Locate wire splice box in planting bed where possible and locate for ease of access, maintenance, and testing.

.2 Install wire splice box per Drawings and arrange in a neat and orderly manner.

.3 Do not install valves in wire splice box.

.4 Wire splice box to be a Rain Bird 10" round valve box.

3.10 Grounding and Bonding

.1 Install ground assembly in location shown on Contract Drawings or the revised location approved by the Contract Administrator.

.2 Use the rod, plate and wire configuration as recommended by the manufacturer of irrigation controller and per BC Electrical Code.

3.11 Sleeving

.1 Install irrigation sleeves in locations shown on Contract Drawings.

.2 Install irrigation sleeve to depth as follows:

.1 Mainline Piping
- .1 24" below walkways
- .2 36" below driveways, roads and plazas

.2 Lateral Piping
- .1 12" below walkways
- .2 24" below driveways, roads and plazas

.3 Install sleeves to extend 1.0m past edge of hard surface into soft landscape surface.

.4 Cap sleeve with removable plug or cover. Maintain plug in sleeve until such time as pipe or wire is ready to be installed.

.5 Bed sleeve as follows:

- .1 Under walkways, 4" of sand placed all around
- .2 Under driveways, roads and plazas, compacted base aggregate all around per materials shown on Drawings.

.6 Bury a piece of detectable metal on top of each end of sleeve to enable location of sleeve end by metal detector after burial.

.7 Stake location of each end of sleeve prior to backfilling such that top of stake is 12" above finished grade and maintain. Label exposed end of stake with the word "sleeve".

.8 Record location of sleeve ends and label size of sleeve on record drawings.

.9 Remove sleeve stake after submission of Record Drawings.

3.12 Valve Boxes

.1 Install manual and electric control valves, control zone kits and quick coupler valves in valve boxes or concrete vault as shown on Drawings.

.2 Except as shown otherwise on Contract Drawings or approved otherwise by Contract Administrator, locate valve boxes in planting beds and locate for ease of access, maintenance, and testing.

.3 Install valve box flush with finish grade and arrange in a neat and orderly manner.

.4 Provide minimum 2" clearance between valve box and all components within.

.5 Valve box must not contact irrigation pipe. Use 12" height matching valve box extensions as required.

.6 Up to three (3) 1" control valves or two (2) 1½" control valves may be contained within a single valve box provided there is 4" of clearance between valves. Install valves 2" and larger in their own valve box.

3.13 Electrical Control Valve

.1 Install in valve box per manufacturer's recommendations and Contract Drawings.

.2 Identify electric control valve with permanent label or tag indicating zone number of valve.

3.14 Quick Couplers

.1 Install in valve box per manufacturer's recommendations and Contract Drawings.

3.15 Gate Valve

.1 Install in valve box per manufacturer's recommendations and Contract Drawings.

.2 Where points of connections are located within a building, install isolation valve immediately downstream of where pipe exits building, installed in rectangular valve box.

3.16 Blow-Out Assembly

.1 Install blow-out assembly immediately in vault at point of connection. In the case where the point of connection is inside a building, install blow-out connection immediately downstream of isolation valve where mainline pipe exits building.

3.17 Drip Zone Kits

.1 Install in valve box per manufacturer's recommendations and Contract Drawings.

.2 Identify electric control valve with permanent label or tag indicating zone number of valve.

3.18 Filters

.1 Install filter in same valve box as valve, per manufacturer's recommendations and Contract Drawings.

3.19 Swing Joint Assembly

.1 Fabricate assembly of triple swing joint using three threaded Schedule 40 PVC elbows and one threaded Schedule 80 PVC nipple for sprinklers flowing more than 8gpm and pre-assembled Rain Bird swing joint assemblies for sprinklers flowing up to 8gpm.

.2 Install swing joint assembly to rotate counterclockwise when depressed.

.3 Tape threads of PVC fittings with Teflon tape and make hard hand tight.

3.20 Sprinklers

.1 Install per manufacturer's recommendations and in location shown on Contract Drawings.

.2 Location of heads as illustrated on Contract Drawings is intended as a guide to layout of heads. Establish actual head locations in the field to ensure complete and adequate coverage of all areas to be irrigated and no overspray onto adjacent surfaces and improvements. Do not exceed head spacing shown on Contract Drawings.

.3 Where obstructions or site improvements hinder or block head to head coverage advise Contract Administrator and determine best method to maximize coverage.

.4 For flat surfaces install head plumb to finished grade. For sloped surfaces install head perpendicular to half the grade of the slope.

.5 Mount pop-up heads on triple swing joint assembly. Connect bottom inlet of sprinkler to swing joint assembly, not side inlet. Adjust swing joint assembly to set head flush with finish grade. Tape threads of PVC fittings with Teflon tape and make hand tight.

.6 Adjust arc, radius of coverage and flow at each sprinkler to achieve even head to head coverage of area to be irrigated, with minimum over spray onto other surfaces.

3.21 Landscape Dripline

.1 Do not install driplines or emitters of different flow lengths or spacing on the same zone.

.2 Place dripline on prepared surface. Surface to be free of sharp rocks or other objects that may damage dripline. Surface to be at grade necessary for dripline to be at specified depth after placement of remainder of topsoil or growing medium.

.3 Placement of dripline by trenching using hand or mechanical methods permitted only if specified as such on Contract Drawings or upon written approval of Contract Administrator.

.4 Thoroughly flush each zone after installation and before beginning regular operation of drip zone.

.5 Stake dripline in beds every 18" on centre.

.6 Make all zone connections and test manifold, lines and fittings for leaks prior to placement of topsoil or growing medium over manifold, headers, dripline and emitters.

3.22 Drip Emitters

.1 Install per manufacturer's recommendations and as shown on Contract Drawings.

3.23 Lateral Flush Assembly

.1 Install flush assembly on swing joint in valve box.

.2 Coil hose in valve box.

3.24 Pipe and Fittings

.1 Verify that all pipe, fittings, primer and cements are compatible for proper installation.

.2 Do not locate open side of trench any closer than 12” from hard surface or feature.

.3 Keep inside of pipe and outside of pipe ends clean at all times. Cap or plug open pipe ends to keep out dirt and debris.

.4 Cut PVC pipe ends at right angle to pipe length. Clean burrs prior to joining pipe and fittings.

.5 Immediately prior to joining pipe and fittings wipe contact surfaces clean with primer on clean rag.

.6 Apply light coat pipe of cement on inside of fitting and heavier coat on outside of pipe. Insert pipe into fitting and give a quarter turn to seat cement. Wipe excess cement from outside of pipe.

.7 Wrap male threads of threaded fittings with minimum 3 wraps of Teflon tape immediately prior to making connection.

.8 Flush all irrigation pipe fully to remove accumulation of dirt and debris prior to installation of heads, dripline, emitters and filters. Flush all laterals in a manner approved by the manufacturer to prevent clogging of screens, nozzles and emitters.

.9 Conduct mainline pressure test and HDPE pipe strap test and obtain approval of Contract Administrator prior to backfilling lines.

.10 Sidewall fusion of HDPE is not acceptable.

.11 Set mainlines and laterals on and backfill with sand to clearance limit shown on Drawings.

.12 Install thrust blocks at all changes in direction of PVC pipe 2 ½” in diameter or greater, and for any change in direction of gasketed pipe.

.13 Install lateral piping at a depth of 12” to 24”.

.14 Install mainline piping at a depth of 18” to 32”.

3.25 Thrust Block

.1 Place thrust block to support the pipe joints from separating, not to prevent the pipe from heaving. Do not cover top of pipe with concrete thrust blocking at change from a horizontal alignment to a vertical alignment.

.2 For thrust blocks installed in disturbed soils increase the thrust block area by 50%.

.3 Place 2 ply of 6mil polyethylene between pipe and thrust block.

.4 Allow concrete to set before backfilling trench or pressurizing line.

.5 Obtain approval from Contract Administrator prior to backfilling thrust block.

3.26 Cleanup and Restoration

.1 Remove all waste and debris resulting from irrigation installation from site.

.2 Restore all disturbed surfaces to original condition and repair all trench settlement.

3.27 Instructions to Owner

.1 Instruct Owner in complete operating and maintenance procedures for irrigation system, including start-up, winterization, and programming.

.2 Review Record Drawings and Operating Manual with Owner on site.

3.28 General Maintenance

.1 Inspect, operate, maintain and adjust irrigation system through the Landscape Maintenance Period until issuance of Certificate of Acceptance to ensure it operates as intended, including but not limited to:

.1 Adjust irrigation schedule to ensure survival, health and growth of plant material and respond to soil conditions, climate, and seasons of site.

.2 Clean sprinkler heads and adjust coverage to eliminate over watering, under watering and overspray onto adjacent surfaces.

.3 Monitor and clean filtration equipment.

.4 Restore grass areas, planting beds, hard surfaces and improvements affected by trench settlement and erosion.

.5 Respond to requests from Contract Administrator for program adjustments, servicing, adjustments and repairs.

3.29 Winterization Maintenance

.1 During Maintenance Period be responsible for winterization of irrigation system at end of growing season and prior to onset of air temperatures below 0º Celsius. Be liable for any damage resulting from late or improper winterization.

.2 Request presence of Owner at winterization at least 5 days prior to proposed winterization date.

.3 Winterization includes but is not limited to:

.1 Deactivation of controller

.2 Drainage and blow-out assembly of entire irrigation system.

3.30 Maintenance Spring Start-up

.1 During Maintenance Period be responsible for spring start-up of irrigation system at beginning of growing season or within 10 days of request for start-up from Owner. Be liable for any damage resulting from late or improper start-up.

.2 Ensure Owner is present for spring start-up. Request presence of Owner at least 5 days prior to proposed start-up.

.3 Spring start-up includes but is not limited to:

.1 Checking and testing for leaks

.2 Cycling irrigation control program through all zones to ensure proper function and performance

.3 Checking and adjusting heads and emitters to achieve even coverage with minimum overspray onto other surfaces.

.4 Test backflow prevention assembly. Submit test results to Contract Administrator.

.5 Saturation of soil with water to a depth of 12" to provide deep watering of all lawn areas, planting beds and tree pits

3.31 Guarantee

.1 Submit written guarantee, in approved form, stating that all work showing defects in materials, workmanship or operation will be repaired or replaced at no cost to Owner for a period of one year from date of Substantial Performance.

.2 Guarantee includes the supply of labour, materials and equipment necessary for the repair and replacement of damaged or defective materials and workmanship. Guarantee also includes spring start-up, winterization, maintenance, necessary testing, program corrections or adjustments and restoration of settled trenches.

.3 Guarantee will not apply to materials or workmanship damaged after Substantial Performance by causes beyond the Contractor's control, such as vandalism or abuse.

END OF SECTION

1.0 GENERAL

1.0 General Requirements

Delete 1.0.1 and replace with the following

.1 Section 32 91 21 refers to those portions of the *Works* that are unique to the supply, placement and finish grading of *Growing Medium*. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the *Works* described herein.

For the purpose of this specification, the term *"Growing Medium"* shall mean a soil produced offsite by homogeneous blending of mineral particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth and the term *"Topsoil"* shall mean on-site native or surface soil material which may be used as *Growing Medium* provided it meets standards set for imported material *Growing Medium* and can be modified to meet the requirements set out for specified *Growing Medium*.

Add 1.0.3

.3 For the purpose of this specification, the term *'Soil-Testing Laboratory'* shall mean an independent laboratory, recognized by the landscape nursery industry, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

1.4 Measurement and Payment

Delete 1.4.1 and replace with the following

Payment includes supply and installation growing medium and imported top soil that is free from any noxious weeds, fungal growth, mushroom, and any contaminants. Payment will be made separately and includes supply of material, on-site handling, preparing the landscape area subgrade, placing as specified, grading, raking, compacting top soil and application of fertilizers. Payment for growing medium will be for actual volume placed onsite.

Add 1.4.4

Payment includes supply and installation of structural soil as per specifications described in this Section. Payment will be made separately and includes supply of material, geotextile, on-site handling, mixture, preparing the landscape area subgrade, placing as specified, grading, raking, and compaction. Payment for structural soil will be for actual volume placed onsite.

1.5 Inspection and Testing

Delete 1.5 and replace with the following

.1 The *Contractor* is responsible for testing imported *Growing Medium* and all related cost incurred. Testing shall be carried out by an approved *Soil Testing Laboratory*.

.2 The sample analysis shall be of tests done on the proposed *Growing Medium* from samples taken at the supply source within a minimum of 14 days in advance of *Growing Medium* placement. Allow 7 days for soil testing by the laboratory for each sample. The sample shall be picked up by the *Soil Testing Laboratory* from the supply source. The *Growing Medium* sample shall be a composite of at least three (3) samplings for the proposed source and shall be at least one (1) litre in volume.

.3 Forward a copy of all test results directly to the *Contract Administrator* and the City for review. The analysis shall outline the testing laboratory's required amendments such as sand, organic matter, fertilizers and lime to achieve adequate growing conditions.

.4 The *Contractor* shall not deliver any *Growing Medium* to the site until the test results have been reviewed and approved by the *Contract Administrator* and the City.

.5 All submitted soil analysis must be dated and include supplier name and phone number, project location and submitted to *Contract Administrator* and the City for approval prior to commencing work. Soil analysis shall include measurements of:

.1 Percent sand, fines, silt and clay
.2 Organic matter to 100%
.3 pH, acidifying additive required to achieve noted herein
.4 Water soluble salts
.5 Total carbon to nitrogen ration
.6 Total nitrogen and available levels of phosphorus, potassium, calcium & magnesium

.6 At the discretion of the *Contract Administrator* and the City submit up to two (2) additional samples, at intervals outlined by the *Contract Administrator* and the City, of *Growing Medium* taken from material delivered to the site. Samples shall be taken form a minimum of three (3) random locations and mixed to create a single uniform sample of testing. Results of these tests shall be forwarded to the *Contract Administrator* and the City for review.

.7 The *Contractor* is responsible for soil analysis and requirements for amendments to supply *Growing Medium* as specified. Failure to satisfy these contractual requirements could result in the *Contractor* being required to remove unacceptable *Growing Medium* at their expense.

.8 Notify the Contract Administrator at least forty-eight (48) hours prior to Growing Medium placement for inspection.

.9 Refer to General Conditions, Clause 4.12 Tests and Inspections.

1.6 Product Handling — Add 1.6

.1 All materials to be handled and adequately protected to prevent damage. Do not handle *Growing Medium* in an excessively wet, extremely dry, frozen condition or in any manner in which structure may be adversely affected. *Growing Medium* whose structure has been damaged by handling under these conditions shall be rejected and shall be replaced by the *Contractor* at their expense.

.2 Stockpile materials in bulk form in paved areas or in pre-approved areas of the site. Provide additional protection of storage under roof or tarpaulins.

.3 Take all precautions to prevent contamination of *Growing Medium* and amendments from wind blown soil particles, weed seeds and from insects. Contamination of the *Growing Medium* and amendments may result in their rejection for use.

.4 Store fertilizer and chemical amendments in the manufacturer's original containers.

.5 All *Growing Medium* shall be delivered to site <u>premixed</u> from a recognized *Growing Medium* source ensuring consistency throughout the mix.

2.0 PRODUCTS — Delete 2.0 and replace with the following

2.1 Materials

.1 *Growing Medium* Preparation

.1 Shall be prepared from Compost Material with Sand and other Soil Amendments as required to meet the specifications herein.

.2 Ensure commercial processing and mixing of *Growing Medium* components are done thoroughly by a mechanized screening process. Do not mix the components by hand. Ensure the resulting product is a homogeneous mixture having the required properties throughout free of stones 25 mm or larger in any dimension, woody plant parts, toxic materials, foreign object and other extraneous materials harmful to plant growth. Provide composted soil free from crabgrass, couch grass, equisetum, convolvulus, or other noxious weeds or seed or parts thereof.

.2 Inorganic Soil Amendments

.1 Sand: Imported pit sand or river pump sand, free of impurities, chemicals, horsetails, and other noxious weeds. The saturation extract electrical conductivity of salinity shall not be greater than 3.0 millimhos/cm at 25 degrees C.

Sieve Size (mm)	Percent passing (%)
4.75	95-100
0.50	0-40
0.050	0-5

.2 Fertilizers: Uniform in composition, free flowing and dry, granular, pill form, or pelleted commercial product with 50% of total nitrogen (if applicable) derived from natural organic material in a slowly available form delivered in unopened water proof containers with the manufacturer's guaranteed N-P-K analysis, type and trade name attached to each container. The planting soil test results will specify a formulation and application rate to achieve the levels of nitrogen, phosphorous and potassium required. Fertilizer to meet the requirements of the Canada Fertilizer Act.

.1 Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

.1 Class: Class T, with a minimum 99 percent passing through No. 8 (2.36 mm) sieve and a minimum 75 percent passing through No. 60 (0.25 mm) sieve.

.2 Provide lime in form of dolomitic limestone.

.3 Perlite: Horticultural perlite, soil amendment grade.

.3 Organic Soil Amendments

.1 Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 25 mm sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

.1 Organic Matter Content: 50 to 60 percent of dry weight containing no cedar, redwood, wood or bark.

.2 Colour: dark brown to black in colour.

.2 Peat:
- .1 Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

.3 Wood Residual
- .1 Content of wood residuals such as Fir or Hemlock sawdust present in the *Growing Medium* shall not cause the total carbon to total Nitrogen ration to exceed 40:1.
- .2 Cedar or redwood sawdust shall not be present in *Growing Medium*.

.4 Manure
- .1 Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth and free from salt or other harmful chemicals, such as any used to artificially hasten decomposition.
- .2 All particles in manure to pass a 6.35 mmm sieve.
- .3 Salt content shall give a reading of less than 0.5 millimhos/cm at 25 degrees C.

2.2 Nutrient Requirements

.1 Nutrient requirements shall meet the BCSLA/BCNTA Landscape Standard *Growing Medium* requirements for nitrogen, phosphorus, potassium, calcium, magnesium, boron, sodium cation exchange capacity, carbon to nitrogen ratio.
- .1 Boron: not to exceed 1.0ppm
- .2 Sodium: Sodium absorption ratio(SAR) not to exceed 8.0
- .3 Total Nitrogen: to be 0.2-0.4% by weight
- .4 Available Phosphorous: to be 50-100 ppm
- .5 Available Potassium: to be 50-70 ppm
- .6 Cation Exchange Capacity: to be 30 to 50 meq.
- .7 Carbon to nitrogen ratio: Maximum 40:1.

2.3 Salinity

.1 The electrical conductivity of the liquid taken from the soil pH evaluation shall not exceed 3.0 millimhos/cm at 25 degrees C before additions of fertilizers and/or liming agents.

2.4 Drainage Rate

.1 Percolation shall be such that mixing, handling and placement to be done in such a manner that the minimum saturated hydraulic conductivity show on Table – *'Growing Medium Properties for Different Applications'* (found herein these specifications) is achieved and no standing water is visible 60 minutes after at least 10 minutes of moderate to heavy rain or irrigation.

2.5 Growing Medium Source

.1 Import planting medium or manufactured planting medium from off-site sources. Do not obtain from agricultural land, bogs or marshes.

.2 Supplier of Growing Medium shall be as per the Coquitlam Approved Products List.

2.6 Bark Mulch

.1 Mulch backfilled surfaces of planting beds and other areas indicated on drawings.
- .1 Organic Mulch: Apply 50 mm average thickness of organic mulch, and finish level with adjacent *Finish Grade*s. Do not place mulch against plant stems.

.2 Supplier of Bark Mulch shall be as per the Coquitlam Approved Products List.

.3 Dark brown in colour and free of all soil, stones, roots or other extraneous matter, and free of weeds, seeds and spores.

2.7 Growing Medium Properties for Different Applications

Properties	Low Traffic Lawn Areas, Trees and Large Shrubs	High Traffic Lawn Areas	Planting Areas, Planters Shrubs & Groundcover
Texture: Particle size classes by Canadian System of Soil Classification	Percent of Dry Weight Mineral Fraction (%)		
Gravel (greater than 2 mm less than 75 mm)	0-10	0	0
Sand (greater than 0.05 mm and less than 2 mm)	50-70	80-90	50-70
Silt (larger than 0.002 mm and less than 0.5 mm)	10-30	5-20	10-30
Clay (less than 0.002 mm)	7-20	2-5	7-20
Organic Content Percent of Dry Weight	5-10	3-5	25-30
Drainage Minimum saturated hydraulic conductivity (cm/hr) in place	2.0	7.0	2.0
Acidity (pH)	6.0-6.5	6.0-6.5	5.0-6.0

2.8 Miscellaneous Products

.1 Root Barrier: 400x610 mm linear root barrier, copolymer polypropylene, 50% recycled plastic, black in colour. Supplier of Root Barrier shall be as per the Coquitlam Approved Products List.

.2 Construction Adhesive shall be as per the Coquitlam Approved Products List.

.3 Drain Mat: Light duty, uv stable, impermeable cuspated core bonded to a layer of non-woven filter fabric with the following minimum properties:

.1 Compressive Strength -718 kN/m2 as per ASTM D-1621
.2 Flow Rate – 188 l/min/Metre as per ASTM D-4716
.3 Approximate profile thickness of 10 mm.
.4 Supplier of Drain Mat shall be as per the Coquitlam Approved Products List.

.4 Filter Fabric: Install root barriers in accordance with manufacturer's reviewed installation instructions where indicated on reviewed drawings with vertical root directing ribs facing inwards towards trees or plants; connect panels together as required.

1. Supplier of Filter Fabric shall be as per the Coquitlam Approved Products List.

.5 Drain Rock: Shall consist of clean round stone or crushed rock. Acceptable material includes 19 mm drain rock or torpedo gravel conforming to the following gradations.

Percent Passing		
Sieve Designation	Coarse	Fine (Torpedo gravel)
25 mm	100	
19 mm	0-100	
9.5 mm	0-5	100
4.75 mm	0	50-100
2.36 mm		10-35
1.18 mm		5-15
0.60 mm		0-8
0.30 mm		0-5
0.15 mm		0-2

2.9 Structural Soil

.1 Soil stabilizer shall be friable, containing a minimum of 4% and maximum of 6% organic matter by dry weight, free from stones and debris over 30 mm. Acidity (ph) shall be in the range 5.5-7.5. Carbon to nitrogen ratio shall not exceed 40:1, and salinity shall not exceed 3.0 milliohms at 25 deg C. Gravel greater than 2 mm shall not exceed 10% of total weight.

.2 Supplier of Structural Soil shall be as per the Coquitlam Approved Products List.

.3 *Growing Medium* to be a gap-graded mixture.

.4

Texture of Growing Media	Percentage of mixture
Gravel: greater than 2 mm-less than 75 mm	0%
Sand: greater than 0.0 5mm-less than 2 mm	max 60%
Silt: greater than 0.002-less than 0.0 5mm	max 35%
Clay: less than 0.002mm	max 15%
Clay and silt combined	max 40%
Acidity (pH)	6.0-7.0
Drainage: minimum saturated hydraulic Conductivity (cm/hr) in place	3.0
Salinity: saturated extract conductivity shall not exceed at 25 degC	3.0 milliohms/cm
Organic content: percent of dry weight	8-12%

5 Stone ballast: Clean inert stone of high angularity is preferred over washed gravel. Stone dimension aspect ratio should be 1:1:1 with a maximum 2:1:1 length:width:depth. Single size stone, 60 mm-75 mm clear sieve designation: Blasted Quarry Rock. Aggregate to be used for structural soil shall be free of any foreign elements or material.

.6 Structural Geotextile
Shall be installed as a structural filter layer directly above the compacted structural soil mixture. Do not install fabric until adequate compaction of the structural soil mixture has been confirmed. Filter fabric shall be selected and deigned to withstand wear and tear during construction without deterioration of its strength and filtering properties.

.1 Supplier of Geotextile shall be as per the Coquitlam Approved Products List.

.7 Ground dolomite limestone containing no less than 85% of its total weight as calcium carbonate and magnesium carbonate shall be used to control ph level. The degree of grind for the limestone shall allow 100% of the total weight to pass a #10 (2 mm) sieve, 90% to pass a #18 (1 mm) sieve and 20% to pass a #40 (0.105 mm) sieve. Spread-easy fertilizer shall be used as a slow release fertilizer source of calcium and magnesium.

.8 Mixing of structural soil:
Blend as per following ratios:
.1 5 metric tonnes (MT) of aggregate
.2 1 cubic meter of growing media
.3 2 kg soil stabilizer

.9 Moisten mixture with fine spray of clean potable water while mixing to activate soil stabilizer product. Do not over mix. Place mixture in 300 mm lifts through entire area of structural soil mixture. Compact each lift to 95% MPD prior to placement of next lift. Install filter fabric such to ensure a minimum of 60 cm overlap of all fabric seams and beyond edge of structural soil.

3.0 EXECUTION

3.2	**Preparation of Subgrade**	Delete 3.2.4 and replace with the following	Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials, soil contaminated with calcium chloride, toxic materials and petroleum products, and debris which protrudes more than 25 mm above the surface. Dispose of all removed material off site to approved offsite disposal area at no additional cost to the *Owner*.
		Delete 3.2.5 and replace with the following	Course cultivate entire area which is to receive *Growing Medium* to depth of 250mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.
		Add 3.2.6	Grade transitions shall be smooth and even and shall blend into surrounding areas as determined by the *Contract Administrator* and the City.
		Add 3.2.7	Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
3.3	**Processing Growing Medium**	Add 3.3.4	*Growing Medium* shall be imported and stockpiled on site in a location approved by the *Contract Administrator* and the City. .1 Carry out stock piling operation such that the *Growing Medium* structure is not compromised through compaction, vibration or other actions. .2 Stock piled *Growing Medium* shall be protected from rain, drying and contaminants. .3 *Growing Medium* shall be free of subsoil, pests, roots, wood, construction debris, undesirable grasses including crabgrass or couch grass, noxious or weeds and weed seeds or parts thereof foreign objects and toxic materials. Presence of these contaminates shall be grounds for rejection of *Growing Medium* and replacement at no cost to the *Owner*.
3.4	**Placing Growing Medium**	Delete 3.4.2 and replace with the following	Place *Growing Medium* to the required finished grades with adequate moisture, in uniform lifts of 100 mm to 150 mm compacted to 80 MPD

during dry weather, over dry, unfrozen *Sub Grade* where planting is indicated free of any standing water.

Delete 3.4.5 and replace with the following

Minimum depths after settlement and 80% compaction:

.1	Trees pits:	900 mm
.2	Shrub beds:	450 mm
.3	Ground cover areas:	300 mm
.4	Lawn areas:	300 mm
.5	Blvd. areas:	150 mm

Add 3.4.6

Increase sand content to 90% in the planting soil below lawns where heavy wear by pedestrians or maintenance equipment is anticipated. Increase sand content in a 1.5m wide strip at the bottom of swales, banks or other wet areas and as directed by the Landscape Architect. On steep south or west facing banks, reduce sand content in lawns and planting beds to 50 - 60% for better moisture retention.

3.5 Applying Fertilizers

Delete 3.5 and replace with the following

.1 Addition of amendment components shall be at the rates indicated in the *Growing Medium* analysis recommendations via the following methods:
- .1 Lime: Applied with mechanical spreaders over entire planting areas and contained planters.
  - .1 Do not apply by hand.
  - .2 Mix thoroughly into the top 100 mm of *Growing Medium*.
  - .3 Do not allow lime to come into direct contact with nitrogen - phosphate - potash fertilizers.
- .2 Fertilizer: Applied with mechanical spreaders over entire planting areas and contained planters. Do not apply by hand. Do not mix into *Growing Medium*.

3.6 Finish Grading

Delete 3.6.1 and replace with the following

Manually fine grade *Growing Medium* installation to contours and elevations shown on drawings or as directed by *Contract Administrator* and the City. Eliminate rough spots and low areas to ensure positive drainage.

Add 3.6.3

Finish Grade of *Growing Medium* shall be 25 mm from finished elevation of adjacent curb or planter wall unless otherwise noted on drawings.

3.9 Clean-up

Delete 3.9 and add the following

.1 Ensure all paved areas, tops of planters, adjacent surfaces have been thoroughly cleaned. Ensure all discoloration of adjacent surfaces as a result of *Growing Medium* installation have been removed.

.2 Dispose of materials not required and repair any damage to adjacent surfaces (as determined by the *Contract Administrator* and the City) off site at no additional cost to the *Owner*.

3.10 Weed Control

Add 3.10

.1 Ensure all weeds and weed roots that have germinated during the course of work of this section have been eliminated from Growing Medium.

.2 Provide the Contract Administrator and Consultant with a written outline of weed removal methodology seven (7) days prior to starting weed removal operations.

3.11 Structural Soil

Add 3.11

.1 Refer to 2.9 in this specification and as shown on the Contract Drawings.

END OF SECTION

1.0 GENERAL

1.3	**Scheduling**	Delete 1.3 and replace with the following	.1 Schedule all operations to ensure optimum environmental protection, grading, g*rowing medium* placement, planting, seeding or sodding operations as outlined in the specifications. .2 Schedule seeding to coincide with preparation of soil surface. .3 Organize scheduling to ensure a minimum of on-site storage of seed and fertilizer material, minimum movement and compaction of *growing medium*, and prompt watering operations. Coordinate work schedule with scheduling of other trades on site. .4 Plan, schedule and execute the work to ensure a supply of water for landscape purposes in adequate amounts and at adequate pressures for satisfactory irrigation of all seeded areas.
1.4	**Handling and Storage**	Add 1.4.2	Protect existing Site features against damage or contamination due to Work of this Section. Make good all damage or contamination which occurs to the satisfaction of the *Contract Administrator* and the City.
		Add 1.4.3	Deliver seeds, mulch, fertilizers, tackifier and other products to the Site in manufacturer's original containers, clearly identified. Do not remove or deface labels or other identification.
1.5	**Drainage Control**	Delete 1.5 and replace with the following	Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil or growing medium or hydraulic seed is detained and cleaned prior to discharge from site.
1.6	**Samples**	Add to 1.6.1	The *Contract Administrator* and the City may test for purity and germination.
1.7	**Site Examination**	Delete 1.7.1 and replace with the following	Examine site prior to the commencement of work to verify surface preparation is complete and has been accepted by the *Contract Administrator* and the City.
1.8	**Measurement and Payment**	Delete 1.8.1 and replace with the following	Payment for hydraulic seeding includes the necessary equipment and supply and application of hydraulic mulch & grass seed as shown on the Contract Drawings or as directed by the Contract Administrator. Measurement for payment will be made for surface actually seeded. Areas of overseeding onto existing grass or sod will not be measured for payment.
1.10	**Quality Assurance**	Add 1.10	.1 *Contractor* to provide seed analysis that will include but is not limited to: .1 Name and address of supplier .2 Analysis of seed mixture .3 Percentage of pure seed .4 Year of production .5 Date and location of bagging .6 Percentage germination .2 The sample accepted by the review will form the standard by which the project will be supplied.

.3 Should the *Contractor* require the source of seed supply to change during the construction a written request must be provided to the *Contract Administrator* and the City 48 hours in advance. The request shall be followed up by submission of proposed seed supplier and substitution seed analysis for *Contract Administrator* and the City review prior to the start of supply to the site.

.4 All seed shall be delivered and stored in original containers in enclosed storage facility protected from the damage, weather, insects and rodents.

2.0 PRODUCTS

2.1 Grass Seed

Delete 2.1 and replace with the following

.1 Grass Seed shall be mixed and supplied by a recognized seed house and delivered in original containers, in accordance with Federal and Provincial seed laws having a minimum germination of 75% and minimum purity of 97%, and meet the requirements of the Government of Canada Seed Act for Canada No. 1 seed.

.2 Seed mixtures to be approved by the *Contract Administrator* in the original packaging. The seed mixture for boulevards and landscaped areas shall be made up from a minimum of three (3) varieties of Perennial Rye, one (1) of Kentucky Bluegrass and three (3) varieties of Fescue from Coquitlam Approved Products List.

.1 Seed Mix shall be 50% Perennial Rye, 35% Fescues, 15% Kentucky Bluegrass.

.2 Seed Rate shall be 50g per square metre.

.3 Table Guideline of Approved Seed Mix Ratios.

% Seed Count	% Weight	Seed Varieties
15%	25%	All-Star Perennial Rye Grass
5%	15%	Elka II Perennial Rye Grass
20%	15%	Cindy Creeping Red Fescue
15%	15%	Shamrock Kentuck Bluegrass
20%	10%	Cindy Lou Creeping Red Fescue
15%	10%	Longfellow II Chewing Fescue
10%	10%	Gator 3 Perennial Rye Grass
Acceptable products shall be an all-purpose sun / shade mix' conforming to the above mix ratios		

2.2 Hydraulic Mulch

Delete 2.2 and replace with the following

.1 Provide hydraulic seeding solution containing a mulch of wood cellulose fibre specifically designed for hydraulic seeding containing no growth or germination inhibiting factors, and dyed green for visual metering during application.

.2 Hydraulic mulch to be capable of dispersing rapidly in water to form homogeneous slurry and remaining in such a state when agitated or mixed with other specified materials. When applied, hydraulic mulch is to be capable of forming absorptive mat, which will allow moisture to percolate into the underlying soil and to contain no growth or germination inhibiting factors.

.3 Mulch is to be dry and free of weeds, weed seeds and other foreign material, and to be supplied in packages bearing manufacturer's label clearly indicating the weight and product name.

.4 Mulch shall contain a colloidal polythacuride (or equivalent) tackifier which is to be adhered to mulch to prevent separation during shipment and to avoid chemical agglomeration during

mixing in hydraulic mulching equipment. It shall be 'M-Binder' or approved alternative.

2.3	**Water**	Delete 2.3.1 and replace with the following	Water shall be potable, free of impurities that would inhibit sod growth. *Contractor* to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until *Total Performance* of work of this section.
2.5	**Dolomite Lime**	Add 2.5	.1 Dolomite lime shall be finely ground, containing not less than 90% calcium carbonate.
2.6	**Wood Posts**	Add 2.6	.1 Wood posts shall be 38 mm x 38 mm x 1.5 m No. 1 Grade or better Hem/Fir, untreated wood.
2.7	**Binder Twine**	Add 2.7	.1 Binder Twine shall be hemp based multiple strand string.
2.8	**Flagging Tape**	Add 2.8	.1 Flagging tape shall be 30 mm wide, biodegradable ribbon tape made of non-woven cellulosic material, colour: red, or an approved equal.
3.0	**EXECUTION**		
3.1	**Finish Grade Preparation**	Delete 3.1.2 and replace with the following	Prior to the broadcast of seed *Contract Administrator* and the City to review and direct minor adjustments and refinements of finish grades prior to the *Contractor* proceeding. Review includes grades, *Growing Medium* depth and condition of finished surface. Subsequent to the *Contract Administrator* and the City review the *Contractor* shall re-grade, add *Growing Medium* and make adjustments as directed by *Contract Administrator* and the City.
		Delete 3.1.5 and replace with the following	Finish grade smooth to extent required for class of seeding to be carried out, firm against footprints, lose textured and free of all stones, roots, branches, etc. larger than 25 mm or required for removal for class of seeding to be carried out.
3.2	**Seeding-General**	Delete 3.2.1 and replace with the following	Carry out hydraulic seeding during periods which are most favourable for the establishment of a health stand of grass within the following calendar seasons: .1 Spring (April 1st to June 15th) .2 Fall (August 15th to September 30th). .3 Hydraulic seeding shall not take place during periods of rain, freezing and/or abnormally hot and dry weather.
3.4	**Protection**	Add 3.4.4	Protect all seeded areas against trespassing and from damage at all times clearly marked, staked, string and flagging tape.
		Add 3.4.5	Perimeter Protection: All seeded areas shall be surrounded by a 900 mm high barrier made up of the following components: .1 Wood posts placed at 1.8 metres on centre. .2 Wood Posts to be driven to a depth of 300 mm .3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post. .4 Tie 300 mm strands of 'red' flagging tape at 450 mm intervals along the entire length of both strands of twine. .5 Maintain perimeter protection until *Total Performance* issued for seeded area. Upon acceptance remove perimeter fence and dispose of off-site.
		Add 3.4.6	Hydraulic seeded areas that have been damaged by construction operation, construction/ site personnel or construction traffic shall be replaced at no cost to the *Owner*s. Replacement shall include removal

of *Growing Medium*, regarding of subgrade, replacing *Growing Medium* and reseeding as required.

3.5 Application for Hydraulic Seeding

Delete 3.5 and replace with the following

.1 Thoroughly mix seed, fertilizer and hydraulic mulch in water slurry and distribute uniformly over surface with an approved hydraulic mulcher.

.2 All seeding is to be done during calm weather and on soil that is free of frost, snow, and standing water. Do not perform the work when wind exceeds 10 km/hr or when the soil is excessively dry.

.3 Measure quantities of each material to be charged into hydraulic seeder/mulcher tank accurately either in mass or by commonly accepted system of mass-calibrated volume measurements. Add materials to tank while it is being filled with water and in following sequence:

.1 Seed
.2 Fertilizer
.3 Mulch
.4 Tackifier

.4 Thoroughly mix materials into homogeneous water based slurry and distribute uniformly over the area and, all disturbed areas, to be hydraulically seeded.

.5 Seeding Rate:

.1 Apply at 435 kg/ha or, as recommended by supplier and approved by the *Contract Administrator* and the City.
.2 Fertilizer at the following rate: Evergrow 28-3-8 @ 29g/m2
.3 Fibre Mulch at the following rate: 15kg/m2
.4 Tackifier at the following rate: 45 kg/ha.

.6 Carry out hydraulic seeding with care to ensure homogeneous slurry does not come in contact with foliage of trees, shrubs or other susceptible vegetation.

.7 Do not spray homogeneous slurry on objects not expected to grow grass.

.8 Promptly rectify any overspray or damage that occurs during hydraulic seeding.

.9 Do not leave seed, fertilize, mulch and water slurry in tank for more than 4 hours. Slurry left in tank over maximum allowed time shall not be used for seeding and shall be disposed offsite.

.10 Follow up seeding with all maintenance procedures required to maintain the approved grades and obtain uniform germination. The *Contractor* is to carry out at no cost to the Owner, reseed operations at two (2) week intervals where germination has failed or wash outs have occurred.

3.7 Clean-up

Add 3.7.2

Flush all walks and paved areas clean to the satisfaction of the *Contract Administrator* and the City.

3.8 Grass Maintenance

Delete 3.8 and replace with the following

.1 Maintenance of hydraulic seeded areas shall begin immediately after hydraulic seeding operation and shall continue until all deficiencies noted in the *Substantial Performance* review have been rectified to the satisfaction of the *Contract Administrator* and the City and conditions for *Total Performance* been achieved. The *Contractor* is to notify the *Contract Administrator* and the City in writing forty eight hours (48) prior to stopping maintenance operations.

.2 Grass Cutting: After the 'first' cut of hydraulic seeded areas grass cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City:

.1 First cut of seeded areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 65mm.

.2 Continue regular weekly cutting at a height of 50 mm until *Total Performance*.

.3 Cutting operations shall be such that each cut is at right angles to the previous cut.

.4 *Contractor* to remove grass clippings after each cut and dispose of off-site.

.5 Roll when required to remove any minor depressions or irregularities.

.6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix.

.3 Fertilizer analysis shall conform to recommendations provided with *Growing Medium* analysis. Application of fertilizer shall follow manufacturers' recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring.

.4 Hydraulic seeded lawn areas to be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

3.9 Conditions for Total Performance

Delete 3.9 and replace with the following

.1 Conditions for *Total Performance* of Hydraulic Seeded areas:

.1 Hydraulic seeded areas are vigorously growing, well established with a thick, dense and healthy green appearance.

.2 Hydraulic seeded areas shall not have any eroded or wash out areas, bare or dead spots and are free of invasive and/or noxious broadleaf weeds and grasses.

.3 No surface *Growing Medium* is visible when established hydraulic seeded areas have been cut to height of 38 mm

.4 Hydraulic seeded areas have been cut at least two (2) times, to a height of 38 mm a minimum of (7) days apart.

.5 Grass is free of grass varieties other than those specified.

.6 Grass is sufficiently established that its roots are growing into underlying *Growing Medium*.

.7 Specified maintenance procedures have been carried out.

.2 Areas hydraulic seeded after September 30th will not be reviewed for *Total Performance* until April 30th the next year.

END OF SECTION

1.0	**GENERAL**	Delete 1.0.2 and replace with the following	This section is based on the "British Columbia Landscape Standards and the B.C. Nursery Trades Association. This standard is intended to set a level of quality, which is equalled or bettered in the construction documents.
1.4	**Handling and Storage**	Delete 1.4.3 and replace with the following	Schedule sod deliveries such that sod installation occurs within twenty-four (24) hours of being lifted from the source sod farm.
		Delete 1.4.4 and replace with the following	Sod shall be neatly stacked or rolled at the source sod farm, delivered and unloaded on sturdy pallets which are no more than 3 pallets high.
1.5	**Drainage Control**	Delete 1.5.1 and replace with the following	Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil, growing medium or hydraulic seed is detained and cleaned prior to discharge from *Place of Work*.
1.6	**Samples**	Add 1.6.2	Submit one (1) square meter of sod to the *Contract Administrator* and the City for review. Ensure sample is complete with name of sod farm, base soil type, seed mix percentage.
		Add 1.6.3	*Contract Administrator* and the City shall review sod sample for approval prior to installation. The sample accepted by the review will form the standard by which the project will be supplied.
		Add 1.6.4	Should the *Contractor* require the source of sod supply to change during the construction a written request must be provided to the *Contract Administrator* and the City 48 hours in advance. The request shall be followed up by submission of proposed sod substitution sample and include the name of sod farm, base soil type, seed mix percentage for *Contract Administrator* and the City review prior to the delivery.
1.8	**Measurement and Payment**	Delete 1.8.1 and replace with the following	Payment for nursery sod includes supply and placing of sod as shown on the Contract Drawings or as directed by the Contract Administrator and grass maintenance to meet Conditions of Total Performance. Payment includes protection from damage caused by any living creature.
2.0	**PRODUCTS**		
2.1	**Sod**	Delete 2.1.1 and replace with the following	Sod to be approved by the *Contract Administrator* and the City and to be nursery grown, true to type, conforming to standards of nursery Sod Growers' Association and their Nursery Sod Specifications. Sod to be quality, cultured turf grass grown from seed approved by Canada Department of Agriculture, free of disease, clovers, stones, pests and debris.
		Add 2.1.1.1	Nursery sod: .1 Shall be No. 1 Premium grade and contain only species of grass indicated on the supplier's certificate. .2 Sod shall be 'non-netted'
		Add 2.1.1.2	Table Guideline of Approved Sod Mix Ratios

Supreme Soil Base Sod	
(Elka II) Perennial Ryegrass	40%
(Shamrock) Kentucky Bluegrass	30%
(Cindy) Chewing Red Fescue	30%

			Seed Rate: 50g per square metre	
		Add 2.1.8	All sod shall be completely free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.	
2.2	**Water**	Delete 2.2.1 and replace with the following	Potable, free of impurities that would inhibit seed germination. *Contractor* to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until *Total Performance* of work of this section.	
2.3	**Fertilizer**	Add 2.3.2	Fertilizer shall be complete synthetic slow release fertilizer. Type and application shall be as required by the growing medium analysis report.	
2.4	**Wooden Pegs**	Add 2.4	.1	Wooden Pegs shall be 19 mm x 19 mm x 150 mm long No. 1 grade or better Hem/fir.
2.5	**Binder Twine**	Add 2.5	.1	Binder Twine shall be hemp based multiple strand string.
2.6	**Flagging Tape**	Add 2.6	.1	Flagging Tape shall be 30 mm wide, biodegradable ribbon tape made of non-woven cellulosic material, and red color, or an approved equivalent.
3.0	**EXECUTION**			
3.1	**Finish Grade Preparation**	Delete 3.1.2 and replace with the following	Prior to the placement of sod *Contract Administrator* and the City to review and direct minor adjustments and refinements of finish grades prior to the *Contractor* proceeding. Review includes grades, growing medium depth and condition of finished surface. Subsequent to the *Contract Administrator* and the City review the *Contractor* shall re-grade, add growing medium and make adjustments as directed by *Contract Administrator* and the City.	
		Delete 3.1.5 and replace with the following	Fine grade growing medium to lines and levels shown on Contract Drawings. Ensure that all low spots, humps and irregularities are eliminated prior to review by *Contract Administrator* and the City.	
3.2	**Sodding**	Delete 3.2 and replace with the following	.1	Sod shall not be placed during hot dry summer periods, at freezing temperatures, or over frozen growing medium.
			.2	Allow sod to dry sufficiently during wet weather to prevent tearing during lifting and handling.
			.3	Handle sod carefully to minimize tearing and dropping of soil.
			.4	Placement of Sod: .1 Lay sod in rows smooth and flush to adjoining grass areas and paving and top surfaces of curbs unless shown otherwise on *Contract Drawing*. Ensure there is a full roll width between the new sod and any adjoining surfaces. Small cut pieces from a full roll will not be accepted. .2 Stagger joints and ensure that sod sections are butted closely together without overlapping or leaving gaps between sections. .3 Cut out irregular or thin sections with a sharp knife. .4 Cut sod to fit tight around landscape elements. .5 Cut sod to create clean, smooth lines along all plant beds.

.5 Placement of Sod on Slopes:
- .1 Lay sod with the length of each sod section parallel to slope taking extra care to ensure that sod sections are butt tight and each sod section is set in a staggered formation.
- .2 On slopes exceeding 3:1 gradient ensure sod is secured with wooden pegs at intervals of not more than 450 mm along the center of each section. Ensure wooden pegs are driven flush with the sod.
- .3 Prior to acceptance of sod areas that have been secured with wooden pegs either remove the wooden pegs or drive each wooden peg at least 50 mm below finished grade.
- .4 Where required, place erosion control mesh or netting and secure with stakes or staples sunk firmly into ground to a minimum depth of 150 mm at maximum intervals of 4 meters along pitch of slope. Place stakes or staples horizontally across slope at intervals equal to width of mesh or netting minus 150 mm and drive flush with top of sod.

.6 Use a light roller to ensure that there is full, close contact between sod and growing medium. Use of a heavy roller to correct irregularities in grade is not permitted.

.7 Ensure all sodded areas are watered immediately after installation. Verify that water applied to has penetrated through sod into top 100 mm of growing medium. Continue watering operations as needed to ensure that adequate moisture content is maintain to encourage deep root growth and healthy, vigorous leaf growth.

.8 Protect newly placed sod from heavy foot traffic during installation and until acceptance by the *Contract Administrator* and the City. Protection shall include but is not limited to placement of wood planks or plywood of sufficient thickness to bear the imposed weight and prevent damage to sod or displacement and/or compaction of sod/growing medium.

.9 Sod that has been damaged by construction operation, construction / site personnel or construction traffic shall be replaced at no cost to the *Owner*. Replacement shall include removal of growing medium, regarding of sub grade, replacing growing medium and sod as required.

.10 Water sod area immediately with sufficient amounts to saturate sod and upper 100 mm of growing medium. Do not allow the sod to dry out so that the joints become visible.

3.4 Grass Maintenance — Delete 3.4 and replace with the following

.1 Maintenance of sodded areas shall begin immediately after sodded operation and shall continue until all deficiencies noted in the *Substantial Performance* review have been rectified to the satisfaction of the *Contract Administrator* and the City and conditions for *Total Performance* have been achieved. The *Contractor* is to notify the *Contract Administrator* and the City in writing forty eight hours (48) prior to stopping maintenance operations.

.2 Sod Cutting: After the 'first' cut of sodded lawn areas cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City:
- .1 First cut of sodded lawn areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 65 mm.

.2 Continue regular weekly cutting at a height of 65 mm until *Total Performance*.

.3 Cutting operations shall be such that each cut is at right angles to the previous cut.

.4 *Contractor* to remove grass clippings after each cut and dispose of offsite.

.5 Roll when required to remove any minor depressions or irregularities.

.6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix.

.3 Fertilizer analysis shall conform to recommendations provided with growing medium analysis. Application of fertilizer shall follow manufacturers' recommendations noting that after October 1 lawn areas shall not be fertilized until April 15th of the following spring.

.4 Sodded lawn areas shall be kept free of invasive and/or noxious broadleaf weeds, grasses including but not limited to poa annua, disease, fungi, detrimental nematodes and detrimental insects.

.5 All maintenance equipment and practices are to conform to the BC Landscape Standard Level 2 'Groomed'.

.6 Protect all sodded areas against trespassing and from damage at all times clearly marked, staked, string and flagging tape.

.1 Perimeter Protection: Where directed by the *Contract Administrator* and the City, sodded areas shall be surrounded by a 900 mm high barrier made up of the following components:

.1 Wood posts placed at 1.8 meters on centre.

.2 Wood Posts to be driven to a depth of 300mm.

.3 String two (2) strands of hemp based binder twine (or equal product) between posts. Insure one full wrap of twine around each post.

.4 Tie 300 mm strands of 'red' flagging tape at 450 mm intervals along the entire length of both strands of twine.

.5 Maintain perimeter protection until *Total Performance* issued. Upon acceptance by *Contract Administrator* and the City, remove perimeter fence and dispose of off-site.

3.5 Condition for Total Performance

Delete 3.5.1 and replace with the following

Conditions for *Total Performance* of Sodded areas:

.1 Sodded areas exhibit fully established root systems.

.2 No seams are visible between sod sections.

.3 Sod areas are smooth and evenly graded. No depressions, foot marks or vehicle tracks.

.4 Sod is free of bare and dead spots and does not have any broadleaf weeds, noxious grasses including but not limited to poa annua.

.5 No surface growing medium is visible when grass has been cut to height of 65 mm.

.6 Sodded areas have been cut a minimum of two (2) times, at seven (7) day intervals.

.7 Sodded areas are a uniform green colour with no discoloured sections or patches.

			.8 Sodded areas exhibit a thick, dense, uniform and healthy appearance.
		Add 3.5.2	Lawns sodded after September 30th will be not be reviewed for *Total Performance* until April 30th the next year.
3.6	**Guarantee / Maintenance**	Delete 3.6.1 and replace with the following	The *Contractor* hereby guarantees that the sod will remain free of weeds and defects for a period of one (1) year from the date of *Substantial Performance*. The *Contractor* shall make all corrections, adjustments and replacements required as a result of failure of all products in this section. During the *Maintenance Period*, the *Contractor* will replace sodded areas, determined by *Contract Administrator* and the City, to be dead or failing at the end of the *Maintenance Period*. Replacements to be made at next appropriate season and, conditions of guarantee will apply to all replacement seeding for one full growing season.
		Delete 3.6.2 and replace with the following	The Owner reserves the right to extend the *Contractor*'s *Maintenance Period* and responsibilities for one (1) additional year if, at end of the initial guarantee period, the development and growth of the sod is not sufficient to ensure future survival.

END OF SECTION

1.0	**GENERAL**	Delete 1.0.1 and replace with the following	Section 32 93 01 refers to those portions of the Work that are unique to the sourcing, supplying, placing and maintaining the plant material indicated on the *Contract Drawing* and the Plant List(s). This section must be referenced to and interpreted simultaneously with all other sections pertinent to the Work described herein.
1.2	**References**	Delete 1.2.2 and replace with the following	Canadian Nursery & Landscape Association (CNLA) Standard for Nursery Stock (current edition).
		Add 1.2.4	The British Columbia Landscape & Nursery Association (BCLNA).
		Add 1.2.5	ANSI A-300 Tree Pruning Guidelines
1.3	**Source Quality Control**	Delete 1.3 and replace with the following	.1 Seven (7) days prior to the *Contract Administrator* and the City review of plant material at source the *Contractor* shall confirm in writing availability of plant material noted on plant list. .2 Plant material will be supplied from nurseries who are certified by the Clean Plants program, Canadian Nursery Certification Institute (CNCI), current certification standard http://cleanplants.ca/. The certification shall include but is not limited to the requirements of the current active module(s), e.g. P. Ramorum module. The certification must extend to all fields and allied nursery operations where plant material is sourced. Only nurseries, fields and allied nursery operations that are certified will be permitted to supply plant material for this project. .1 Prior to the review of plant material by the *Contract Administrator* and the City the *Contractor* shall submit written documentation with CNCI certification stamp stating that the nursery has undergone all components of a certification program and has been audited to verify that all components are properly implemented. .2 The documentation submitted shall include but is not limited to the nurseries CNCI Clean Plants certification number. .3 Plant Material Review at the source nursery. .1 *Contractor* shall request for review of the plant material at source nursery to be a minimum of seven (7) days prior to scheduled review. .2 Shipping of plant material to the *Place of Work* shall not proceed until *Contract Administrator* has reviewed the plant material at the source nursery. .3 *Contract Administrator* and the City shall make one (1) visit to source nursery for review of plant material for entire project. .4 All plant material, including substitutions shall be gathered at one location for review. .5 *Contractor* shall accompany *Contract Administrator* during plant material review at the source nursery. .4 Plant Material Review at the *Place of Work* .1 All plant material shall be reviewed at the *Place of Work* by the *Contract Administrator* and the City prior to planting. .2 Plant material that is rejected by the *Contract Administrator* shall be immediately removed from the *Place of Work* and replaced at the *Contractor`s* expense. .5 Imported Plant Material

.1 Plant material imported from out of province and out of country shall be accompanied with necessary federal and provincial permits and import licenses.

.2 The *Contractor* shall conform to all federal and provincial laws and regulations with regard to horticultural inspection of domestic and imported plant material.

.6 Condition of Plant Material

.1 Plant rootballs and containers shall be completely free of noxious weeds and volunteer plants including Horsetail and Morning Glory.

.2 Plant materials grown or supplied in Fabric Containers are not acceptable.

.7 All materials and execution to conform to the latest edition of the BCNTA Guide Specifications for Nursery Stock and the BCNTA Guide Specifications for Landscape Construction.

1.4 Submittals and Scheduling

Delete 1.4 and replace with the following

.1 Submit inspection certificates as required by law for each shipment of plant material.

.2 *Contractor* shall provide in writing to the *Contract Administrator* and the City a minimum of seven (7) days prior to review of plant material at the source nursery a plant list confirming the quantity, botanical name, common name and size of plants specified.

.3 Substitutions

.1 *Contractor* shall provide in writing to the *Contract Administrator* and the City a minimum of seven (7) days prior to review of plant material at the source nursery a list of proposed substitutions for review.

.2 Plant substitutions shall be of similar genus and species and of equal or greater size as those originally specified. The list shall contain the following information:

.1 Botanical name, common name of the specified plant

.2 Botanical name, common name of the proposed substitute plant

.3 Pot size and plant size in the nursery

.4 Planting Schedule

.1 *Contractor* shall provide in writing to the *Contract Administrator* and the City upon award of the *Contract* a detailed Planting Schedule outlining dates and duration of planting operations.

.2 Revisions to the Planting Schedule as a result of delays of any kind shall be submitted to the *Contract Administrator* and the City in a timely manner prior to the start of planting operations.

.3 Schedule all planting to ensure optimum environmental protection, grading, growing medium placement, planting, seeding, or sodding operations as outlined in these Specifications. Organize scheduling to ensure a minimum duration of on-site storage of plant material, minimum movement and compaction of growing medium, and prompt mulching and watering operations. Coordinate Work schedule with schedule of other trades on-site.

.4 Coordinate and schedule plating such that no damage occurs to plant material before and after placement. In particular, meet requirements of living plant material.

.5 Product Data

.1 *Contractor* to submit a one (1) litre sample of Composted Mulch to the *Contract Administrator* and the City for review prior to delivery.
.2 *Contractor* to submit a one (1) litre sample of the Prepared Growing Medium to the *Contract Administrator* and the City for review prior to delivery.
.3 *Contractor* to submit three (3) copies of the anti-desiccant manufacturer product data and specification for *Contract Administrator* and the City review.
.4 *Contractor* to submit three (3) copies of the fertilizer manufacturer product data and specification for *Contract Administrator* and the City review.
.5 *Contractor* to submit three (3) copies of the Guying assembly including clamps, collar, guying wire, anchors and wire tighteners manufacturer product data and specifications for *Contract Administrator* and the City review.

1.5 Handling and Storage

Delete 1.5 and replace with the following

.1 Coordinate shipping of plant material and excavation of planting pits to ensure minimum time lapse between nursery digging and on site planting.

.2 Ensure branches of trees and shrubs are bound securely into a confined mass during handling and transport.

.3 Do not bind planting stock with rope or wire that would damage bark, break or damage branches or damage the natural shape of the plant.

.4 Protect plant material against abrasion, and exposure to extreme temperature change during transit.

.5 Cover plant foliage and branches with tarpaulin to prevent loss of moisture during transit.

.6 Fully support root ball of large trees during all lifting operations.

.7 Do not lift trees or shrub by the trunk or branches. Plant material to be moved by lifting the root ball or container.

.8 Remove broken and damaged roots with clean cuts using sharp pruning shears.

.9 Temporary Storage/ Heel-In of Plant Material onsite
.1 Temporarily store trees, shrubs and miscellaneous plant material that cannot be planted immediately by heeling-in. Acceptable heel-in material include approved growing medium or sawdust.
.2 Ensure temporary storage/heel-in area is shaded and protected from the wind.
.3 Provide sufficient water at regular intervals to ensure health of plant material in the temporary storage/heel-in area.
.4 Plant material that has not been properly maintained in the storage/heel-in area and illustrates signs of degradation or stress will be rejected by the *Contract Administrator* and the City. Rejected plant material shall be replaced by the *Contractor*.

1.9	**Measurement and Payment**	Delete 1.9.1 and replace with the following		Payment for trees will be for each tree of size & species specified. Payment for shrubs, grass, perennials, plugs and ground cover will be for each size & species specified. The unit price includes all preparatory work, supply and planting of the trees, shrubs, plants & etc. as applicable, and other incidental specified under this Section including maintenance to meet Conditions of Total performance.
		Add 1.9.3		Payment will be for supply and installation including labor, incidentals, equipment and material needed to complete the work and as shown on Contract Drawing.
1.11	**Substitutions**	Add 1.11	.1	If it is impossible to obtain the particular plant material listed on the Landscape Drawing, the *Contractor* may be permitted to suggest substitutions with types and variations possessing the same characteristics. The *Contractor* must request any substitutions of trees in writing at least one (1) month and shrubs and groundcover at least one (1) month prior to planting. Substitutions must be approved by the *Contract Administrator* and the City.
1.12	**Plant Material Supply and Search Area**	Add 1.12	.1	Before substitutions of plant material are proposed, documented proof that materials are not available through search on the west coast of Canada and United States must be provided. Area of supply shall include, but not be limited to, all of Western North America.
1.13	**Plant Material Identification**	Add 1.13	.1	Plant material that has been located by the *Contract Administrator* and the City and tagged for the project is to have the identification tags removed only after inspection and instruction by the *Contract Administrator* and the City after delivery to the *Place of Work*.
1.14	**Plant Material Replacement**	Add 1.14	1.	The *Contractor* shall remove from the *Place of Work* and immediately replace any plant material that has been determined by the *Contract Administrator* and the City to have died or failed to grow in a satisfactory manner during the guarantee or maintenance period.
			.2	The *Contractor* shall extend the guarantee on this replacement plant material for one (1) year from the date of replacement.
			.3	The *Contractor* shall continue such replacement and guarantee of plant material until the *Contract Administrator* and the City has determined that the *Conditions for Total Performance* have been met.
			.4	All required replacements shall be plants of the same size and species as specified on the plant list and shall be supplied and planted in accordance with the drawings, specifications and change orders thereto.
			.5	The cost of replacements resulting from theft, accidental damage, vandalism, carelessness, neglect on the part of others, shall be borne by the *Contractor* until the date of *Substantial Performance*.
2.0	**PRODUCTS**			
2.1	**Plant Material**	Delete 2.1 and replace with the following	.1	Plant Material Size .1 Overall plant spread to be measured when branches are in their natural position. .2 Height and spread dimensions refer to main body of plant and not from branch tip to branch tip.

.2 Grade of plant material to be No. 1 grade or better.

.3 Plant material obtained from areas with milder climatic conditions from those of the *Place of Work* is acceptable provided:
- .1 Plant material is moved to the *Place of Work* prior to the breaking of buds at their original climatic zone.
- .2 Plant material is heeled-in at a protected area until the climatic conditions are suitable for planting.

.4 Plant material shall have structurally sound, strong fibrous root system free of disease, insects, defects or injuries. All plants, typical of their species or variety, have a normal habit of growth and shall be first quality, sound, healthy, vigorous, well branched, and densely foliated, free of disease, insect pests, eggs or larvae.

.5 Root Pruning at Source Nursery
- .1 Plant material shall have been root pruned on a regular basis at the source nursery.
- .2 Plant material shall be root pruned at least one growing season prior to delivery.
- .3 Large trees shall be half root pruned during each of two successive growing seasons. The second root pruning shall have carried out a minimum of one growing season prior to delivery.

.6 Shade, Ornamental and Evergreen Trees:
- .1 Trees shall have straight trunks and a well-formed branch system which is characteristic of the species
- .2 Trees shall exhibit clear signs of vigorous growth.
- .3 Trees shall have good twig extension growth, branch spacing and trunk taper.
- .4 Tree foliage shall be evenly distributed on upper 2/3 of the tree.
- .5 Trees shall not have upright branches other than leaders.
- .6 Trees shall have spreading branches with a single trunk and a single leader and, unless otherwise noted on plans or plant list.
- .7 Tree trunks and branches shall not have any mechanical damage.
- .8 Trees shall be in good health with no presence of insects or disease.
- .9 Trees shall not have been 'headed back'.
- .10 Tree root balls shall be solid, kept moist at all times and/or protected from drying.
- .11 Trees shall not exhibit symptoms of root circling or girdling.

.7 Container Grown Plant Material:
- .1 Root ball to container relationship shall be of sufficient ratio to ensure room for healthy, vigorous root development.
- .2 Plant material shall have been container grown for a minimum of one (1) growing season but not longer than two (2) growing seasons.
- .3 The plant root systems that do not have the ability to "hold" growing medium when removed from the container will be rejected.
- .4 Root bound plant material will be rejected.

.8 Balled and Burlapped Plant Material:

.1 Coniferous and broadleafed evergreens over 2.4 metre tall shall be dug with firm soil root ball.
.2 Deciduous trees in excess of 3.0 metre height shall be dug with firm soil root ball.
.3 Root ball diameter shall be a minimum of 230 mm (for each 25 mm caliper size.
.4 Secure root-balls with burlap, heavy twine and rope.
.5 Large tree root balls shall be double layer burlap wrapped. Burlap to be secured with drum laces made up of 10 mm (minimum) diameter rope.

.9 Tree Spade Dug Plant Material
.1 Plant material shall be dug with mechanized hydraulic spade or clamshell type digging equipment.
.2 Root ball diameter shall be a minimum of 230 mm for each 25 mm caliper size.
.3 Wire basket shall be lined with burlap. Root ball shall be laced and tied to wire basket with heavy rope.
.4 Ensure trunk of tree is not damaged by wire basket, ties or rope.

2.2	**Water**	Delete 2.2.1 and replace with the following	Potable and free of minerals and impurities which are detrimental to plant growth.
2.3	**Fertilizer**	Add 2.3.2	Fertilizer shall be prolonged-release fertilizer tablets containing a minimum of 20% nitrogen, 10% phosphoric acid, and 5% potash (20-10-5) as per Approved Products List. Store in weatherproof storage space.
2.4	**Mulch**	Delete 2.4.1 and replace with the following	Composed mulch shall be 9 mm black/brown in colour with no cedar or redwood bark or wood material as per Approved Products List.
2.5	**Stakes**	Delete 2.5.1 and replace with the following	Stakes shall be pressure treated Hem/Fir, 75 mm dia. round, 2500 mm long. Stake fasteners shall be hot dipped galvanized or stainless steel.
2.8	**Guying Wire**	Delete 2.8.1 and replace with the following	Guyingwire shall be direct burial or screw type disc guy anchor and guy system as per Approved Products List.
2.11	**Anti-Desiccant**	Delete 2.11.1 and replace with the following	Anti-Desiccant shall be wax-like emulsion, as per Approved Products List, that will provide a transpiration reducing film over the plant surface.
2.12	**Flagging Tape**	Delete 2.12.1 and replace with the following	Flagging tape shall be 30mm wide 'Red' PVC flagging tape as per Approved Products List.
2.13	**Tree Trunk Protection**	Add 2.13	.1 Tree trunk protection shall be extrusion mold process, polyethylene with UV protectors as per Approved Products List.
2.14	**Burlap**	Add 2.14	.1 Burlap shall be untreated, free from toxic contaminants and of sufficient strength to hold the rootball in a compact, stable mass that does not move relative to the main stem(s) of the tree or shrub.
2.15	**Wire Baskets**	Add 2.15	.1 Wire baskets shall be non-galvanized metal basket designed and manufactured for the purpose of tree moving. Basket shall be

shaped to ensure that the root ball will allow a stable planting condition in accordance with standards noted.

2.16 Tree Ties — Add 2.16

.1 Tree ties shall be Flat woven polypropylene material. 20 mm wide, 544 Kg, break strength. extrusion mold process, polyethylene with UV protectors as per Approved Products List.

3.0 EXECUTION

3.1 Pre-Planting Operations — Delete 3.1 and replace with the following

.1 Place stakes on site to identify location trees, shrubs and plant beds in accordance to the Landscape Plans.

.2 *Contract Administrator* and the City to review all tree locations and plant bed layout prior to start of plant bed preparation and planting operation.

.3 Anti-desiccant shall be applied only as directed by the *Contract Administrator* and the City. Application of anti-desiccant shall be in accordance with manufacturer's instructions.

.4 Coordinate planting operations with other trades and project schedule.

.5 All planting operations shall be done in a timely manner in accordance to the Planting Schedule.

.6 Planting Schedule shall be updated as required by the *Contractor* to coincide with status of site and coordination with other trades. Provide the *Contract Administrator* and the City with updates to the schedule as required throughout the planting process.

3.2 Subgrade Preparation — Delete 3.2 and replace with the following

.1 The *Contractor* is responsible for confirming the location and extent of existing utilities prior to the start of all planting operations. All attempts should be made to ensure that utility services are maintained to all on and off site parties throughout the entire planting operation.

.2 Tree Pits

- .1 Tree Pit Depth 900 mm minimum.
- .2 Width of tree pit shall be a minimum of 450 mm to 600 mm greater than diameter of the root ball.
- .3 Prior to the placement of growing medium scarify the sides and bottom of tree pits created with a tree spade to eliminate glazed surface.

.3 Ensure tree pits dug in heavy or compacted soils exhibit the ability to drain freely by filling each tree pit with a minimum of 20 litres of water. Water should freely drain through subsoil within ten (10) minutes.

- .1 Notify *Contract Administrator* and the City if tree pits in any soil condition do not drain freely or if tree pit fills with ground water.
- .2 There shall be no standing water in the bottom of tree pit at time of planting.

.4 Protect bottom of tree pit(s) against freezing.

.5 Ensure tree pits and plant beds are kept well drained and free of contaminants and construction debris.

.6 Planting Areas shall be excavated to the following depths:

.1 Shrub beds, perennials, ornamental grasses shall be 450 mm.
.2 Ground covers and annual flowers shall be 300 mm.
.3 Trees shall be 900 mm.

3.3 Planting

Delete 3.3 and replace with the following

.1 Planting operations shall be carried out under conditions that are conducive to healthy, vigorous growth of plant material.

.2 Plant material shall be planted vertical, straight and plumb at locations staked in field and or noted on landscape plans.

.3 Ensure orientation of plant material will give best appearance in relation to views from adjacent buildings, roads, walks or use areas.

.4 Ensure planting depth of root ball is equal to the depth of root ball originally established in the nursery. The top of root ball shall be level with adjacent growing medium.

.5 Ball and Burlap Plant Material: After plant has been lowered into plant bed or tree pit cut away all root ball ties from around trunk. Loosen burlap from around trunk and cut away minimum top 1/3 without disturbing root ball.

.6 Container Grown Plant Material: Remove entire container (including biodegradable containers) without disturbing root ball. Score root ball vertically at six (6) locations evenly spaced around entire root ball to minimize girdling of roots.

.7 Tree Spade Dug Root Balls: Cut wire basket around entire perimeter of root ball. Bend down top 2/3 of wire basket without disturbing root ball. Cut away all root ball ties from around trunk. Loosen burlap from around trunk and cut away minimum top 1/3 without disturbing root ball.

.8 Backfill planting areas in 150 mm lifts to 2/3 of the depth tamping each lift of growing medium around root system to eliminate air voids. Do not use frozen or saturated growing medium for backfill operation.

.9 Prior to placing remaining growing medium, thoroughly water planting areas, fill tree pits with water. Complete backfill operation only after water has completely penetrated into growing medium.

.10 Build 100 mm high by 150 mm wide (4” high by 6” wide) saucer around outer edge of tree pit to assist with maintenance watering.

.11 Tree Stabilization

.1 Guy or stake trees as directed by *Contract Administrator* and the City.
.2 Ensure guy pins and stakes are not placed through the root ball.
.3 Trees that have had root balls penetrated by guy pins and stakes will be rejected.
.4 Tie one (1) to two (2) flagging tape flags to all guy wires at a height that is clearly visible.

.12 Place tree trunk protection around base of tree trunk as per manufacturer instructions.
.1 Trees 100mm caliper or less shall have one protector. Do not interlock ends of tree protector.

.2 Trees greater than 100mm caliper shall have a minimum of two interlocked protectors. Do not interlock outside ends.

.13 Fertilize as per recommendations based on soil testing and place planting tablets at the following rates in prepared planting holes. Spread the tablets in each hole before planting.

	Plant/Container Size	Table Size	Tablets per Plant
.1	Trees	21g	1 per every 1.25mm of trunk caliper
.2	#15/ 45 cm tub	21g	3
.3	#7/ 35 cm tub	21g	3
.4	#5/ 30 cm pot	21g	2
.5	#3/ 27 cm pot	21g	2
.6	#2/ 21 cm pot	21g	1
.7	#1/ 15 cm pot	21g	1

3.4 Tree Support — Delete 3.4 and replace with the following

.1 Guy and stake all trees immediately after planting. Plant material not guyed or staked immediately shall be replaced if damaged.

.2 Drive one (1) stake per tree vertically into the ground to a depth of 750 – 1000 mm, in such a manner so as not to injure the root or root ball.

.3 Fasten tree to the crotch and midway between the crotch and the ground with galvanized wire protected by hose.

.4 Trees to stand plumb upon completion of this operation.

3.6 Pruning — Delete 3.6 and replace with the following

.1 All pruning cuts shall be made with pruning saws or hook and blade pruning tools designed and manufactured for pruning operations. Anvil-type pruning tools shall not be used in any pruning operations.

.2 Prune trees and shrubs after planting operation as directed by *Contract Administrator* and the City.

.3 Prune each tree and shrub planted to preserve the natural character of the plant and in a manner appropriate to its particular requirement in the landscape design. Pruning in general shall be heavier on collected than on nursery-grown plants. Remove all soft wood sucker growth and all broken or badly bruised branches with a clean cut.

.4 Employ clean sharp tools and make cuts without damaging the branch collar.

.5 Do not damage the leader or lead branches. Plants which have had the main leader or lead branches damaged or removed will be rejected and replaced by the *Contractor* at no cost to the *Owner*.

.6 Do not remove minor twig branches along the main structural branches.

3.7 Mulching — Delete 3.7 and replace with the following

1. Prior to the application of composted mulch;

.1 Manually remove all weeds and weed roots from root balls and adjacent growing medium.

.2 Remove all deleterious material and debris from planting areas.

.3 All fine grading shall be completed, the growing medium shall be loose and friable.

.4 The *Contract Administrator* and the City has reviewed of all planting areas.

.2 Spread composted mulch to minimum depth of 50 mm.

.1 Ensure finish composted mulch layer is a minimum of 12 mm below adjacent hard landscape surfaces and edges.

.2 Ensure mulch is kept 125 mm away from tree trunks and 75 mm away from stems of shrubs.

3.8 Clean-up

Delete 3.8 and replace with the following

.1 Growing medium spilled onto pavement and growing medium stains on pavement or adjacent hard surfaces shall be cleaned up immediately.

.2 Remove from the site all pots, cans, surplus materials, and other debris resulting from planting operations.

.3 Ensure complete removal of planting tags, labels, strings, or other materials prior to Substantial Performance.

.4 Neatly dress and finish all planting areas and flush all walks and paved areas clean to the satisfaction of the Consultant and *Owner*.

3.9 Maintenance

Delete 3.9 and replace with the following

.1 Maintenance of plants shall begin immediately after planting operation and shall continue in an uninterrupted fashion until all deficiencies noted in the *Substantial Performance* review have been rectified and the *Contract Administrator* and the City has provided to the *Contractor* written confirmation of the date of *Total Performance*.

.2 If for any reason the *Contractor* elects, on his own without the written consent of the *Contract Administrator* and the City to suspend maintenance operations, the *Contractor* shall provide the *Contract Administrator* and the City written notice of such action. Any damages or requirement for the replacement of plant material that as a result of the suspension of maintenance operations shall be the borne by the *Contractor* at no cost to the *Owner*.

.3 Maintenance of plant material includes but is not limited to watering at intervals sufficient to maintain healthy, vigorous growth, weeding of plant beds and tree pits, cultivating of growing medium, pruning, treatment of insects, molds, fungi or disease to the Level 2 “Groomed’ as per the BCNLA Landscape Standard, Current Edition or as directed by consultant.

.4 Plant material shall be deep watered at least once per day when temperatures exceed 25 degrees Celsius.

.5 Water sufficiently to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.6 Supply equipment such as pumps, portable sprinklers systems, tank trucks, hose and sprinklers required for watering operations. Water trucks, if used for watering operations, must service the site from adjacent roads until irrigation system is operational.

.7 *Contractor* to ensure adequate moisture in plant root zone prior to winter freeze-up.

.8 Reset all plants that have settled to plant depths approved by the *Contract Administrator* and the City prior to the placement of composted mulch.

.9 Ensure tree guards, stakes, flagging tape on tree guy wire and tree ties are kept secure, taught and in proper repair.

3.10 Conditions for Total Performance

Delete 3.10 and replace with the following

.1 Conditions for *Total Performance*:

.1 *Substantial Performance* shall have been granted by the *Contract Administrator* and the City and, Final Inspection at the end of the guarantee/warranty period.

.2 All plant material is healthy; exhibiting signs of vigorous growth and meets the requirements of this specification.

.3 Plant material installed less than ninety (90) days prior to frost will be accepted in following spring, thirty (30) days after start of growing season provided that final acceptance conditions are fulfilled.

.4 Unless otherwise indicated in the *Contract Drawing* the original shape and form of the plant as reviewed by the *Contract Administrator* and the City has been maintained, leaders are intact, there are no wounds or abrasions on trunks or branches.

.5 Mulch has been maintained to specified depths.

.6 All planting areas continue to be free draining with no signs of standing water.

.7 All plant beds are completely free of weeds and noxious grasses.

.2 The *Contractor* shall continue to maintain the work of this section until the *Contract Administrator* and the City provides written confirmation that *Total Performance* conditions have been met.

END OF SECTION

1.00 GENERAL

1.01 Intent

.1 General

.1 It is the intent of this specification to define the acceptable methods and materials for installing water services, sanitary forcemains and sanitary gravity services by the all-terrain horizontal directional drilling method and the requirements for high density polyethylene (HDPE) pipe installed by directional drilling or in open cut trenches.

.2 Installation Plan

.1 At least 7 days prior to mobilizing equipment Contractor shall submit his detailed installation plan to the Contract Administrator. The plan shall include a detailed plan and profile of the bores and be plotted at a scale no smaller than 1 inch equals 20 feet horizontal and vertical.

.2 The plan shall also include a listing of major equipment and supervisory personnel and a description of the methods to be used.

.3 Variations in Plan or Profile

.1 The Contractor may request changes to the proposed vertical and horizontal alignment of the installation and the location of the entry and exit points. Proposed changes shall be submitted in writing to the Contract Administrator and receive approval of the Contract Administrator prior to construction.

.4 Alignment

.1 The proposed plan and profile installation locations are based on alignments to accommodate acquired easements, to avoid obstructions, and to properly maintain operation flow velocities.

2.00 MATERIALS

.1 General

.1 High density polyethylene pipe in accordance with MMCD 33 11 01 2.2.3 in addition to these specifications shall be used in HDD installations. All piping system components shall be the products of one manufacturer and shall conform to the latest edition of ASTM D1248, ASTM D3350, and ASTM F714.

.2 Piping and Bends:

.1 Piping and Bends shall be extruded from a polyethylene compound and shall conform to the following requirements:

.1 The polyethylene resin shall meet or exceed the requirements of ASTM D3350 for PE 3408 material with a cell classification of 335434C, or better.

.2 The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by precompounding in a concentration of not less than two percent.

.3 The maximum allowable hoop stress shall be 5500KPa at 23˚C.
.4 The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacture the pipe in this project.
.5 The pipe and bends shall have a minimum standard dimension ratio (SDR) wall thickness as specified by the Contract Administrator.
.6 Joining shall be performed by thermal butt-fusion in accordance with the manufacturer's recommendations.
.7 Water pipe exterior shall be blue in color or contain blue striping.
.8 Sanitary pipe exterior shall be red in color or contain red striping.
.9 Storm pipe exterior shall be green in color or contain green striping.

.3 Procedures

.1 General:

.1 All polyethylene pipe shall be cut, fabricated, and installed in strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with polyethylene pipe. The pipe supplier shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be on site to oversee the pipe joining. Expense for the representative shall be paid for by the Contractor.

.2 Transportation:

.1 Care shall be taken during transportation of the pipe to ensure that it is not cut, kinked, or otherwise damaged.

.3 Storage:

.1 Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, the pipe shall be stored on wooden leepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

.4 Handling Pipe:

.1 The handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipes. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground. Slings for handling the pipeline shall not be positioned at butt-fused joints. Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe

wall thickness or kinked sections shall be removed and the ends rejoined.

.2 The open ends of all sections of joined and/or installed pipe (not in service) shall be plugged at night to prevent animals or foreign material from entering the pipe line or pipe section.

.3 Waterproof nightcaps of approved design may be used but they shall also be so constructed that they will prevent the entrance of any type of natural precipitation into the pipe and will be fastened to the pipe in such a manner that the wind cannot blow them loose.

.4 The practice of stuffing cloth or paper in the open ends of the pipe will be considered unacceptable.

.5 Where possible, the pipe shall be raised and supported at a suitable distance back from the open end such that the open end will be below the level of the pipe at the point of support.

2.02 Installation

.1 General:

.1 The Contractor shall install the pipelines by means of horizontal directional drilling. The Contractor shall assemble, support, and pretest the pipeline prior to installation in the directional drill tunnel.

.2 Horizontal directional drilling shall consist of the drilling of a small diameter pilot hole from one end of the alignment to the other, followed by enlarging the hole diameter for the pipeline insertion. The exact method and techniques for completing the directionally drilled installation will be determined by the Contractor, subject to the requirements of these Specifications.

.3 The Contractor shall prepare and submit a plan to the Contract Administrator for approval for insertion of the HDPE pipe into the opened bore hole. This plan shall include pullback procedure, ballasting, use of rollers, side booms and side rollers, coating protection, internal cleaning, internal gauging, hydrostatic tests, dewatering, and purging.

.4 The required piping shall be assembled in a manner that does not obstruct adjacent roadways or public activities. The Contractor shall erect temporary fencing around the entry and exit pipe staging areas.

.2 Joining Pipe Sections:

.1 Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately prior to joining.

.2 Pipes shall be joined to one another by means of thermal butt-fusion. Polyethylene pipe lengths to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

.3 Mechanical connections of the polyethylene pipe to auxiliary equipment shall be through flanged connections which shall consist of the following:

.1 A polyethylene “sub end” shall be thermally butt-fused to the ends of the pipe.

.2 Provide ASTM A240, Type 304 stainless steel backing flange, 125-pound, ANSI B16.1 standard, and gaskets as required by the manufacturer.

.3 Stainless Steel bolts and nuts of sufficient length to show a minimum of three complete threads when the joint is made and tightened to the manufacturer’s standard. Retorque the nuts after 4 hours.

.4 Butt-Fusion Joining: Butt-fusion of pipes shall be performed in accordance with the manufacturer’s recommendations as to

equipment and technique. Butt-fusion joining shall be 100% efficient offering a joint weld strength equal to or greater than the tensile strength of the pipe.

.3 Testing:

.1 The pipe shall be hydrostatically tested after joining into continuous lengths prior to installation and again after installation. Pressure and temperature shall be monitored with certified instruments during the test. After this test, the water will be removed with pigs. Erosion prevention procedures will be used during removal and discharge of the water.

.2 Hydrostatic testing shall be performed in accordance with paragraph MMCD 02666 3.19.2. All costs associated with acquiring water for testing shall be included in the established contract unit bid prices.

.4 Tolerances:

.1 Pipe installed by the directional drilled method must be located in plan as shown on the Drawings, and must be no shallower than shown on the Drawings unless otherwise approved. The Contractor shall plot the actual horizontal and vertical alignment of the pilot bore at intervals not exceeding 10 meters. This “as built” plan and profile shall be updated as the pilot bore is advanced. The Contractor shall at all times provide and maintain instrumentation that will accurately locate the pilot hole and measure drilling fluid flow and pressure. The Contractor shall grant the Contract Administrator access to all data and readout pertaining to the position of the bore head and the fluid pressures and flows. When requested, the Contractor shall provide explanations of this position monitoring and steering equipment. The Contractor shall employ experienced personnel to operate the directional drilling equipment and, in particular, the position monitoring and steering equipment. No information pertaining to the position or inclination of the pilot bores shall be withheld from the Contract Administrator.

.2 Each exit point shall be located as shown with an over-length tolerance of 3 meters for directional drills of 300 linear meters or less and 12 meters for directional drills of greater than 300 linear meters and an alignment tolerance of 1.2m left/right with due consideration of the position of the other exit points and the required permanent easement. The alignment of each pilot bore must be approved by the Contract Administrator before pipe can be pulled. If the pilot bore fails to conform to the above tolerances, the Contract Administrator may, at his option, require a new pilot boring to be made.

.3 After the pipe is in place, cleaning pigs shall be used to remove residual water and debris. After the cleaning operation, the Contractor shall provide and run a sizing pig to check for anomalies in the form of buckles, dents, excessive out-of-roundness, and any other deformations. The sizing pig run shall be considered acceptable if the survey results indicate that there are no sharp anomalies (e.g. dens, buckles, gouges, and internal obstructions) greater than 2 percent of the nominal pipe diameter, or excessive ovality greater than 5 percent of the nominal pipe diameter. For gauging purposes, dent locations are those defined above which occur within a span of five feet or less. Pipe ovality shall be measured as the percent difference between the maximum and minimum pipe diameters. For gauging purposes, ovality locations are those defined above which exceed a span of five feet.

.5 Ream and Pullback:

.1 Reaming: Reaming operations shall be conducted to enlarge the pilot after acceptance of the pilot bore. The number and size of such reaming operations shall be conducted at the discretion of the Contractor.

.2 Pulling Loads: The maximum allowable pull exerted on the HDPE pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer so that the pipe or joints are not over stressed.

.3 Torsion and Stresses: A swivel shall be used to connect the pipeline to the drill pipe to prevent torsional stresses from occurring in the pipe.

.4 The lead end of the pipe shall be closed during the pullback operation.

.5 Pipeline Support: The pipelines shall be adequately supported by rollers and side booms and monitored during installation so as to prevent over stressing or buckling during the pullback operation. Such support/rollers shall be spaced at a maximum of 18m on centers, and the rollers to be comprised of a non-abrasive material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline allowing for free movement of the pipeline during pullback. Surface damage shall be repaired by the Contractor before pulling operations resume.

.6 The contractor shall at all times handle the HDPE pipe in a manner that does not over stress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 50% of yield stress for flexural bending of the HDPE pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense. The Contractor shall take appropriate steps during pullback to ensure that the HDPE pipe will be installed without damage.

.6 Handling Drilling Fluids and Cuttings:

.1 During the drilling, reaming, or pullback operations, the Contractor shall make adequate provisions for handling the drilling fluids, or cuttings at the entry and exit pits. To the greatest extent practical, these fluids must not be discharged into the waterway. When the Contractor's provisions for storage of the fluids or cuttings on site are exceeded, these materials shall be hauled away to a suitable legal disposal site. The Contractor shall conduct his directional drilling operation in such a manner that drilling fluids are not forced through the subbottom into the waterway. After completion of the directional drilling work, the entry and exit pit locations shall be restored to original conditions. The Contractor shall comply with all permit provisions.

.2 Pits constructed at the entry or exit point area shall be so constructed to completely contain the drill fluid and prevent its escape to the beach or waterway.

.3 The Contractor shall utilize drilling tools and procedures which will minimize the discharge of any drill fluids. The Contractor shall comply with all mitigation measures listed in the required permits and elsewhere in these Specifications.

.4 To the extent practical, the Contractor shall maintain a closed loop drilling fluid system.

.5 The Contractor shall minimize drilling fluid disposal quantities by utilizing a drilling fluid cleaning system which allows the returned fluids to be reused.

.6 As part of the installation plan specified herein before, the Contractor shall submit a drilling fluid plan which details types of drilling fluids, cleaning and recycling equipment, estimated flow rates, and procedures for minimizing drilling fluid escape.

2.03 Drilling Operations

.1 General:

.1 The Contractor shall prepare a plan to be submitted for Contract Administrator approval which describes the noise reduction program, solids control plant, pilot hole drilling procedure, the reaming operation, and the pullback procedure. All drilling operations shall be performed by supervisors and personnel experienced in horizontal directional drilling. All required support, including drilling tool suppliers, survey systems, mud cleaning, mud disposal, and other required support systems used during this operation shall be provided by the Contractor.

.2 Drill pipe shall be API steel drill pipe, Range 2, Premium Class or higher, Grade S-135 in a diameter sufficient for the torque and longitudinal loads and fluid capacities required for the work.

.3 Only drill pipe inspected under API's Recommended Practice Specification API RP 7G within 30 days prior to start and certified as double white band or better shall be used.

.4 A smoothly drilled pilot hole shall follow the design centerline of the pipe profile and alignment described on the construction drawings.

.5 The position of the drill string shall be monitored by the Contractor with the downhole survey instruments. Contractor shall compute the position in the X, Y and Z axis relative to ground surface from downhole survey data a minimum of once per length of each drilling pipe (approximately 10m interval). Deviations from the acceptable tolerances described in the Specifications shall be documented and immediately brought to the attention of the Contract Administrator for discussion and/or approval. The profile and alignment defined on the construction drawings for the bores define the minimum depth and radius of curvature. At no point in the drilled profile shall the radius of curvature of the bore be less than 485m. The Contractor shall maintain and provide to the Contract Administrator, upon request, the data generated by the downhole survey tools in a form suitable for independent calculation of the pilot hole profile.

.6 Between the entry or exit point the Contractor shall provide and use a separate steering system employing a ground survey grid system, such as "TRU-TRACKER" or equal wherever possible. The exit point shall fall within a rectangle 3 meters wide and 12 meters long centered on the planned exit point.

.7 During the entire operation, waste and leftover drilling fluids from the pits and cuttings shall be dewatered and disposed of in accordance with all permits and regulatory agencies requirements. Remaining water shall be cleaned by Contractor to meet permit requirements.

.8 Technical criteria for bentonite shall be as given in API Spec. 13A, Specification for Oil Well Drilling Fluids Material for fresh water drilling fluids. Any modification to the basic drilling fluid involving additives must describe the type of material to be used and be included in Contractor's drilling plan presented to the Contract Administrator. The Owner retains the right to sample and monitor the waste drilling mud, cuttings and water.

.2 Environmental Provisions:

.1 The Horizontal Directional Drilling operation is to be operated in a manner to eliminate the discharge of water, drilling mud and cuttings to the adjacent ditches or land areas involved during the construction process. The Contractor shall provide equipment and procedures to maximize the recirculation or reuse of drilling mud to minimize waste. All excavated pits used in the drilling operation shall be lined by Contractor with heavy duty plastic sheeting with sealed joints to prevent the migration of drilling fluids and/or ground water.

.2 The Contractor shall visit the site and must be aware of all structures and site limitations at the directional drill crossing and provide the Contract Administrator with a drilling plan outlining procedures to prevent drilling fluid from adversely affecting the surrounding area.

.3 The general work areas on the entry and exit sides of the crossing shall be enclosed by a berm to contain unplanned spills or discharge.

.4 Waste cuttings and drilling mud shall be processed through a solids control plant comprised as a minimum of sumps, pumps, tanks, desalter/desander, centrifuges, material handlers, and haulers all in a quantity sufficient to perform the cleaning/separating operation without interference with the drilling program. The cuttings and excess drilling fluids shall be dewatered and dried by the Contractor to the extent necessary for disposal in offsite landfills. Water from the dewatering process shall be treated by the Contractor to meet permit requirements and disposed of locally. The cuttings and water for disposal are subject to being sampled and tested. The construction site and adjacent areas will be checked frequently for signs of unplanned leaks or seeps.

.5 Equipment (graders, shovels, etc.) and materials (such as groundsheets, hay bales, booms, and absorbent pads) for cleanup and contingencies shall be provided in sufficient quantities by the Contractor and maintained at all sites for use in the event of inadvertent leaks, seeps or spills.

.6 Waste drilling mud and cuttings shall be dewatered, dried, and stockpiled such that it can be loaded by a front end loader, transferred to a truck and hauled offsite to a suitable legal disposal site. The maximum allowed water content of these solids is 50% of weight.

.7 Due to a limited storage space at the worksites, dewatering and disposal work shall be concurrent with drilling operations. Treatment of water shall satisfy regulatory agencies before it is discharged.

3.1 Measurement and Payment

.1 Payment for Horizontal Directional Drilling will include installation of all material supplied, pit preparation (entrance, exit, and all pits as required to complete the work), disposal of all native and drilling materials, fusing of HDPE pipe, supply and installation of all materials and fittings required, cleaning, testing, flushing and disinfection, surface restoration, and all work, equipment and materials necessary to complete the installation as shown on the Contract Drawings, and specified under this section. Measurement for sanitary sewer and sanitary forcemain installed by HDD will be made along centre line of the main, over the surface after work has been completed, from start of new pipe to end of pipe installation.

.2 The owner has pre-ordered the HDPE pipe only, not including fittings, to address lead time on pipe materials. Once the pipe has arrived at the supplier's yard, the Contractor will assume all responsibility for pipe delivery to site, handling, protecting, fusing, stockpiling and security of the pipe on site, and all other works incidental to pipe supply and installation. The Owner transfers all risk of pipe delivery, scheduling etc. to the Contractor once the Contract between the Contractor and Owner is in place and the pipe has been delivered to the Suppliers yard.

END OF SECTION

1.8	**Measurement and Payment**	Delete 1.8.2 and replace with the following	Payment for watermain will include location and exposure of existing utilities, saw cutting and disposal of pavement, trench excavation, disposal of surplus / displaced excavated material, support of utility poles and adjacent piping, supply and installation of all pipe, bends, bolts, gaskets, thrust blocks, couplings, restraints and tie rods, all nuts, bolts and fasteners to be 304 stainless steel or better, application of petrolatum mastic on all metal but non stainless water appurtenances, blind flanges, caps, fittings and related materials, tie-ins, bedding, approved native excavated backfill material compacted in place, , cleaning, pressure and leakage testing including all labor, material and equipment required to complete the test, flushing, disinfection where required, granular sub-base, granular base, all surface restoration as specified under Section 31 23 01 – Sub-section 3.6, COQ-G4 and all other work and materials necessary to complete installation as shown on Contract Drawings, as described in Schedule of Quantities and Prices, and as specified under this Section; Payment includes import backfill in pipe zone as specified in COQ G4; and Payment includes pre-determining of existing watermain OD by Contractor prior to start of work for proper joint restraint sizing. Measurement for watermain will be made along the centerline of the main, through the valves and fittings, with no deduction for length of valve or fittings, over surface after work has been completed, from start of new pipe to end of pipe installation; and Native excavated material approved for re-use as trench backfill shall be at the sole discretion of the Contract Administrator. All cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density.
		Delete 1.8.3 and replace with the following	Payment for inline gate valves or butterfly valves including Terminal City Nelson Type valve boxes, restraints; and for fittings (crosses, tees, bends, reducers, blind flanges, caps, anchors and etc.) will be made for items identified on Contract Drawings and installed as part of watermain as described under 1.8.2 in this Section. Payment for fittings, unless specified in the Schedule of Quantities and Prices, performed under this section will be incidental to payment for work described in other Sections. Measurement will be for each respective item installed without deduction of length of valves and fittings from length of pipe measured for payment under 1.8.1 and 1.8.2 in this Section.
		Delete 1.8.4 and replace with the following	Payment for new, renewal, transfer and capping of service connection includes locating and cutting the existing service supply, removal and disposal of concrete meter box, curb stop, piping and meter (where applicable), supply and installation by direct tapping, corporation stops, gate valve, reconnecting to the existing main using a MacDonald compression coupling (“funny nut”), curb stops, service pipes, saddles and all related fittings and appurtenances specified and/or shown on Standard Detailed Drawing COQ-W2a (except where noted), COQ-W2k, COQ-W2d, WM-3, COQ-WM-5, COQ-W2e,

	COQ-W2b-1, COQ-W2b-2, COQ-W2f, new meter and appurtenances, all labor, material and equipment including use of tapping machine and reconnecting to the existing service at or near property line or as shown on the Contract Drawings including any fittings and repair couplings. Payment also includes all applicable work described in 1.8.2. Measurement for service connection will be for each complete service installed, including all appurtenances, length of service pipe installed and length of riser. Payment includes re-use of existing cast iron Terminal City Nelson Type style valve box c/w lid marked "WATER" and supply and installation of new pvc riser.
Delete 1.8.5 and replace with	Payment for air-release and combination air valves and apparatus includes all materials, works, and appurtenances shown on Coquitlam Standard Detail Drawing COQ-W6 including manhole barrels, frames, and covers marked with "Coquitlam Water". Payment includes all applicable work described in 1.8.2 of this section.
Delete 1.8.7 and replace with the following	Payment for supply and installation of a new blow-off assembly includes supply and installation of all materials, works and appurtenances as shown on the Contract Drawings. Payment includes all applicable work described in 1.8.2. Measurement will be made at the lump sum price bid for each blow-off assembly installed.
Delete 1.8.13 and replace with the following	Payment for all tie-ins to existing watermains will include all pipe materials, tapping tee and valve, fittings, water meter, test points, blow off assembly, joint restraints, excavation to expose the existing main to confirm location, grade, size, material & condition and prepare the existing watermains, couplers, caps, restraints, tie-rods, all nuts, bolts and fasteners to be 304 stainless steel or better, application of petrolatum mastic on metal but non stainless water appurtenances, bedding and backfill material on pipe zone, testing and disinfection, cutting and disposal of the existing mains, permanent capping c/w restraints, removal of any decommissioned valves boxes, removal of any decommissioned valves and fittings to accommodate the new and existing main, temporary fittings to provide service changeovers and coordinating all tie-in works with City Staff and as described on the Contract Documents and Drawings. Payment includes all applicable work described in 1.8.1 and 1.8.2.
Add 1.8.14	Payment for water meter box and service connection includes mainline double strap saddles, precast box, live tap, gate valve, corporation stops, curb stops, service pipes, and all related fittings and appurtenances specified and/or shown on per COQ-W2e and WM-3, as applicable, trench excavation, on-site reuse of surplus/displaced material, supply and installation of all pipe, compression fittings and adapter, and related materials, bedding, native backfill, import backfill, testing (if applicable),flushing, disinfection, and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Payment includes all applicable work as described in Section 32 84 23S, Irrigation System.

Native excavated material approved for re-use as trench backfill shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density.

Measurement for water meter and service connection will be for each complete service installed, with no regard to length of service pipe installed.

Add 1.8.15

Payment for new hydrants installed on the new main includes the hydrant body, c/w Storz "quick connect" pump nozzle, lateral connections from mainline tee off watermain to hydrants, all new pipe, isolation gate valve, valve box & cover, valve stem riser pipe, bends, couplings (Robar 1506), any necessary pipe extensions to achieve the required hydrant height, concrete thrust block, tie rods, bedding material, testing and disinfection, surface restoration as indicated in the requirements in 1.8.2 of this Section and all other incidental work as shown on MMCD Standard Detail Drawing W4.

Measurement will be made at the unit price bid for each hydrant assembly installed.

2.0 PRODUCTS

2.2 Mainline Pipes, Joints and Fittings

Add to 2.2.1.1

Pipe: to AWWA C151, and shall meet the following Pressure Class or Thickness Class:

.1 100 mm – 350 mm – Thickness Class 50
.2 400 mm & greater – PC 350

Delete 2.2.2.2 and replace with the following

Joints: It is mandatory that the push-on integrally thickened bell and spigot type conform to ASTM D3139 Clause 6.2 with single elastomeric gasket to ASTM F477.

Delete 2.2.4.13 and replace with the following

Joint Restrain Devices: General Requirements:

.1 Ductile iron castings to ASTM A536.
.2 Anti-corrosion coating of ductile iron castings to AWWA C219, AWWA C210, AWWA C213 or AWWA C550.
.3 Bolts and nuts high strength low alloy steel to AWWA C111 or as specified in Contract Documents, stainless steel to ASTM F593 or ASTM F738 for bolts and ASTM F594 or ASTM F836 for heavy hex nuts. Rolled threads, fit and dimensions to AWWA C111.
.4 Tie rods to 2.2.3.8 of this Section
.5 Restrainers for ductile iron pipe shall be mechanical joint fittings or push-on joint fittings with tie rod.
.6 Restrainers for PVC pipe shall be mechanical joint fittings or push-on joint fittings with tie rod lugs.
.7 Restrained harnesses or integral restrain systems manufactures as part of the pipe joint.
.8 All joint restraint systems for PVC pipe be approved by the specific PVC pipe manufacturer, and that they do not derate the pipe manufacturer's recommended working pressures.
.9 Restrainers for PVCO pipe shall be mechanical joint fittings or push-on joint fittings with tie rod lugs.

			.10 All joint restraint systems for PVCO pipe be approved by the specific PVCO pipe manufacturer, and that they do not derate the pipe manufacturer's recommended working pressures.
		Add 2.2.7	Oriented Polyvinyl (PVC) Pressure Pipe: .1 Pipe: .1 Pipe to be manufactured to specifications for pipe size ranges as follows: .1 Pipes 100 to 600 mm diameter – AWWA C909. .2 Pipes to be certified by Canadian Standards Association for pipe size ranges 100 mm to 600 mm dia. – CSA B137.3.1. .2 Cast iron pipe equivalent outside diameter. .3 To be compatible with specified mechanical joint and push-on joint fittings and valves without use of special adapters. .2 Joints: Push-on integrally thickened bell and spigot type to AWWA C909 Clause 4.3.3.2 (a.) with single elastomeric gasket to ASTM F477.
2.3	**Valves and Valve Boxes**	Delete 2.3.1.3 and replace with the following	Valves 400 mm and larger shall be butterfly valves.
		Delete 2.3.1.4	
		Delete 2.3.4 and replace with the following	Blow-Down or Blow-Off Valves: 50 mm to 300 mm as specified for mainline gate valves.
		Delete 2.3.6.1.1	
		Delete 2.3.6.1.2 and replace with the following	Circular type valve box shall be Nelson style cast iron.
		Delete 2.3.7.1 and replace with the following	Curb stop valve boxes on 19 mm dia. to 38 mm dia. shall be as shown on Coquitlam Standard Detail Drawings COQ-W2b, COQ-W2j.
		Delete 2.3.7.2	
		Delete 2.3.7.3 and replace with the following	Curb stop valve boxes (300 mm from property line) alternative on 19 mm dia. to 38 mm dia. services without operating rods to be assembled as specified for Mainline Valve Boxes 2.3.6.1.2, and shown on Coquitlam Standard Detail Drawings COQ-W2b, COQ-W2j. Service boxes may be Nelson style PVC, except when located in driveways.
		Delete 2.3.7.5 and replace with the following	Corporation stop valve boxes (at mainline tees or tappings) on services 50 mm dia. and larger as specified for Mainline Valve Boxes per Coquitlam Standard Detail Drawings COQ-W2e, COQ-W2f.
2.5	**Service Connections, Pipes, Joints and Fittings**	Delete 2.5.1 and replace with the following	Pipe diameter 19 mm to 75 mm to be Type K annealed copper to ASTM B88M.

2.6	**Hydrants**	Delete 2.6.1.6 and replace with the following	Pump nozzle shall be "quick connect" STORZ type. STORZ type nozzle must be painted gloss black.
		Delete 2.6.2 and replace with the following	Colour: Tremclad Rust Paint Body – Fire Red Hose Caps and Bonnet – Bright Yellow
2.8	**Granular Pipe Bedding and Surround Material**	Add 2.8.3	Bedding and surround material shall be Type 1 under Section 31 05 17 – 2.7 or 19 mm minus clear crushed gravel.
3.0	**EXECUTION**		
3.6	**Pipe Installation**	Add 3.6.15	When the watermain crosses a storm or sanitary sewer, the watermain shall be installed a minimum 0.5 m clear above the sewer. Where this is not possible, the watermain shall have a minimum 0.3 m clearance under the sewer with all joints within a 3.0 m horizontal distance from the sewer wrapped with heat shrink plastic or packed and wrapped with petrolatum tape in accordance to the following standards: .1 ANSI/AWWA C214 (factory applied) .2 ANSI/AWWA C209 (field applied) .3 ANSI/AWWA C217-90 (petrolatum tape) .4 All materials used are to have zero health hazard Installation shall be in accordance with the requirements of the Regional Health Engineer under the Health Act.
3.10	**Service Connection Installation**	Delete 3.10.4	
		Delete 3.10.5 and replace with the following	Tappings in cast iron or ductile iron mains to AWWA CISI pipe to be made using double strap saddles specified in 2.5.3 of this Section.
		Add 3.10.13	Water service connections (19 mm and 25 mm) must be installed as one continuous length of pipe.
3.18	**Cleaning and Preliminary Flushing**	Add 3.18.5	Water mains 400 mm and larger shall be swabbed as per the following procedure: 1. <u>Purpose and Scope</u> .1 To remove any possible contaminants introduced into the water main through pipe storage or installation activities. 2. <u>Swab Requirements</u> .1 Swabs are to be of a polyurethane foam construction, minimum 2 lb/ft3 density .2 Swabs are to be new. Used swabs will not be accepted. .3 Swab outside diameter must be minimum 1 nominal size larger than the largest diameter main to be swabbed (eg. 150 mm main requires minimum 200 mm diameter swabs) .4 Swab length must be minimum 1.5 times the outside diameter. 3. <u>Swab Entry Point</u>

.1 2 swabs are to be inserted into the beginning of the first length of water main installed into the trench. Swabs are to have a minimum of 1-meter separation between them.
.2 Minimum 300 grams of calcium hypochlorite granules are to be installed in between the 2 swabs.

4. Swab Discharge Point
.1 Swabs are to be discharged from the water main at the end of the installation (i.e.-permanent or temporary dead end)
.2 A temporary connection for a discharge assembly of minimum 150 mm (100 mm is acceptable for 100 mm water main only) is to be made to the end of the new water main pipe (connection to a blow off assembly is not acceptable).
.3 The discharge assembly must consist of a 90-degree elbow and appropriate fittings to adapt to 150 mm "camlock" style layflat hose. The assembly must have adequate thrust protection to avoid blowing off during the swabbing procedure.
.4 The 150 mm layflat hose must extend above the surface of the existing ground.

5. General Swabbing Requirements
.1 Swabbing to be performed after the satisfactory completion of all pipe work (as determined by the city inspector), and prior to flushing, pressure testing, and chlorination of the new water main.
.2 Swabbing of the water main is to be witnessed by the City of Coquitlam.
.3 Although a minimum of 2 swabs must be used for each run, additional swabs may be required depending on the time required for the water to run clear after swab discharge. This determination will be made by the City of Coquitlam.
.4 Swabs are to be used once only. Additional new swabs will be required for additional swab runs if deemed necessary by the city.
.5 Swabs must be stored and handled hygienically.
.6 The contractor must provide all labour and materials required to carry out the swabbing procedure.
.7 Swabbing should be completed from a low point to a high point where possible.
.8 A plan to complete the swabbing must be submitted to the City of Coquitlam prior to the work taking place for approval.
.9 The contractor must take all necessary action to prevent flooding of the discharge area.

6. Swabbing Procedure
.1 The length of main within the swabbing run must have all connections larger than 25 mm isolated by closing appropriate valves.
.2 The new main is to be filled and swabs propelled via a certified backflow prevention device (double check valve assembly) and water meter from the existing system. The connection to the existing system will form part of the plan submitted to the city for approval.

.3 Appropriate flow is to be used to propel the swabs at approximately .75 meter per second velocity. See following list for appropriate flow:

Main diameter (mm)	Approximate flow required to produce 0.75 m/s velocity (l/s)
100	6.3
150	12.6
200	25.2
250	37.9
300	56.8
600	227.2

.4 Upon discharge of the swabs, the main must be flushed until the water runs clear.

.5 The supply point can then be slowly closed.

.6 Additional swabs must be run through the water main if excessive debris is noted to be discharged from the main or there is excessive clean up time after the swabs are discharged.

3.23 Connection to Existing Mains

Delete 3.23.1 and replace with the following

Connections to existing waterworks systems will be made by the Contractor under the supervision of the Contract Administrator. Make all necessary arrangements with the Contract Administrator and the City to schedule work to prevent construction delays.

Add 3.23.2

Provide written notification to all affected residents a minimum 48 hours prior to service interruption.

Add 3.23.3

Arrange shutdown of the existing valves by the City. *Contractor* shall not operate any valves without prior approval of the *Contract Administrator* and the City.

Add 3.23.4

Provide temporary water service while existing service is interrupted as detailed in *Contract Drawing* or Project Specific Specifications.

Add 3.23.5

Fittings used for tie ins should be cleaned of all foreign material and sprayed with a 1% hypochlorite solution prior to assembly. Disinfect all pipes and fittings installed at the connection.

Add 3.23.6

Contractor shall be responsible for the costs for the City to flush and purge all air from existing mains and services in the area affected by the water service interruption.

Add 3.23.7

Procedures for Bacteriological Tests shall be as described in AWWA C651-99. No connection to existing watermains will be authorized until final results of coliform bacterial testing have been received and reviewed by the Water Superintendent.

All samples shall be taken by the City Water Utility.

All valve operation shall be handled by the City Water crews.

The *Contractor* shall provide sampling points, one every 366m plus the end of each main segment. The *Contractor* shall provide all labour to temporarily connect and disconnect the new main in order to properly acquire test samples.

Initial flushing, testing and chlorination will be undertaken by the *Contractor* from a water source approved by the Water *Superintendent*.

Coordination for the bacterial testing and tie in shall be coordinated by the project Engineering Inspector and the Water *Superintendent* prior to final flushing.

The *Contract Administrator* shall review with the Water *Superintendent* and the *Contractor* sampling locations and appurtenances.

The *Contract Administrator* shall check and record chlorine residual prior to final flushing.

After final flushing the City Water crew will collect two sets of samples 24 hours apart. Samples will be taken at least every 366m of the new main as well as the terminus and all branches.

Test results will be delivered to the Water Superintendent who will provide a copy to the Contract Administrator.

The Water *Superintendent* will judge the adequacy of the test results and issue an authorization to connect.

City Water crews will provide shutdown and flushing as required.

3.25 Permanent Capping of Existing Water Service Connections

Add 3.25

Permanent capping of existing water service connections to be completed as per Coquitlam standard Detail Drawings COQ-W2g, COQ-W2h, COQ-W2i.

END OF SECTION

1.0 GENERAL

1.6	**Measurement and Payment**	Delete 1.6.1 and replace	Payment for sanitary sewer will be made separately for various sections of sanitary sewer consistent with pipe materials, diameters and backfill requirements shown on the Contract Drawings and described under individual payment items in the Schedule of Quantities.
		Delete 1.6.2 and replace with	Payment for sanitary sewers includes asphalt & concrete saw cutting, disposal of pavement and concrete, trench excavation, shoring as required, disposal of surplus excavated material, removal and disposal of existing pipes, dewatering, removal and disposal of boulders not greater than 1 cubic meter, permanent plugs & caps, supply and installation of all pipe, fittings and related materials, tie-ins other than noted in Clause 1.6.7, bedding material, approved backfill material compacted in place, granular base, granular Subbase, cleaning and flushing, pressure testing, video inspection, all surface restoration under Section 31 23 01 – Sub-section 3.6 including top soil, sod, asphalt and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Payment does not include items that are part of the work and already paid in other Sections; Payment includes import backfill in pipe zone as specified in COQ G4; and Payment includes protecting the existing pavement outside of the utility trench. Repair and replacement of damaged asphalt outside of the utility trench will be at the Contractor's cost as determined by the Contract Administrator unless otherwise specified; and Payment for restoration of driveways, curbs, and curb & gutter will be considered as incidental unless shown otherwise in the Schedule of Quantities. Native excavated material shall only be used at the sole discretion and prior approval of the Contract Administrator as trench backfill for boulevard and outside of paved roadway area and shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free of organic materials. Native excavated material shall not be used as trench backfill where the moisture content does not permit compaction to the specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density and paid under 31 23 01s Subsection 1.10.9; and Payment includes by-pass pumping (and dewatering) and include all pumps, labour and materials required to facilitate the work without any service disruption to property owners. Payment for the by-pass pumping (and dewatering) will be incidental unless shown otherwise in Schedule of Quantities. Payment includes removal and disposal of roots, vegetation, organic matter and stumps that are located in the right of way and which fall within the work area. Trim small branches from trees or hedges as required and where necessary use an approved tree paint to repair damage to surviving vegetation where branches have been removed; and Payment includes support of poles if necessary and manhole barrel preparation to accommodate the service connection.

			Measurement for sanitary sewer will be made horizontally from manhole centreline to manhole centreline over surface after work has been completed. **NOTE: PAYMENT FOR ANY SANITARY SEWER WORKS WILL NOT BE MADE UNTIL RESTORATION WORK IS COMPLETE TO CITY'S SATISFACTION.**
		Delete 1.6.3 and replace with	Payment for new service connections includes 150mm SDR28 and 200mm SDR35 PVC pipe, shear band couplers, bends, increaser, pvc wye, stubs, caps, Le-Ron inspection chamber as per MMCD S7 and S9 c/w locking collar and red lid, bedding and all import backfill material and all related fittings and components specified and/or shown on Standard Detail Drawings. Payment includes all applicable service pipes, materials and work described in 1.6.2. Brooks Boxes with a steel lid are to be provided for all inspection chambers. Payment for the Brooks Boxes will be incidental. Restore all trench cuts across roadways/driveways with a temporary hard surface approved by the *Contract Administrator* following pipe excavation if paving is not scheduled to take place within 24 hours. Refer to Section 32 12 16S for pavement restoration requirements for each road. Payment includes support of poles if necessary and manhole barrel preparation to accommodate the service connection. Payment will be made per the unit price bid for each sanitary service connection.
		Add to Clause 1.6.7	Payment includes all applicable works, labor, material and equipment as described in Clause 1.6.2
2.0	**PRODUCTS**		
2.5	**Granular Pipe Bedding and Surround Material**	Add 2.5.3	Pipe bedding shall be 19 mm clear crushed rock or as approved by the Contract Administrator. Surround material above the springline within the pipe zone may be Type 2.
3.0	**EXECUTION**		
3.8	**Connections to Existing Mainline Pipes**	Delete 3.8.1 and replace with	Connections with two sizes smaller or less to existing mainlines shall be made by removal of the section of the main and replacement with a manufactured PVC wye complete with stubs and double hub PVC couplings for PVC mains and approved shear band couplings for other mainline materials. The contractor shall video inspect all connections to existing mains following completion of installation.

END OF SECTION

1.6	**Measurement and Payment**	Delete 1.6.1 and replace with the following	Payment for storm sewer will be made at the unit price bid for storm sewer (regardless of depth) consistent with pipe materials, diameters and backfill requirements shown on the Contract Drawings and described under individual payment items in the Schedule of Quantities.
		Delete 1.6.2 and replace with the following	Payment for storm sewers includes location and exposure of existing utilities, saw cutting pavement, trench excavation, dewatering, bypass pumping, disposal of all surplus excavated material, disposal of existing storm pipe, support of adjacent piping, supply and installation of all pipe, fittings and related materials, tie-ins to existing storm pipe, re-benching existing manholes as necessary, ramping, existing catchbasin or lawn basin lead tie-ins to new storm, construction joints, bedding, temporary asphalt patching, temporary surface restorations, import backfill, native backfill, granular base, granular subbase, cleaning and flushing, testing (if applicable), videoing and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Measurement for storm sewer will be made horizontally from manhole centerline to manhole centerline over surface work has been completed. Native excavated material approved for re-use as trench backfill shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density.
		Delete 1.6.5 and replace with the following	Payment for catchbasin or lawn basin leads include all applicable materials and work described in 1.6.2 Measurement for catchbasin leads or lawn basin leads will be made horizontally from centreline of catchbasin or lawn basin to terminus of work for each pipe size installed with no regards to depth range.
2.0	**PRODUCTS**		
2.2	**PVC Pipe, Mainline Smooth Wall**	Delete 2.2.1 pipe size ranges and replace with the following	200 mm dia. – 375 mm dia. to ASTM D3034 450 mm dia. – 1,200 mm dia. to ASTM F679
2.3	**PVC Pipe, Mainline Profile**	Delete 2.3	
2.6	**Service Connections**	Delete 2.6.1 and replace with the following	Storm service connections to be PVC DR 28 150 mm diameter minimum or as specified on *Contract Drawings*.
		Delete 2.6.8.1	
		Delete 2.6.8.2 and replace with the following	Connections to PVC pipe to be made with a performed wye fitting where mainline pipe is 300 mm diameter or smaller. For connections to PVC mainline pipe larger than 300 mm diameter an insertable tee for PVC pipe is permitted.

		Add 2.6.8.3	Insertable tee fitting shall have a rubber collar which inserts into the mainline pipe to form a tight seal and shall have stainless steel band to secure the tee insert. The tee insert shall be a standard bell end with depth control lugs. The joint shall provide a minimum seal of 90 kPa on concrete and polyethylene pipe, and 190 kPa on PVC pipe.
2.9	**Granular Pipe Bedding and Surround Material**	Delete 2.9.3	Pipe bedding shall be 19 mm clear crushed rock or as approved by the *Contract Administrator* and the City.
3.0	**EXECUTION**		
3.8	**Connections to Existing Mainline Pipe**	Delete 3.8.3 and replace with the following	For new connections to existing, smooth wall or profile, mainline sewers 300 mm and smaller, shall be made by removal of the section of the main and replacement with a preformed PVC wye fitting complete with stubs and double hub PVC couplings for PVC mains and approved shear band couplings for other mainline materials. For new connections to existing mainline greater than 300 mm, use of insertable tee will be permitted.
3.10	**Service Connection Installation**	Delete 3.10.3 replace with the following	Inspection chambers shall be provided on all storm service connections as per Standard Detail Drawing S7. If inspection chamber is located in driveway, lane, or paved surface, Series 37 Brooks concrete box with lid shall be installed as per Standard Detail Drawing S9.
3.12	**Inspection and Testing**		The contractor shall video inspect completed storm sewers under 900 mm in diameter and all service connections following completion of the installation. The video inspection report shall be in a form specified by the Contract Administrator and the City. Copies of the video DVD and written report shall be forwarded to the Contract Administrator and the City. Refer to Section 33 01 30.1 and 33 01 30.1S CCTV Inspection of Pipelines.
3.16	**Permanent Capping of Service Connections**	Add 3.16.1	Permanent capping of existing storm sewer connections to be completed as per Coquitlam Standard Detail Drawing COQ-S18.
		Add 3.16.2	A trenchless method of permanently capping a service may be required on an arterial road or on a road which has been paved within 5 years, as directed by the Manager. The trenchless technology used to cap the service must be approved by the Manager.

END OF SECTION

1.5	**Measurement and Payment**	Delete 1.5.2 and replace with the following	Payment for all work under this Section and as shown on Contract Drawings will be as described under individual payment items in Schedule of Quantities and Prices. Payment under this item includes concrete box culverts,PVC pipe culvert, saw cutting pavement where necessary, excavation, disposal of surplus excavated material, supply of all pipe, fittings, couplers and related materials, fusing of HDPE pipe culverts, cleaning, all surface restoration, tie-ins and all other work and material necessary to complete the installation as shown on the Contract Documents and specified under this Section. Payment includes placing EPS Rigid Styrofoam on culvert as shown on Drawings. Pipe bedding shall be 19 mm clear crushed rock or as approved by the *Contract Administrator* and the City. Payment for 19mm clear crush and road mulch (minimum 150mm), for bedding and import backfill, will be incidental. Measurement for pipe culverts will be made horizontally from end to end of the culvert after the work has been completed.
		Add 1.5.7	Payment for removal and disposal for all types and sizes of pipe culverts will include complete off-site disposal and restoration of all surfaces as shown on Contract Drawings.
		Add 1.5.8	Payment would include complete installation including restoration of channel bed gravel complete. StormRax – round – 60inches distributed by Armtech or equivalent.

END OF SECTION

1.0 GENERAL

1.1	**Related Work**	Add 1.1.6	Hot Mix Asphalt Concrete Pavement	Section 32 12 16
		Add 1.1.7	Portland Cement Concrete Paving	Section 32 13 13

1.5 Measurement and Payment

Delete 1.5.1 and replace with the following

Payment for manholes will be made by items or components installed for each type and size as shown on Contract Drawings and specified in the Schedule of Quantities and Prices. No payment will be made for excavation and all other associated work required to accommodate manhole in the new sewer system constructed under this Contract for which manhole forms a part; and

Delete 1.5.1.1 and replace with the following

Payment for manhole includes supply and installation of pre bench gasketed base, lid, slab, donut ring, concrete frame, metal frame, cover and all as shown on Contract Drawing and as described on Standard Detail Drawing S1 and S2 for manholes except for riser. Payment includes base preparation, dewatering, all in-situ concrete work, manhole base preparation to accommodate new sewer installation c/w rubber resilient seat gasket, import backfill, granular subbase and base, compaction, all labor, material, equipment and necessary work for installing the manhole.

Delete 1.5.1.2 and replace with the following

Payment for manhole riser sections includes supply and installation of standard and non-standard heights required to complete manhole from specified invert to finishing level, and all necessary work as shown on Contract Drawing and as described on Standard Detail Drawing S1 and S2 for manholes. Payment includes aluminium or non-slip ladder rung, all in-situ concrete work, import backfill, compaction, all labor, material, equipment and necessary work for installing the manhole; and

Measurement will be made vertically for the length of the riser required from the top of the manhole base or tee section to reach the underside of concrete lid or slab.

Add to Clause 1.5.1.5

Payment for outside drop manhole includes excavation, import backfill, compaction, tie-in to existing sanitary main, shear band couplers, pipe stubs, fittings, all in-situ concrete work and all necessary work as shown on Contract Drawing and as specified in the Schedule of Quantities and Prices.

Delete 1.5.3 and replace with the following

Adjustment & Replacements of tops of existing units will be measured in units adjusted as defined below and paid for under their respective Items in the Schedule of Quantities.

No payment will be made under these items for cleaning Valve Boxes, Monument Boxes, Frames, Covers and Lids of Castings as part of the operation for asphaltic concrete paving.

No Payment will be made for Monument Boxes, Lawn Drains, Cleanouts and Inspection Chambers, these adjustments will be treated as incidental work.

All manholes and valve boxes must be vertically adjusted a minimum of twenty-four (24) hours prior to paving.

The use of Steel/Metal Casting Risers Rings will not be accepted to adjust manholes or water valves to the final elevation (finish grade).

.1 Manhole frames and lids replacement and adjustment will be defined as supplying and installing a new manhole frame and lid and setting to the finished grade. Replacements shall include jackhammering, removal and disposal of the existing frame and lid, replacement, removal or addition of concrete brick (maximum of 3 or minimum of 1) or precast concrete riser rings, cement mortar, supply and installation of new manhole frame and lid set to finish grade, temporary asphalt ramping or patching and all other incidental work.

Unit Price for adjustments to each manhole includes adjusting manholes to the asphalt base lift and then to the asphalt final lift (finish grade) – No additional payment will be made for adjusting manholes to the final lift.

.2 Water Valve Box replacements will be defined as supplying and installing a new Nelson Type Terminal City Water Valve Box frame and lid and setting to the finished grade, temporary asphalt ramping or patching. Replacements shall include jackhammering, removal and disposal of the existing frame and lid and all other incidental work.

.3 Catchbasins frame and grate replacement will be defined as setting as supplying and installing a new catchbasin frame & lid to the correct elevation. Adjustments shall include jackhammering, removal of the existing grating and frame and all other incidental work. Payment includes excavation, disposal, removal of concrete bricks, removal or addition of precast concrete riser rings, cement mortar, disposal of surplus excavated material, cast-in-place concrete, pipes, fittings and related materials together with all labour, materials and equipment required. Catch basin lead work is considered to be incidental to payment for catch basin lead work described in other sections

Adjustment ONLY will be defined as re-using the frames, lids, grates, or valve boxes to complete the Work as described above.

		Delete 1.5.4 and replace with the following	Payment for removal and/or abandon of existing manhole includes excavation, disposal off site of all components, disposal of all unsuitable material, import backfill, plugs, caps, stubs, compaction and all necessary work as shown on Contract Drawing and as specified in the Schedule of Quantities and Prices.
		Add Clause 1.5.7	Payment for overbuild manhole includes removal of a portion of HDPE main and benching around the cut away section and all labour, equipment and materials to complete the work as shown on the Contract Drawings and all applicable works as described in 1.5.1.1.
2.0	**PRODUCTS**		
2.1	**Materials**	Add 2.1.7.3	Any frame and cover assembly creating a point load on the concrete riser rings will not be permitted.

		Delete 2.1.12 and replace with the following	Catchbasin lids manufactured to ASTM C478M
		Delete 2.1.16.2	
		Delete 2.1.17	
3.0	**EXECUTION**		
3.1	**Excavation and Backfill**	Add 3.1.2	For manholes, when base gravels are complete, excavate for grade rings and manhole frame assembly. Do not disturb the compacted road base beyond the excavation requirement.
3.3	**Manhole Installation**	Delete 3.3.12.2 and replace with the following	Allowable products are precast concrete risers and cast-in-place form system. Individual riser heights shall be 50mm, 75mm, or 100mm.
		Delete 3.3.12.5 and replace with the following	Proper layer of grout between the spacers, covering the entire surface of the rings, should be utilized.
		Delete 3.3.15 and replace with the following	Install drop structures as shown on the contract drawings to Coquitlam Standard Detail Drawing COQ-S4 and Standard Detail Drawing S3. Maximum allowable inside ramp shall be 250 mm invert to invert.
		Delete 3.3.17 and replace with the following	Ensure frames conform to design contour of pavement or existing surface. Manhole lids left raised in preparation for overlay paving shall have a rubberized protector ring or asphalt ramp. The use of riser rings for adjusting manhole frames will not be permitted.
3.5	**Catchbasin Installation**	Delete 3.5.1 and replace with the following	Install catch basins as shown on Coquitlam Standard Detail Drawings COQ-S11A, COQ-S11B and Standard Detail Drawing S11, to general standards and installation procedures described under 3.3 of this Section.

END OF SECTION

Appendix A -

Traffic Management Detail Specifications

These supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents (Platinum), Volume II, 2009.

1.0 GENERAL

.1 This Traffic Management detail specification refers to the Contractor's specific plans to identify project traffic risks affecting the *Work*, provide Traffic Control Plans, and to implement the traffic control for the safe passage of vehicles and pedestrian through the work zone.

1.1 Related Works

.1 Traffic Regulation MMCD Section 01 55 00S.

1.2 References

.1 WorkSafe BC, Occupational Health and Safety (OHS) Regulation, Section 18 – Traffic Control.

.2 B.C. Ministry of Transportation (MOT) Traffic Control Manual for Work on Roadways.

1.3 Project Requirements

.1 A Road and Sidewalk Closure Permit is required by Coquitlam for all work affecting traffic flow related to construction. A permit is required for each specific construction interference with traffic flow. A digital copy of the Road and Sidewalk Closure Permit form can be obtained for use during the contract from the City's website at www.coquitlam.ca/closure.

.2 A Road and Sidewalk Closure Permit form application must be submitted to the City's Traffic Operation Division 5 working days prior to start of work.

.3 A detailed Traffic Management Plan (TMP) must be submitted as described in Traffic and Construction Staging Plan (Appendix B). This TMP shall have details, describing access arrangements and work staging.

.4 Contractor will be required to attend a meeting with the City to present their traffic management plan for discussion.

1.4 Measurement and Payment

.1 For this Contract, payment for all work performed under this section, unless included in the Schedule of Quantities and Prices shall be treated as incidental work, including a Traffic Management Plan (TMP), Traffic Control Persons (TMP), traffic markings & all temporary traffic signs, devices as required for traffic & pedestrian safety; and all other items described in the Section 01 55 00S.

2.0 PRODUCTS

2.1 Traffic Management Plan

.1 The Contractor is required to assign a Traffic Manager for the Contract with the responsibility of preparing the Traffic Management Plan and the Traffic Control Plans, as well as the

responsibility for continuing implementation of traffic control for the Work.

.2 The Traffic Management Plan (TMP) will consist of the following components:

1 Category identification through risks and project category assessment as per MOTI Traffic Management Manual for Work on Roadways;

.2 Traffic Control Plans for individual stages of the construction;

.3 Incident Management Plan for the response to an unplanned event and recording of incident information;

.4 Category 3 TMP must be signed and sealed by a qualified Professional Engineer.

.3 Submission of the TMP is to be made to the *Contract Administrator* within five (5) days of the *Notice of Award* of the *Contract*, and must be approved by the *Contract Administrator* prior to start of the *Work*.

.4 Review of the TMP will be performed by the Contract Administrator. Comments for revisions to the TMP will be returned to the *Traffic Manager* for implementations.

.5 The Contractor shall comply with all the requirements of applicable laws, rules, regulations, codes and orders of the municipal and other appropriate authorities concerned with work on streets or highways and shall post proper notices and/or signals, and provide necessary barriers, guards, lights, flagmen or watchmen as may be necessary for proper maintenance of traffic and protection of persons and property from injury or damage. All costs involved in respect to the above requirements will be deemed to be included in the Contract Price.

.6 The Contractor shall give due notice to local police and fire departments prior to beginning construction and shall comply in all respects with their requirements.

.7 The Contractor, during the progress of the work, shall make adequate provision to accommodate the normal traffic along streets and highways immediately adjacent to or crossing the work so as to cause the minimum of inconvenience to the general public.

.8 The Contractor is required to maintain local traffic and driveway access during all stages of construction. This includes maintaining a 1.5m width walkway or pathway through the construction site for pedestrians.

.9 Where existing streets or roads are not available as detours, all traffic shall be permitted to pass through the work with as little inconvenience and delay as possible unless otherwise provided or authorized by the Contract Administrator. If half the street only is under improvement, the other half shall be conditioned and maintained as detour.

2.2 Incident Management and Reporting

.1 The Contractor shall facilitate incident response vehicles and staff and move traffic safely and expeditiously through or around an incident on site and provide assistance to emergency response personnel as required. An incident includes, but is not limited to, motor vehicle accidents, emergency road repairs, disabled vehicles, and debris on the road. The immediate response to an emergency shall by necessity make use of available devices and equipment.

.2 If an incident occurs on site, the Contractor will be required to submit a report to the Contract Administrator documenting details of the incident including event, location, date, time, action taken, duration and restoration of site.

2.3 Traffic Control Plans

.1 The Contractor shall designate a qualified Traffic Control Supervisor for the works, per the requirements of WCB regulations Section 18.

The designated Traffic Control Supervisor may be the same individual that is designated as the Traffic Manager, or may be a separate individual qualified for the responsibilities of this function.

.2 The Contractor shall prepare weekly the anticipated traffic control activities, locations, and durations for the upcoming week.

.3 Permissible delays shall only be considered outside Peak Hours. Permissible delays are categorized as follows:

a) Minor Delays - Less than two (2) minutes in duration; for occasional interruption due to construction activities. These delays shall be coordinated with available breaks in the traffic flow.

b) Major Delays - Maximum five (5) minutes in duration; for occasional interruption of traffic for construction activities if traffic volumes permit. These delays shall be coordinated with available breaks in the traffic flow.

.4 The Contractor is responsible for ensuring that the flow of traffic is unimpeded by construction-related activities.

.5 the Contractor is responsible for maintaining access to all properties on Cedar Drive during all phases of construction, including providing access to garbage collection trucks.

3.0 EXECUTION

3.1 Traffic Control Plan

.1 A copy of the approved current Traffic Plan must be held on site by both the Site Superintendent as well as the person/company responsible for the traffic control implementation.

.2 Failure to produce a valid approved Traffic Plan on site, or having work not follow the Traffic Control Plan will result in immediate shut-down of the work. The Contractor will be required to safely restore facility conditions to allow traffic flow at their expense. The Contractor must take all steps to acquire an approved Traffic Control Plan before work can re-start on site. No claim will be accepted by the Owner for costs associated with this work shut-down.

3.2 Road and Sidewalk Closure Permits

.1 The Contractor must have, on-site, a copy of an approved Road and Sidewalk Closure Permit valid for the work being done. Failure to produce a valid Road and Sidewalk Closure Permit on-site will result in shut-down of the work. Failure to comply on what is stated on the approved permit will result in shut-down of the work. The Contractor will be required to safely restore facility conditions to allow traffic flow at their expense. The Contractor must take all steps to acquire a Road and Sidewalk Closure Permit before work can re-start on site. No claim will be accepted by the Owner for costs associated with this work shut-down.

3.3 Traffic Control Personnel & Equipment

.1 The Contractor shall supply all necessary traffic control devices required to perform traffic control services for the project. Signs and traffic control devices not applying to existing conditions shall be removed. Where operations are carried out in stages, only those traffic control devices that apply to the current stage are to be left in place.

.2 There must be sufficient Traffic Control Persons (TCPs) on site to appropriately and safely direct traffic in all sections of the Work.

3.4 Signage

.1 Supply, installation, maintenance and removal of all works-related signs shall be the responsibility of the Contractor. The location and type of each sign shall be indicated on the approved Traffic Control Plan, for each stage of the works.

Traffic control signs and devices must be positioned and used as specified in the Traffic Control Plan and signs and devices must be located so as to allow traffic to move by or through the work area in a controlled manner and, if necessary, to come to a controlled stop with due regard for the prevailing weather and road conditions.

Signs shall be checked daily for legibility, damage, suitability and location. Signs and delineators shall be cleaned as frequently as necessary to ensure full legibility and reflectance.

Specific road closure signs will be placed at either end of work area informing public that road is only open to local properties only.

3.5 Detours

.1 Any proposed detours must be approved by the Contract Administrator and conducted in accordance with the approved Traffic Plan and the Traffic Control Manual for Work on Roadways.

3.6 Abrupt Changes in Surface Elevations

.1 The Contractor shall minimize any abrupt changes in roadway elevation left exposed to traffic during both working and non-working hours.

A wedge of asphalt must be used as a transition to vertical differences in travelled areas and have a slope of 4:1 or less.

3.7 Cyclist and Pedestrian Access

.1 The Contractor shall make provision for pedestrians, wheel chairs and bicycles to have safe access across the work zone at all times. If this cannot be readily accommodated, then acceptable detours and appropriate signs shall be provided.

3.8 Temporary Pavement Markings

.1 The Contractor shall be responsible for the application and removal of all temporary pavement markings and reflective devices.

All temporary markings must be removed after installation of permanent markings.

4.0 TRAFFIC RESTRICTIONS

4.1 Road and Sidewalk Closure Permits

.1 Minimum of Single Lane Traffic in each direction and all local traffic must be accommodated at all times. Detours and full road closure (with Local Traffic Only) will only be allowed during placement of asphalt paving.

.2 A City of Coquitlam Road and Sidewalk Closure Permit is required for each instance of closure and will be valid for a maximum period of one (1) week and, if still necessary, re-submittal of a Road and Sidewalk Closure Request is required

A copy of the approved Road and Sidewalk Closure and Lane Closure Permit must be held on site by both the Site Superintendent and the person/company responsible for the traffic control implementation.

.3 Total Road Closure will be permitted. However, Contractor shall maintain full access to all properties on the West of Partington Creek as well as Sanitary Pump Station and two adjacent properties. Garbage Collection Trucks will have full access during construction. Properties to be provided access are:
West of Partington Creek/Cedar Drive
4163, 4171, 4215, 4223, 4225, 4233, 4243, 4251, and 4265 Cedar Drive
East of Cedar Drive
Cedar Drive Pump Station, 4182,and 4196 Cedar Drive

.4 Detours will only be permitted as approved by the Contract Administrator and must have a complete Traffic Control Plan indicating detour route, signing, and duration. Detours will not be allowed without sufficient lead time for commercial and retail operation to react appropriately to detour information provided to them.

4.2 Lane Closure Restrictions

.1 **For each of the road sections affected:**

- Road and Sidewalk Closures will be reviewed for appropriateness during the allowable hours of work.
- Access to properties to be maintained
- Sufficient Traffic Control Persons are required for each Road and Sidewalk Closure (or any work activities), including side street intersections, to safely guide traffic through the work site.

5.0 HOURS OF WORK

.1 **The hours of work shall be from 0700h to 1900h inclusive Monday to Friday and 0900h to 1800h inclusive Saturdays, unless noted otherwise.**

.2 Some allowances may be made for paving operations, depending on a proposal acceptable to the Contract Administrator.

.3 Line Marking work may be performed at night, (21:00 to 05:00).

No work is allowed on Sundays without specific written permission from Contract Administrator.

6.0 CONSTRUCTION OPERATIONS

6.1 Truck Routes

.1 The Contractor is restricted to the City's designated Truck Routes. The current Truck Route Map is available on the City's website at www.coquitlam.ca and can be found under Residents, Transit & Transportation, Trucking Routes.

6.2 Road Specific Considerations

.1 Ensure that Traffic Management Plan accommodates businesses and residences during construction activities.

.2 Contractor shall not schedule paving during garbage pickup day.

6.3 Work Stoppage Due to Traffic

.1 The City will not control or direct traffic control activities of the Contractor, but may require an immediate stop to any work where, in the sole opinion of the Contract Administrator, the provided traffic management plan is ineffective or creating unreasonable delays.

6.4 Construction Activity and Signage

.1 The Contractor will be responsible to place other construction information signs as required to inform the public of construction activities, and road closure except for local properties and ensure safe travel through the work site.

6.5 Construction Zone Information Signs

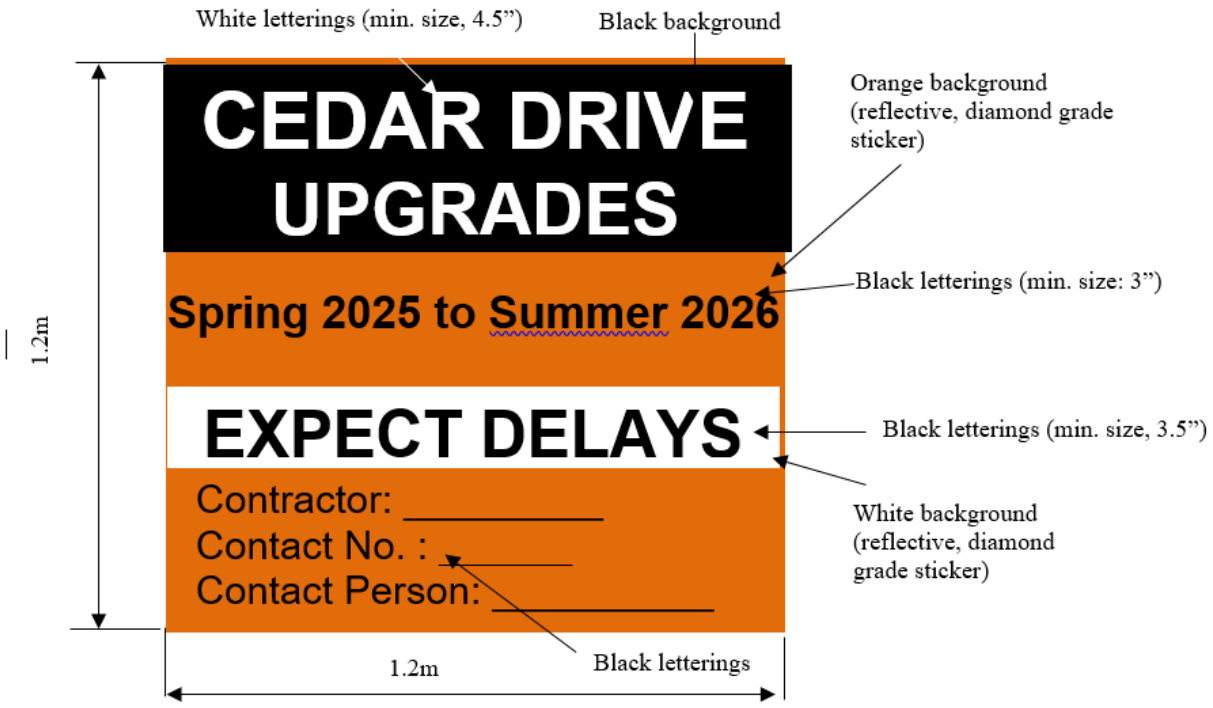
.1 The Contractor is required to provide, one week prior to start of work, six stationary signs at intersections, one in each direction, to inform traffic of existing and anticipated conditions at entry points of the lane to be worked on, locations for these signs will be provided by the Contract Administrator. Signs to be re-used and transferred to the next location once lane is completed.

Ensure that signs and locations are addressed in the Traffic Management Plan. All signs are to be removed at the end of the construction period.

Exact locations to be determined on site by Contract Administrator.

Construction Zone information Signs to follow specifications below:

Construction Zone Information Signs to follow specifications below:



APPENDIX 1

Coquitlam

City of Coquitlam
Road and Sidewalk Closure Permit Request

Traffic and Street Use Management Section
3000 Guildford Way, Coquitlam BC V3B 7N2
Phone: 604-927-6250 Email: StreetPermits@coquitlam.ca

~~**Initial Permit: $150** ☐ **Renewal Permit: $75** ☐~~

Application Date: _____ **City Project or Film Permit Number** (if applicable): **81832 – Phase 2**

- An Initial Permit is required for all new applications and when the location, type of work, or the type of traffic controls change from what was approved for the Initial Permit. The application needs to be received a minimum of 10 business days prior to the intended closure date.
- A Renewal Permit extends the rights and privileges of the approved Initial Permit and is required when the timeline needs to be extended. The application must be received a minimum of 5 business days prior to the intended extension date.

Development Site Address (if applicable): _____

Work location (street name, block number, to/from, at, etc.) _____

Contact Information

Applicant Company Name: _____

Applicant (person completing application form)

Name: _____ **Title:** _____

Phone: _____ **Email:** _____

Applicant's Signature: _____

Company Name (Prime Contractor): _____

Site Superintendent

Name: _____ **Title:** _____

Phone: _____ **Mobile:** _____ **Email:** _____

Permit Information

Start Date: _____ **End Date:** _____

Day(s) and Time(s): ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday From: 00:00 To: 00:00
☐ Saturday From: 00:00 To: 00:00 ☐ Sunday From: 00:00 To: 00:00

Specific Lanes: ☐ Curb ☐ Inside/Centre Lane ☐ Left Turn Lane ☐ Right Turn Lane ☐ Parking Lane
☐ All Lanes ☐ Sidewalk/MUP ☐ Bicycle Lane

Direction: ☐ Northbound ☐ Southbound ☐ Westbound ☐ Eastbound

Purpose of Work: ☐ Concrete Pour ☐ Utility Installation ☐ Curb Installation ☐ Other _____

This permit is related to: ☐ City Design and Construction ☐ City Parks ☐ External Environmental
☐ Development ☐ External/Utilities

City Contact (if applicable): _____

Office Use Only

Permit Conditions/Comments:

_____

_____ _____

Approved by *Date*

Application Checklist

⚠ **The following information must be provided. Incomplete applications will not be reviewed.**

1. ☐ Traffic Management Plan (TMP); **OR**
   ☐ Traffic Management Manual for Work on Roadways Figure Number: _____
2. ☐ **Project Category Determination** (per 2020 Traffic Manual for Work or Roadways).
   ☐ Initial Project Category Assessment
   ☐ Project Risk Analysis
   ☐ Category 1 ☐ Category 2 ☐ Category 3
3. ☐ **Prime Contractor Designation Letter**
4. ☐ **City of Coquitlam Certificate of Insurance**
5. ☐ **Notification Letter and Map** (required for all full road closures). A Notification Letter must be provided to all affected residents and businesses.
   ☐ Yes ☐ No ☐ Not Applicable
6. ☐ **Traffic Control Persons** (flag persons) **required?** All operations within the road right-of-way must comply with WorkSafe BC regulations and BC Ministry of Transportation standards for work on roadways.
   ☐ Yes ☐ No If yes, how many? _____
7. ☐ **Bus routes/stops impacted?** Applicant is to contact Coast Mountain Bus Company (with a minimum of 3 days' notice) Temporary Transit Changes Request Form. General information can be found by visiting Temporary Transit Changes.
8. ☐ **City of Coquitlam Solid Waste has been contacted?** Coquitlam Environmental Services contacted regarding impact to garbage/recycling routes and pick up Phone: 604-927-4300 Email: wastereduction@coquitlam.ca
   ☐ Yes ☐ No
   Are operations impacted? ☐ Yes ☐ No
   If Yes:
   - a plan to ensure continuous collection has been provided: ☐ Yes ☐ No
   - Day(s) of the week impacted: _____
   - Time(s) of the day impacted: ☐ a.m. ☐ p.m.
9. ☐ **Pedestrian / Bike Lanes impacted?** Please describe sidewalks and/or bicycle facilities that will be impacted by the proposed work.

   _____

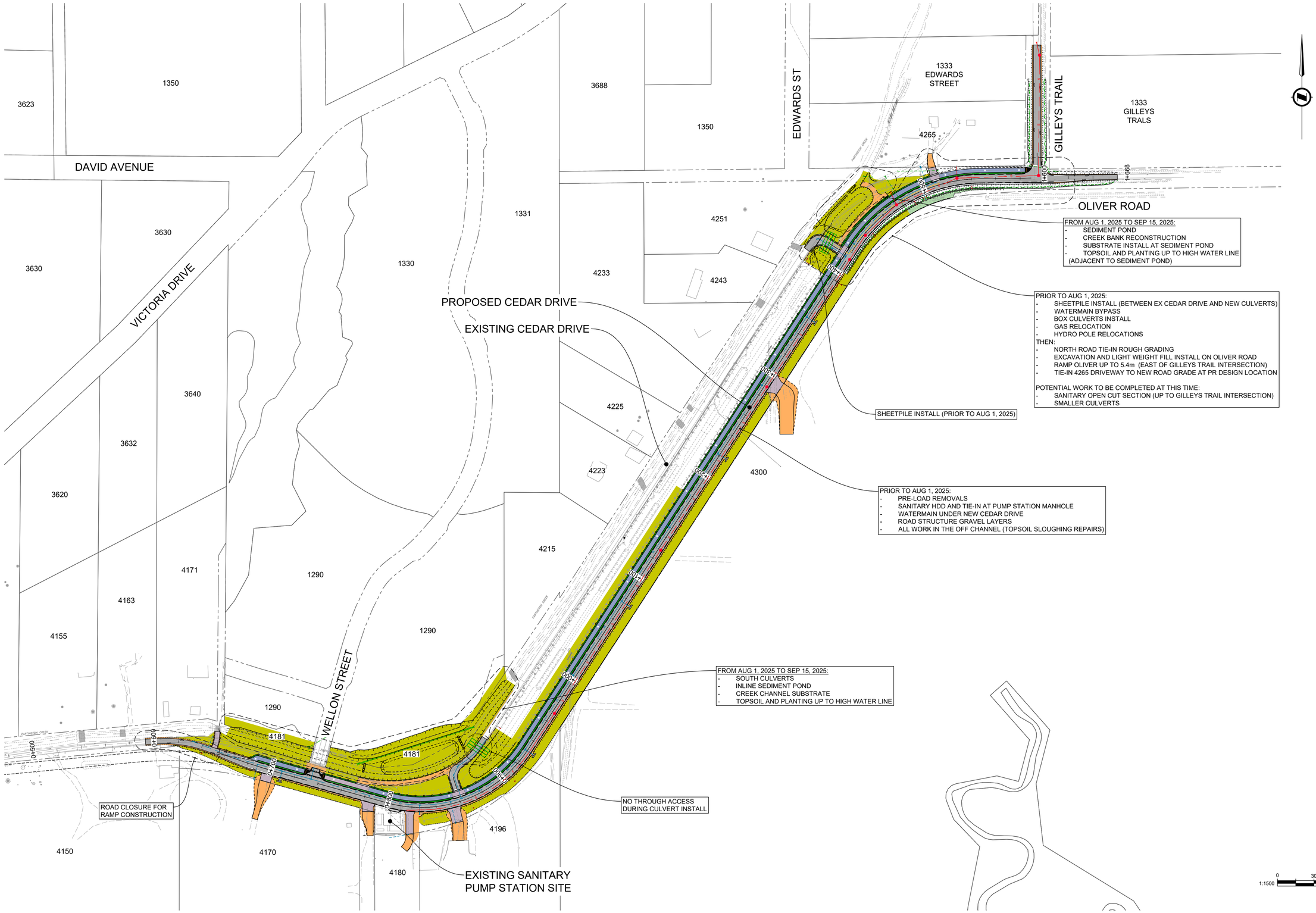
   _____
10. ☐ **Is the work on, or will it impact a road along our Major Road Network?**
    ☐ Yes ☐ No

Additional information

- Only vehicles actively engaged in the performance of cleaning, clearing, maintenance, repair, construction or other work are permitted within work zones. Vehicles being used by Superintendents, Traffic Control Persons, and other construction personnel that are not actively engaged in work described above are not permitted within the work zone and are not permitted parking /stopping prohibitions.
- Closures of sidewalks, cycling facilities, lanes, and full road closures are only permitted during the time periods indicated on the approved permit. Traffic controls are not permitted outside of these approved permit hours.

Appendix B -

Traffic and Construction Staging Plan



PLOT DATE: April 2, 2025

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
A	ISSUED FOR TENDER	2025/03/31	GA	CJB
B	ISSUED FOR TENDER REVISED	2025/04/02	GA	CJB

Coquitlam

TRAFFIC AND CONSTRUCTION STAGING PLAN

CEDAR DRIVE UPGRADES - PHASE 2

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

ISSUED FOR TENDER

DESIGN NO. 32628

SCALE	AS SHOWN	CREATION DATE	OCT - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

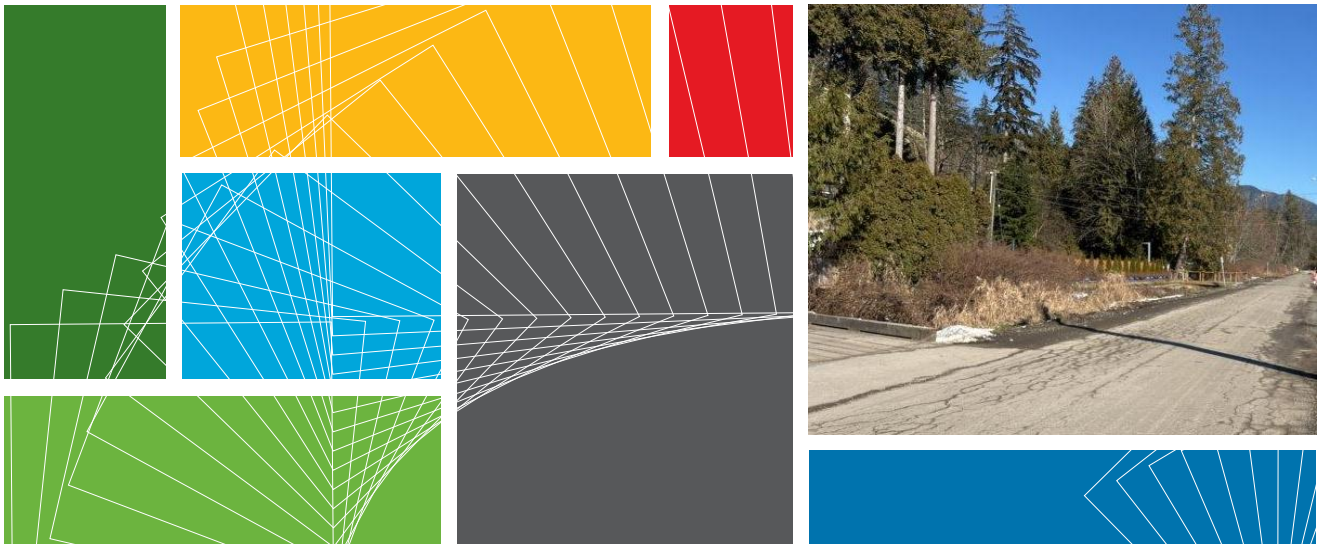
DWG. NO. 01 OF 01

REV. B

File: C:\ADSKACCDocs\ISL\32628_COQ_CedarDrive-Phase1Roadworks\Project Files\02_CADD\20_Drafting\203_Sheets\Phase 1 - Cedar Drive Upgrades\32628_SH_Phase_2_Traffic_Staging.dwg

Appendix C -

Environmental Management Plan (including Environmental Approvals and Authorizations)



City of Coquitlam

Environmental Management Plan for Tender

Cedar Drive Upgrades: Phase 2 Partington Creek Conveyance Improvements Project

April 2025

ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

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SCHEDULES

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Schedule 3 City of Coquitlam's Stream and Drainage System Protection Bylaw No. 4403, 2013

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Figure 1. Key map showing the general location of the proposed Partington Creek Conveyance Improvements Project (Source City of Coquitlam QtheMap, 2024). 2

1.0 INTRODUCTION

The enclosed Environmental Management Plan (EMP) represents environmental commitments associated with the Cedar Drive Upgrades – Phase 2: Partington Creek Conveyance Improvements Project (PCCIP).

The EMP outlines expectations for the Contractor's delivery of environmental impact mitigation, construction impact mitigation, and environmental offset construction by the Contractor. The EMP cites regulatory Change Approvals and Authorizations issued for the project and also cites well-known best management practices (BMPs) for instream and near-stream work.

Key mitigatory measures developed to minimize impacts on the fisheries resource have been incorporated within the engineering and landscape design for environmental protection, mitigation and/or Offsetting. The provisions of the EMP are supplemental to MMCD Environmental Specifications and as such are Contractor 'mandatories'; the EMP forms part of the contract documents for this project.

Prospective Contractors are advised to carefully review this EMP before they submit responses to the tender, to ensure they have adequately captured environmental protection, impact mitigation and offsetting requirements that they are required to fully implement for this project.

2.0 PROJECT BACKGROUND

The Cedar Drive Upgrades – Phase 2: Partington Creek Conveyance Improvements Project (PCCIP) consists of conveyance improvements within and adjacent to Lower Partington Creek, as well as road and infrastructure improvements associated with the relocation of Cedar Drive in Coquitlam, BC (**Figure 1**).

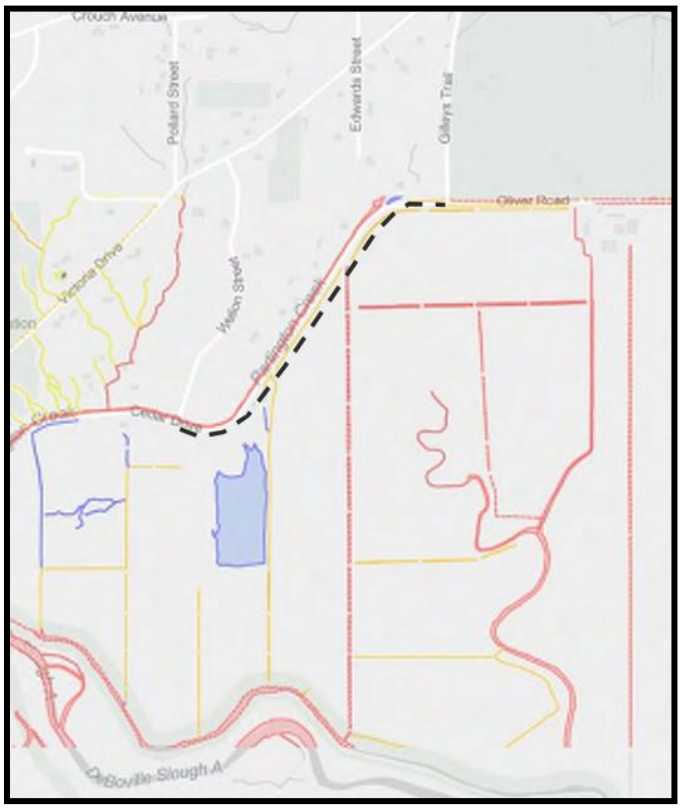


Figure 1. Key map showing the general location of the proposed Partington Creek Conveyance Improvements Project (Source City of Coquitlam QtheMap, 2024).

Phase 2 of the PCCIP requires instream work within Partington Creek and the adjacent off channel that was constructed during Phase 1. Phase 2 of the PCCIP involves the following instream and off-channel construction components:

- Site isolation and bypass
- Excavation of off channel segments
- Installation of stream and drainage culverts
- Installation of streambed and boulder
- Installation of LWD and CWD
- Slope stabilization
- Connection to Partington Creek
- Riparian vegetation planting
- Maintenance and watering

Partington Creek is a fish-bearing stream that drains into the Pitt River via DeBoville Slough. The stream supports salmonids including coho (*Oncorhynchus kisutch*), chum (*Oncorhynchus keta*), rainbow trout (*Oncorhynchus* mykiss), and cutthroat trout (*Oncorhynchus clarkii*). Ditches and channelized streams south of Cedar Drive are known to support fish during certain times of the year and otherwise were considered by the province and Fisheries and Oceans Canada (DFO) to provide fish habitat. The federal *Fisheries Act* and *Migratory Birds Convention Act,* the provincial *Water Sustainability Act*, *Wildlife Act* and *Environmental Management Act* apply to activities associated with this phase.

3.0 PROJECT ENVIRONMENTAL APPROVALS AND PERMITS

The project underwent comprehensive environmental assessment, impact assessment and was subject to federal, provincial and First Nations project review:

- DFO has issued an Authorization for this Project (**Schedule 1**), as the project is considered to result in harmful alteration disruption or destruction (HADD) of fish habitat, requiring offsetting
- The Ministry of Water Land and Resource Stewardship (MWLRS), issued a Change Approval for this project per Section 11 of the Water Sustainability Act (**Schedule 2**).
- The project needs to be constructed in a manner that prevents erosion and sediment deposition that otherwise meets discharge criteria set out in the City of Coquitlam “Stream and Drainage System Protection Bylaw No. 4403, 2013” (**Schedule 3**).
- The Contractor must review the Authorization issued by DFO to understand the environmental protection and mitigation requirements they are required to deploy to meet Authorization conditions: 1, 2.2, 2.3, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 4.3.1, 4.3.2, 4.3.3, 4.3.5, 4.3.6, 4.3.7, 4.3.8.
- The Contractor must review the Change Approval issued by the province to understand the environmental protection and mitigation requirements they are required to deploy to meet conditions: f, i, k, l, m, n, o, p, r u, x,
- Where there are differences in interpretation of the Change Approval, Authorization, and/or MMCD conditions and this EMP, the conditions of the Change Approval, Authorization, and MMCD will supersede those within this EMP.
- The regulatory approvals listed above, and the information within this EMP made on behalf of the project outline the minimum mitigative measures and BMP’s for addressing construction related impacts.

4.0 CONTRACTOR'S INSTREAM WORK WINDOW

- Instream works under this contract will be completed per the timing windows set out in the DFO Authorization and WSA Change Approval, that is between the periods of **August 1st to September 15**.

- The Contractor cannot rely on a fish window extension when planning their instream work schedule and instream work beyond September 15th as this may not be approved by the regulatory agencies.

- Accordingly, the Contractor needs to mobilize early and make use of the time available within the specified window to complete the instream works in Partington Creek and complete tie-ins to the sediment basin and the off-channels.

5.0 ENVIRONMENTAL MONITORING

A qualified, Environmental Monitor (EM) will be provided by Owner for the project. The Contractor is not required to provide their own EM for this project.

- The EM will:
    - Attend a pre-construction kick-of -meeting with the Contractor, Owner, Contract Administrator (CA) and Engineer on Record and complete a Construction Environmental Orientation Record (CEOR) form signed by both the Contractor and EM.
    - Undertake a second field pre-construction meeting held amongst the EM, and Contractor's Site Supervisor (or Foreman) to walk the site and identified site specific risks, schedule, and constraints. Complete a second CEOR.
    - Be provided by the City, the authority to modify or halt any construction activity if deemed necessary for protection of fish and wildlife populations or their habitats.
    - Complete requisite nesting bird surveys and fish salvages.
    - Identify whether the Contractor's mitigatory measures meet the requirements of environmental regulatory Authorizations, Change Approvals, this EMP and applicable environmental Best Management Practices (BMP's).
    - Ensure that applicable best practices for erosion and sediment control (ESC) are deployed consistent with the City of Coquitlam's Stream and Drainage System Protection Bylaw No. 4403, 2013.
    - Report environmental incidents or non-compliance to the CA, Contractor Site Supervisor, and external agencies with jurisdiction.
    - Require that the Contractor have on site all documentation regarding environmental mitigation and environmental approvals (i.e. this EMP must be kept on site with any environmental approvals issued for the project).

- Provide written field inspection memoranda to the Contractor's Site Supervisor and CA. These will indicate whether work is compliant with the regulatory approvals, EMP, and the City of Coquitlam ESC bylaw.
- At the completion of this project, the EM will complete and submit a copy of a post construction report consistent with the recommended standard format to the CA, MWLRS, and City. The report will document that construction has been completed and will document any difficulties encountered during the project.
- Not consider the project to be complete and in compliance with best practices for mitigating the works if there are any outstanding proposed mitigative measures.

6.0 PROJECT MITIGATION MEASURES

6.1 Water Quality Discharge Threshold

Per City's Stream and Drainage System Protection Bylaw Number 4403, 2013, discharge limits for the project are the following:

- Turbidity cannot exceed 25 NTUs under normal weather conditions,
- Turbidity cannot exceed 100 NTUs during and 24 hours after a Significant Rainfall Event (25 mm or greater of rainfall within 24 hours).
- pH values must remain within 6.5 to 8.0 throughout development.

6.2 Notification Requirements Prior to Works

The Contractor must provide the CA with notice prior to the following phase of works. The CA will notify the EM once notice is given by the Contractor for the following specific project activities outlined in **Table 1**.

Table 1. Contractor advance notice requirements.

PHASE OF WORKS	TYPE OF WORKS	ADVANCE NOTICE PRIOR TO WORKS
Instream Works	Fish salvage, site isolation and bypass installation and removal	10 days
Vegetation Removal	Bird nest surveys and wildlife sweeps	5 days

6.3 Fish Salvage/Fish Isolation Fencing

- Fish salvage will be provided by ISL. The Contractor is not required to retain a qualified environmental professional (QEP) to complete fish salvages prior to instream or near-stream works.
- ISL will install fish fencing upstream and downstream of the instream of the site, and then fish will be removed from the work area.
- The fish salvage crew will issue a written report to the CA indicating the fish species and numbers of fish salvaged by their operations and outlining whether the fish salvage is complete.
- The Contractor must not commence instream works until fish salvage is complete.
- The Contractor is responsible for the hand removal of debris which accumulates on the isolation fish fencing.
- The Contractor must not undertake any machine work that will disturb isolation fish fencing.
- Should the Contractor damage isolation fish fencing, they are responsible for costs of replacement and reinstatement of the fencing and cost for any requisite fish re-salvage efforts.
- Should the Contractor lose site isolation or by damaging the fish fence, the Contractor will be responsible for the costs associated with procuring a QEP to repeat the fish salvage.

6.4 Contractor's Bypass Requirements

- All instream works, are to be completed "in the dry"; that is in isolation of flowing water.
- The Contractor shall submit a Water Management and Bypass Plan to be reviewed by the Project Engineer prior to bypass installation. At a minimum, the responsive Water Management and Bypass Plan must include the following:
    - A full stream bypass/sump designed, developed and deployed by the Contractor concurrent with site isolation, and fully maintained throughout the duration of instream works.
    - Have adequate bypass capacity to bypass peak seasonal flow for the duration of instream works.
    - Have adequate bypass capacity to address contingencies such as rainfall and pump malfunction.
    - Bypass directs clean water from upstream of the site, around the worksite, discharging this same water to the stream channel immediately downstream of the isolated site to maintain downstream flows and to prevent dewatering of fish-bearing habitat.
    - Bypass discharge location adequately armored or otherwise protected so that the channel bed is not scoured or disrupted or the banks not eroded.

- Should the Contractor adopt a pump-based bypass system, secondary fish screen mesh minimum opening on the pump intake will be not less than 2.54 mm.
- Fish screen size and method of affixing to the bypass intake must permit adequate water throughput.

- The Contractor is wholly responsible for sizing and developing and maintaining a bypass system in functioning condition throughout the period the watercourse will be bypassed; the isolated site must not be allowed to flood when the Contractor is offsite (i.e. overnight and weekends).
- The Contractor is responsible for maintaining the pump system in working order and cleaning pump intake screens. Should the Contractor elect to use a gravity bypass the Contractor would be responsible for ensuring the gravity system is not occluded by debris.
- Flooding of the works due to inadequate bypass provisions is not acceptable, and daily and weekend shutdowns allowing the worksite to flood is also prohibited.
- Should the Contractor's bypass system fail and this loss of bypass functionality results in an environmental incident (discharge of turbid water, death of fish, alteration of downstream fish habitat) then the Contractor is solely responsible for all costs associated with assessing, cleaning, mitigating, restoring that fish habitat along with costs associated with addressing DFO Director's Order, Orders by a Fisheries Officer, or a provincial Conservation Officer.
- The Contractor would also be responsible for penalties that may be administered under the project contract provisions.
- The Contractor would also be responsible for their loss of profit associated with penalties that may be administered under the project contract provisions. The CA will accept no claims from the Contractor for direct or indirect costs associated with the loss of bypass during the project.
- The CA will accept no claims from the Contractor for direct or indirect costs associated with the loss of bypass during the project. The Contractors failure to plan and install a fully functional bypass system, that results in loss of site isolation, is not the basis for Changed Condition claims.

6.5 Contractor's Site Isolation Requirements

The Contractor is responsible for installing quality, functioning site isolation for all instream works to control water entry and egress from Partington Creek and the constructed off-channel features.

- The site isolation technique utilized must be "substantially leak free" to maintain "in the dry" work conditions.
- "Substantially leak free" will be defined using two parameters:

1. Water passing through, around or under the isolation barrier	< 50 litres/minute
2. Water turbidity discharged from the isolated work site to fish habitat	< 25 Nephelometric Turbidity Units (NTUs)

- If one or both of these parameters cannot be met, then the EM will have the authority to shut down the works and direct the Contractor to make adjustments to site isolation.
- The Contractor shall implement isolation materials in a manner to minimize the release of deleterious substances or turbid flows into the watercourse.
- Should the Contractor lose site isolation and the loss of site isolation result in an environmental incident (discharge of turbid water, death of fish, alteration of downstream fish habitat) then the Contractor is solely responsible for all costs associated with assessing, cleaning, mitigating, restoring that fish habitat along with costs associated with addressing DFO Director's Orders or Orders by a Fisheries Officer or provincial Conservation Officer.
- The Contractor would also be responsible for their loss of profit associated with penalties that may be administered under the project contract provisions. The CA will accept no claims from the Contractor for direct or indirect costs associated with the loss of site isolation during the project.

6.6 Contractor's Trash-Pumping Requirements

- During excavation within the isolated worksite, it is likely that subsurface water or water that leaks through the isolation wall will accumulate within the work zone.
- The water accumulating in the work site is usually very turbid and cannot be discharged to streams or ditches as they may contain fish or may connect to fish habitat.
- This water needs to be removed from the isolated worksite before it accumulates to depth and floods the works.
- A 'trash pump' is usually deployed to draw this sediment-laden water from the isolated work site and lift the sediment-laden water to a location for treatment before it is returned to the ambient environment.

- The Contractor must plan and prepare a viable means of controlling and/or treating sediment-laden trash water. Such details are to be included in their Water Management Plan and Bypass Plan. **Sediment laden water cannot be discharged back into Partington Creek, ditches or channelized streams.**

- Techniques for the effective control of sediment laden water from a trash-pump system may include:

    - Construction of an appropriately sized sediment control basin or dewatering basin (onsite or with approval of adjacent landowners).

    - Getting permission from adjacent landowners to pump sediment-laden water to dry areas well away from Partington Creek.

    - Use of sediment sacks with flocculants.

    - Use of portable sediment treatment systems (i.e. Stormguard, Storm-tech, Filter-tech etc.),

    - Use of other systems the Contractor will warrant as being effective.

- The City's Stream and Drainage System Protection Bylaw Number 4403, 2013 prohibits discharge of sediment laden water exceeding 25 Nephelometric Turbidity Units (NTUs) during normal weather conditions and 100 NTU within 24 hours of a significant rain event (where a significant rain event is ≥ 25 mm rain/24 hours)

- The Contractor will be required to modify their trash-pump sediment control system within 24 hours of being informed by the EM that their system is ineffective in achieving 25 NTU discharge to fish habitat.

- Notwithstanding the 25 NTU discharge requirements set out in the City's bylaw, should turbid water from the trash-pump system exceed 75 NTU at its point of discharge to fish habitat, an Environment Incident will be deemed to have occurred.

- Should such an Environmental Incident occur, the incident will immediately be reported to the CA and Contractor's Site Supervisor and pumping ceased until the situation is mitigated.

- The Contractor would be responsible for their loss of profit associated with deductions that may be administered under the project contract provisions. The Contract Administrator will accept no claims from the Contractor for direct or indirect costs associated with exceedances of turbidity thresholds.

- The Contractor's costs or schedule delays associated with a shutdown of this kind will be the sole responsibility of the Contractor.

- The local shutdown will not be lifted until the trash-pump discharge is brought into compliance with the Contract and this EMP.

6.7 Contractor's Erosion and Sediment Control Requirements

A reference Erosion and Sediment Control Plan has been prepared for the project and is included in the Contract drawings. To meet the City's bylaw discharge requirements the Contractor shall employ the following measures consistent with the ESC Plan:

- Obtain sufficient quantities of polyethylene sheeting and sandbags necessary to cover exposed cut slopes and secure that material from incremental weather such as high wind and heavy rain.
- Leave undisturbed native vegetation wherever possible.
- Stabilize all disturbed slopes, watercourse banks, and ground surfaces that may contribute sediment-laden water into sensitive fish habitats during precipitation events.
- Complete construction in a manner that will prevent the release of sediment or sediment-laden waters to the watercourses, ditches, and swales draining to fish habitat.
- Avoid tracking of sediment onto roadways.
- Sweep the roads daily to prevent sediment and debris off-tracking from site.
- Ensure that ESC control materials and the labour required to install the measures is onsite, available for deployment **prior to** the commencement of rain.
- Repair ESC measures immediately if any damage occurs such that erosion and sediment control is compromised.
- Complete work as quickly as possible once it's started.
- Maintain effective erosion and sediment control measures throughout the construction period until revegetation of disturbed areas is achieved.
- Suspend work during substantial rainfall. The Contractor will establish rainfall shutdown guidelines prior to the commencement of construction.
- Prevent debris from entering ditches or streams that have not been isolated from flowing water.
- Remove any sediment accumulated within the site, including sediment ponds, prior to the completion of the project.

6.8 Wildlife Protection Requirements

All work will adhere to the *Wildlife Act, Species at Risk Act*, and the *Migratory Birds Convention Act* through following this EMP.

- The EM will be notified of any wildlife (i.e. reptiles, bears, coyote, beaver, etc.) that is encountered onsite during construction activities. If wildlife is encountered, works shall be suspended to allow for wildlife to safely pass.

- Black bears are frequently encountered in and around the project site. The Contractor is responsible for ensuring their crews and subcontractors have adequate Bear Awareness training and bear deterrents (bear spray and bear bangers) on-site at all times.

- Feeding dangerous wildlife or leaving attractants is strictly prohibited and punishable by fines under the provincial *Wildlife Act*. The Contractor's crew will not feed or handle wildlife (directly or indirectly).

- If any tree trimming, removal, or vegetation clearing is to take place within the regional nesting bird window (between March 1 to August 15), the EM will perform a nesting bird survey prior to vegetation disturbance activities:
    - The nesting bird survey will be conducted a maximum of 48 hours prior to vegetation disturbance.
    - If an active bird nest is discovered, the EM will apply a 'no disturbance' buffer of appropriate species-specific size.
    - The no disturbance buffer will remain in place until a second survey has confirmed that the nest is no longer active.

- If bird nests which have year-round protection (whether occupied or not) per s. 34 of the Wildlife Act or Schedule 1 of the Migratory Birds Regulations are identified within trees to be removed and cannot be avoided, the EM will notify the CA and provide prescriptions and/or obtain appropriate permits for these nests.

- The Contractor will not conduct tree trimming, removal, or vegetation clearing until the EM has provided a Notice to Proceed.

- Any chance discoveries of bird nests, wildlife denning sites, and other areas of wildlife habitation during construction will be reported to the EM. It is the Contractor's responsibility to ensure their crew are aware of their wildlife reporting responsibilities.

6.9 Contractor's Non-Hazardous Waste Handling Requirements

The Contractor shall adhere to all applicable legislation with respect to the handling, transportation and/or disposal of all materials related to the project. Additionally, the Contractor shall:

- Provide locking waste receptacles that are specifically designed to be wildlife-proof for all waste.

- Provide bins for recycling to reduce waste stream.

- Repair or replace any damage to any receptacles from wildlife due to negligence or improper waste storage. The Contractor will work with the EM to find a solution if wildlife damage is an ongoing problem.
- Store trash cans in a locked container or have removed from site at the end of each day to avoid wildlife attraction. Under no circumstances will bear attractants be left on-site and accessible to wildlife.
- Not dispose of solid wastes onto the site, including sumps, ditches, streams, culverts, road edges or private property.
- Continually monitor for littering as it is prohibited throughout the project.
- Store food and food waste in such a way that it is not easily accessible by animals.
- Recycle or dispose of all solid waste at approved waste disposal facilities.
- Recycle construction materials such as asphalt, cardboard, cement and concrete, clean fill and soil, and green waste. Remaining materials should be transported and disposed of in an appropriate manner unless they can be reused or recycled.
- No burning of any kind onsite.

6.10 Contractor's Requirements to Minimize Dust and Air Pollution

- The Contractor will control dust generation throughout the project on an as-needed basis.
- Dust control will be through the application of water from a truck-mounted unit.
- Water application must not be so heavy such that it floods the road surface and leads to the discharge of sediment-laden water to ditches and streams that provide fish habitat.
- The Contractor will avoid excessive vehicle idling.
- Personal vehicles; light diesel truck must not be left unoccupied and idling for more than 1 minute.
- Heavy machinery must not be left unoccupied and idling for more than 5 minutes.

6.11 Contractor's Hydrocarbon Wastes and Fuel Spill Mitigation Measures

- The Contractor will prepare a Spill Response Plan (SRP)for review by the CA/Owner's Environmental at least 14 days prior to construction.
- The SRP must include a Project Contact List similar to that shown in **Schedule 4** and include an Incident Response and flow chart similar to that shown in **Schedule 5**.
- The SRP must include the following provisions:
    - Store fuel and hydrocarbon-based lubricants in designated storage areas >30 m from streams and ditches.
    - Prevent the discharge of hydrocarbons (oils, fuel, grease, lubricants, anti-freeze), concrete, grouts, construction wastes, or other deleterious substances to fish habitat or to the ground.
    - Prevent oil, grease, or any other substances deleterious to aquatic life from entering any watercourse, ditch, or storm sewer.
    - Avoid damaging buried infrastructure (**CALL BEFORE YOU DIG**).
    - Avoid refueling within 30 m of a stream or ditch.
    - Ensuring refueling attendants always maintain a hand on the refueling hose (i.e. ensuring attendants do not lock the hose and attend to other matters while refueling operations are underway).
    - Inspect equipment and machines that are utilized onsite will be delivered to the site in clean, good operating condition.
    - Provide dedicated waste receptacles for hydrocarbons and lubricant fouled waste material, concrete, and other potentially deleterious wastes.
    - Provide secondary containment for fuel and chemical containers with 125% capacity of the primary storage container.
    - Deploy drip trays beneath machinery to catch drips and leaks.
    - Deploy spill containment, control and clean-up materials in the event of a spill.
    - The Contractor should act quickly and effectively if a spill occurs and notify the CA and Contractor's Site Supervisor immediately.
    - Report per the Environmental Management Act - Spill Reporting Regulation (**Schedule 6**).
    - Restock spill kits within 48 hours of a spill.
- The SRP must be posted on the board or near the refueling facility.

- The Contractor is wholly responsible for costs associated with clean-up of spills originating from their equipment or work practices and with any regulatory penalties, orders or charges stemming from a spill originating from their equipment or work processes.

6.12 Contaminated Soil Management Requirements and Responsibilities

Soil was not sampled and tested for potential concern. Given the previous land use for agriculture, there were no identified concerns or risks regarding the potential encounter of contaminated soils. None-the-less, during Phase 2 construction the contractor may encounter soil contaminated by historic anthropogenic activities and/or soil contaminated by naturally elevated metals, salts and organics.

- Some contaminant constituents are associated with visual or olfactory cues which can help identify risk.
- During excavation, the EM and Contractor will independently assess the removed fill material for visual or olfactory indicators of contamination, including:
    - Dark, wet, or oily soil that is accompanied by an unnatural odor,
    - Soil with an unnatural color, texture, or smell that is indicative of the presence of contaminants.
- Debris or buried containers that may have contained chemicals or hazardous materials (i.e. steel drums, automotive parts, tanks, or barrels).
- If suspect soil with olfactory or visual cues of contamination are encountered, excavation should cease at that location until the EM is able to categorize the material with respect to whether it is waste material, material suitable for reuse onsite or material suitable for transport and reuse on another parcel with appropriate land use designation.
- The Contractor would not be responsible for costs associated with categorization of this material. The Contractor would not be responsible for costs associated with disposal of Industrial Use Standard (IL+) soil. This material would be covered under Contract provisions for Concealed or Unknown Conditions.

However, not all contaminants can be identified by visual or olfactory means. Excavation and deactivation of existing buried utilities is likely to create the potential for generating excess spoil that has no overt evidence of contamination (i.e. no obvious olfactory or visual cues). The Contractor is responsible for identifying offsite recipient location(s) that will accept soils up to the (IL), for soils which may have to be transported offsite. The Contractor may also identify recipient sites that will accept donor soils that that fall within the Agricultural Use Standard (AL).

- If excess material is to be hauled offsite for disposal at a recipient site, then the Contractor is responsible for retaining a Qualified Professional (Engineer, Geoscientist, Rostered Professional) who specializes in contaminated soil categorization, management and transportation of contaminated soil, that cannot be identified as ‘suspect’ by visual or olfactory cues.
- The categorization of soil, handling, transport, reporting and disposal required by the Contractor’s recipient sites must be in accordance with the BC Environmental Management Act (EMA) and its Regulations (Contaminated Sites Regulation; Hazardous Waste Regulation), as well as the Workers Compensation Act.

- Suspect material identified by the Contractor's QP, may be categorized in situ or ex situ. For ex-situ testing, soil would need to be stockpiled on polyethylene sheeting (6 mil or greater) at least 15 m from ditches, drainages and catch basins.

- Each stockpile needs to be fully covered to prevent the transport of pollutants from the stockpile to the environment. The plastic sheeting needs to be weighted to prevent the cover from being blown off during windy weather.

- Irrespective of whether the Contractor's QP uses in-situ, ex-situ categorization methods, the Contractor's QEP will be responsible for undertaking their work in compliance with legislative requirements, established Guidance Documents and established Protocols to develop a statistically defendable categorization program.

- The Contractor's QP will need to maintain records of contaminants, soil, volumes, classification, disposal records, chain of custody, and any Notices or Instruments with which they have responsibility.

- Japanese knotweed is present on the site and will require removal. The Contractor shall identify a disposal site that will accept soil that has had knotweeds growing in and around it.

6.13 Contractor's Hazardous Material Management

The following measures need to be implemented by the Contractor prior to and / or during the works.

- All materials must be stored, contained, and labeled in strict compliance with the project's applicable provincial and federal permits, as well as all relevant regulations.

- In the event of a hydrocarbon spill the absorbent materials or soils saturated with oil (> 3% by mass) or gasoline are classified as Hazardous Waste. The Contractor's SRP must document the procedure for categorizing and disposing of Hazardous Waste generated by their activities at the site.

- If any hazardous materials are generated at the site, the material must be labeled in accordance with the Transportation of Dangerous Goods Regulations.

- The BC Hazardous Waste Regulations and the federal Transportation of Dangerous Goods Regulation must be adhered to with respect to storage, transportation, and disposal of hazardous wastes.

- Should the Contractor generate hazardous waste through any activity, process or malfunction associated with project construction, the Contractor is responsible for identifying licensed facilities who will accept that waste and transporting that waste to the licensed facility. Costs associated with managing and transporting of hazardous wastes generated by the Contractor's activities are the sole responsibility of the Contractor.

SCHEDULE 1
DFO Authorization

PATH No.: 21-HPAC-01506

Fisheries and Oceans Canada | Pêches et Océans Canada

Paragraphs 34.4(2)(b) and 35(2)(b) *Fisheries Act* Authorization

Authorization issued to
City of Coquitlam *(hereafter referred to as the "Proponent")*

Attention to: Nadeem Kazmi

3000 Guildford Way
Coquitlam, BC V3B 7N2

Location of Proposed Project

Nearest community:	Coquitlam
Municipality:	City of Coquitlam
Province:	British Columbia
Name of watercourse:	Partington Creek
UTM Coordinates:	Between 10U 519940 m E 5459588 m N and 10U 520547 m E 5460066 m N

Valid Authorization Period

This Authorization remains in force from the **Date of Issuance** until **December 31, 2036.**

Please note that this Authorization may contain more specific timing requirements and limitations. These are set out in the Conditions of Authorization section.

Description of Proposed Project

The proposed project of which the work, undertaking or activity authorized is a part of involves:

- The installation of new sanitary and water main infrastructure, which includes in-line and off-line sediment ponds; infilling of agricultural ditches; and riparian vegetation removal; associated with the realignment and raising of Cedar Drive in Coquitlam, BC.

The project is described in the following documents, hereafter referred to as the "Project Plan":

- Partington Creek Conveyance and Off-channel Habitat Project – *Fisheries Act Authorization Application Form* dated December 17, 2021, prepared by ISL Engineering and Land Services. (ISL); and
- *Rev.02 Supplementary Report* dated August 17, 2023, prepared by ISL.

Description of Authorized works, undertakings or activities likely to result in the harmful alteration, disruption, or destruction (HADD) of fish habitat:

The works, undertakings, or activities associated with the proposed project described above, that are likely to result in the harmful alteration, disruption, or destruction of fish habitat, are:

- Construction of an in-line sediment pond within Partington Creek (the Creek);
- Construction of an off-line sediment pond adjacent to the Creek; and
- Infilling of three (3) agricultural ditches located directly south of the Creek.

The authorized works, undertakings, or activities are likely to result in the following impacts to fish and fish habitat:

Partington Creek:

- Harmful alteration, disruption or destruction (HADD) of not more than 915 m^2 of aquatic habitat below the high-water mark, comprised of an in-line sediment pond within the Creek (315 m^2) and an off-line sediment pond adjacent to the Creek (600 m^2); and
- HADD of not more than 7,700 m^2 of riparian habitat above the high-water mark.

Agricultural Ditches:

- HADD of not more than 2,066 m^2 of aquatic habitat below the high-water mark, comprised of infilling two (2) non-fish bearing ditches (1,250 m^2) and one (1) seasonally fish-bearing ditch (810 m^2); and
- HADD of not more than 2,060 m^2 of riparian habitat above the high-water mark.

The works, undertakings, or activities associated with the proposed project described above, are not expected to result in death of fish provided that avoidance and mitigation measures described in the Project Plan and outlined in the Conditions of Authorization below are effectively implemented. Any death of fish resulting from this project should be demonstrated to have been unavoidable or accidental. DFO should be notified immediately in such circumstances via an email to DFO.PACViolations-InfractionsPAC.MPO@dfompo.gc.ca **and** to Observe, Record, Report at 1-800-465-4336 or DFO.ORR-ONS.MPO@dfo-mpo.gc.ca.

Conditions of Authorization

The above-described works, undertakings or activities must be carried on in accordance with the following conditions.

1. **Conditions that relate to the period during which the works, undertakings or activities can be carried on:**

   The works, undertakings or activities are authorized to be carried on during the following period:

   FROM: Date of Issuance TO: December 15, 2025

   If the Proponent cannot complete the works, undertakings or activities during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above period. An application for amendment, suspension or cancellation of the Authorization should be submitted to DFO.

The periods during which other conditions of this Authorization must be complied with are provided in their respective sections below.

2. Conditions that relate to measures and standards to avoid and mitigate impacts to fish and fish habitat:

2.1 Qualified Environmental Professional: The Proponent shall retain an appropriately Qualified Environmental Professional (QEP) to implement measures and standards to avoid and mitigate impacts to fish and fish habitat. The QEP shall monitor the implementation of the conditions of this authorization and shall be onsite at all times during all works, undertakings or activities below the high-water mark of fish bearing watercourses. The QEP shall ensure the measures and standards to avoid and mitigate impacts to fish and fish habitat are effective, and that no additional harm to fish and fish habitat occurs other than what is authorized herein.

2.2 The Proponent shall adhere to all designs and avoidance and mitigation measures outlined in the Project Plan for the protection of fish and fish habitat. In the event of a conflict between those measures and the conditions of this Authorization, the conditions of this Authorization shall prevail.

2.3 Works, undertakings or activities below the high-water mark of fish bearing watercourses shall be conducted during the least risk to fish work window. The least risk to fish work window is between **August 1 to September 15 of any given year.**

2.4 The QEP shall conduct a fish salvage(s) in fish bearing watercourses in advance of all works, undertakings or activities below the high water mark. Use low impact salvage methods such as minnow trapping and seining before using higher impact electrofishing. In the event that isolation is breached, stop work and repeat fish salvage efforts.

2.5 Sediment and erosion control: Sediment and erosion control measures must be in place and shall be monitored and maintained, such that the release of sediment is minimized or avoided at the location of the authorized works, undertakings, or activities.

2.6 The QEP shall carry out routine quantitative water quality monitoring (e.g., turbidity, total suspended solids) to detect increased suspended sediment within and in areas adjacent to the project footprint, during in-water works, or at any time that sediment is observed entering or being re-suspended from the project site and/or project activities and provide direction on appropriate corrective actions as needed (e.g., suspend works, maintain erosion and sediment control measures, etc.).

2.7 All equipment and machinery working on site shall be in good working order, maintained free of fluid leaks, invasive species, and noxious weeds.

2.8 Biodegradable hydraulic fluids shall be used in all equipment working in or near water.

2.9 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

2.10 Land-based equipment is to work in the dry (i.e., from above the high-water mark, or the dry portion of the watercourse), whenever practicable.

2.11 Weather forecasts shall be monitored, and avoidance and mitigation measures adhered to and upgraded as needed (e.g., in advance of forecasted large precipitation events).

2.12 Measures related to the placement of materials below the high-water mark of watercourses where there is potential for fish presence or downstream fish presence:

2.12.1 Conduct works in the dry or in isolation of flowing water.

2.12.2 A QEP shall be on-site prior to start-up and for the duration of all material placement.

2.12.3 Material placed shall be inert and free of silt, overburden, debris, or other substances deleterious to aquatic life.

2.12.4 Upon completion of the works, unimpeded fish passage is to be maintained for all species and life stages naturally present in the system at the times they are expected to use the habitat.

2.12.5 Material stockpile locations must be placed at an appropriate distance from any watercourse and be monitored to prevent the release of sediment into adjacent fish and fish habitat.

2.13 Contingency measures: Additional measures shall be put in place if the monitoring required in Section 3 below indicates that the measures and standards to avoid and mitigate impacts to fish and fish habitat are not successful.

2.14 Dates by which these measures and standards shall be implemented: The measures and standards to avoid and mitigate impacts to fish and fish habitat in Section 2 of this Authorization shall be implemented prior to the initiation of works, undertakings or activities.

3. **Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate impacts to fish and fish habitat:**

3.1 Monitoring of avoidance and mitigation measures: The Proponent shall retain a QEP to monitor the implementation of avoidance and mitigation measures referred to in Section 2 of this Authorization and report to DFO **within 90 days of completion** of all authorized works, undertakings or activities, and indicate whether the measures and standards to avoid and mitigate impacts to fish and fish habitat were conducted in accordance with the conditions of this Authorization. This shall be done by:

3.1.1 Demonstration of implementation and effectiveness of mitigation measures: This shall include, at a minimum, the following:

3.1.1.1 A description of the completed authorized works, undertakings or activities, including dimensions (e.g., area, elevation, slope, etc.) and materials used;

3.1.1.2 A comparison of the completed authorized works, undertakings, or activities with the design dimensions or engineering design drawings provided in the documents listed in the Project Plan;

3.1.1.3 A summary of the fish salvaged. The information summarized shall include dates, number and species of individuals salvaged, holding and handling time, water temperature (watercourse and any fish holding containers), the location of salvage and relocation, and the nature of any effects on salvaged fish (death, sub-lethal harm, etc.); and

3.1.1.4 Providing dated photographs and inspection reports to demonstrate implementation and results of effectiveness monitoring of mitigation measures and standards

described above, to limit the impacts to fish and fish habitat to what is authorized herein.

3.1.1.5 Contingency measures: Providing details of any contingency measures that were followed to prevent impacts greater than those covered by this Authorization in the event that mitigation measures were not effective.

3.1.1.6 As-builts: The Proponent shall provide DFO with georeferenced 'as-built' drawings and geospatial polygons that accurately represents the completed HADD footprint(s). Geospatial polygon data should be collected using WGS 1984 to four (4) decimal places (e.g., 28.5234°N, 80.6830°W). Geospatial polygon data must be supplied in Shape File (.shp, .shx, .dbf) format and .xml or .kmz format. In addition, the following data must also be supplied in an Excel file (i.e., metadata):

- HADD area per habitat type;
- Date when the HADD is completed;
- Brand name and model of the GPS unit used, the coordinate system used, and guaranteed accuracy of the GPS unit.

3.1.1.7 Report Submission: All required reports, geospatial polygons (Shape files), and Excel files are to be submitted to ReferralsPacific@dfo-mpo.gc.ca with reference to DFO File Number: 21-HPAC-01506.

4 Conditions that relate to offsetting

4.1 Letter of Credit: As the beneficiary of the Letter of Credit (Bank of Nova Scotia Letter of Credit Number: OSB83321VAN) provided to DFO as part of the application for this Authorization, DFO may draw upon funds available to cover the costs of implementing and maintaining the offsetting measures required to be implemented under this Authorization. This also includes the use of funds to complete monitoring measures included in Section 5 of this Authorization, in instances where the Proponent fails to implement these required measures.

4.2 Scale and description of the offsetting measures: The offsetting measures shall be on-site construction of not less than 1,535 m^2 of aquatic habitat within the Creek; creation of not less than 3,970 m^2 of off-channel aquatic habitat connected to the Creek; and 17,310 m^2 of riparian habitat along the Creek. The offsetting measures shall be carried out in accordance with the measures set out in the Proponent's offsetting plan, described in the Project Plan.

4.3 Offsetting criteria to assess the implementation and effectiveness of the offsetting measures: Construction of the offsetting measures (i.e., creation of aquatic habitat and riparian planting) shall be completed by **December 15, 2025**. The Proponent shall retain a QEP to conduct monitoring of the fish habitat offsetting measures for a period of ten (10) years post-completion of the offsetting described herein. The final monitoring report is due by **December 31, 2035**, at the end of the ten (10) year monitoring period (e.g., if offsetting is delayed or additional monitoring is deemed required to meet the conditions of this Authorization).

The Proponent will be considered to have met the requirements of this Authorization as it pertains to fish habitat offsetting measures according to the criteria described in the Proponent's offsetting plan and the specific criteria listed below:

Instream Habitat:

4.3.1 The large woody debris cluster(s) and boulder placement(s) are structurally stable with no indication of destabilization, movement, deterioration, slumping, or pockets of erosion;

4.3.2 The Creek substrate, pool habitat(s), and riffle habitat(s) are stable, with no wash-out, erosion or sedimentation issues;

4.3.3 The Creek remains consistent with the areas (footprints) and elevations as described in the as-built drawings;

4.3.4 Fish passage is maintained through the off channel during all flow conditions; and

4.3.5 Water quality (temperature, dissolved oxygen, and instream flow/discharge), as well as depth measurements (bankfull depth and wetted depth) align with those anticipated by design.

Riparian Habitat:

4.3.6 The riparian planting area is stable, with no erosion or sedimentation issues;

4.3.7 Invasive species are actively managed throughout the monitoring period, to a percent surface cover of no more than 5% in the riparian offsetting area; and

4.3.8 Survivorship of planted vegetation (overstory and understory) is at least 80%, by the end of the monitoring period. Plants must be healthy, and the dimensions of the riparian area shall be consistent with those of the as-built drawings. Maintenance shall be undertaken as required throughout the monitoring period, including irrigation and additional replacement planting with native species to address mortality.

4.4 Contingency measures: If the results of monitoring as required in Section 5 of this Authorization indicate that the offsetting measures will not be completed and/or will not meet the criteria in Condition 4.2 and 4.3 by **December 15, 2025**, the Proponent shall provide a written description of all deficiencies to DFO by **December 31, 2025**. The Proponent shall further retain a QEP to implement contingency offsetting measures and a monitoring plan, which is to be submitted to DFO by **January 31, 2026** for review and approval. The Proponent shall implement the contingency measures and associated monitoring measures for the deficient offsetting, and as set out in Section 5 of this Authorization, to ensure the implementation of the offsetting measures is completed and/or functioning as required by this Authorization.

4.4.1 Scale and description of contingency measures: The contingency offsetting measures shall be approved by DFO, in an amendment to this Authorization, prior to implementation. Final determination of the suitability and sufficiency of the contingency measures to offset for the harmful alteration, disruption or destruction of fish habitat, account for time lag, and/or to meet the offsetting criteria as outlined in Condition 4.2 and 4.3 of this Authorization, is at the discretion of DFO.

4.4.2 Monitoring measures to ensure contingency offsetting is completed and/or functioning as required: Contingency offsetting measures shall be monitored per the requirements described in the DFO approved contingency offsetting measures.

4.5 The Proponent shall not carry on any work, undertaking or activity that will adversely impact the offsetting measures.

5 **Conditions that relate to monitoring and reporting of implementation of offsetting measures (described in Section 4):**

5.1 Schedule(s) and criteria: The Proponent shall retain a QEP to monitor the implementation and effectiveness of offsetting measures according to the timeline and criteria below:

5.1.1 Per Table 13 of the Project Plan, monitoring shall be conducted at a minimum of once annually for ten (10) years post construction, at a time that allows for the criteria described in Condition 4.3 of this Authorization to be assessed.

5.2 Reporting of offsetting measures: The QEP shall report to DFO on whether the offsetting measures were implemented and functioning according to the conditions of this Authorization by providing the following information to DFO:

5.2.1 Offsetting Construction: **Within 90 days** of the completion of offsetting construction, provide a written assessment to DFO on whether the offsetting measures were constructed in accordance with the conditions of this Authorization. The report(s) shall include, at a minimum, the following:

5.2.1.1 Geo-referenced 'as-built' drawing(s) of the completed offsetting measures, which shall include the elevation of offsetting components as well as bathymetry and areal footprints;

5.2.1.2 A description of the completed offsetting measures, including dimensions (e.g., area, elevation, slope, etc.), material(s) used, and the species, quantity, and density of planted vegetation;

5.2.1.3 A comparison of the completed offsetting measures with the proposed offsetting measures described in Condition 4.2 of this Authorization;

5.2.1.4 An assessment of the stability (e.g., signs of potential erosion, failure, movement, or other physical alteration that may affect stability) of the offsetting measures;

5.2.1.5 Geo-referenced and dated photographs of the offsetting areas pre-, during, and post-offset construction;

5.2.1.6 Establishment of fixed photo points that will be used to document changes of the offsetting measures over time;

5.2.1.7 Details of riparian offsetting planting species assemblage, density, and total planted areas (reported in m^2);

5.2.1.8 A summary of the effectiveness of mitigation measures and standards implemented during construction of the offsetting measures; and

5.2.1.9 Recommendations as to whether additional offsetting measures are required to meet the requirements of the offsetting measures.

5.2.2 Offsetting Effectiveness: The QEP shall report to DFO on the effectiveness of the offsetting measures according to the conditions of this Authorization. Habitat Offsetting Effectiveness Monitoring Reports are required for each year of monitoring following completion of all offsetting measures per the monitoring schedule in Condition 5.1 of this Authorization. The Year 1 monitoring period shall be determined upon completion of the offsetting measures.

The reports are to be submitted to DFO by **December 31** of each monitoring year, and shall include, at a minimum, the following:

5.2.2.1 Updates to the geo-referenced 'as-built' drawing(s) delineating the area of the offsetting measures, including bathymetry and areal footprints, if there have been any changes to the offsetting habitats;

5.2.2.2 A description of the methods used to assess the habitat offsetting measures;

5.2.2.3 An assessment of the success (e.g., growth, density, survivorship, and functionality) of the offsetting measures (to date) in accordance with the criteria listed in Condition 4.2, 4.3 and the monitoring schedule listed in Condition 5.1 of this Authorization.

5.2.2.4 An assessment of the stability of the offsetting measures, identifying any signs of potential erosion, accretion, failure, movement, or other physical alteration that may affect stability;

5.2.2.5 Geo-referenced and dated photographs or video documenting the offsetting measures for the respective monitoring period (including at fixed photo points to document changes over time);

5.2.2.6 Identification of any effectiveness concerns related to the offsetting measures and a description of any remedial measures taken; and

5.2.2.7 The final Offsetting Effectiveness Monitoring Report (Year 10) shall include an evaluation of whether the offsetting measures undertaken counterbalance the authorized impacts to fish and fish habitat, as indicated by the achievement of all the measures described in Condition 4.2 and 4.3.

5.3 Other monitoring and reporting conditions for offsetting:

5.3.1 Provide georeferenced 'as-built' drawings and geospatial polygons that accurately represents the completed offsetting footprints. Geospatial polygon data should be collected using WGS 1984 to four (4) decimal places (e.g., 28.5234°N, 80.6830°W). Geospatial polygon data must be supplied in a Shape File (.shp, .shx, .dbf) format and .xml or .kmz format.

In addition to the geospatial polygons, the following metadata must also be supplied in an Excel (.xlsx) file format:

- Area (in m^2) of offset per habitat type, based on depth during high and low water seasons (i.e. riparian, off-channel habitat);
- Date offsetting was completed, date and nature of any maintenance works completed, and date monitored; and
- Brand name and model of the GPS unit, the coordinate system used, and guaranteed accuracy of the GPS unit.

5.4 Report submission: All required reports, geospatial polygons (Shape files), and Excel files are to be submitted to ReferralsPacific@dfo-mpo.gc.ca, with reference to DFO File Number: 21-HPAC-01506.

6 Conditions that relate to reporting and engagement with Indigenous Groups:

6.1 In recognition of the importance of the health of the aquatic environment in the local area and associated fisheries resources to Indigenous Groups for cultural and subsistence reasons, documents, monitoring reports, plans and notifications submitted to DFO under Conditions 3, 4 and 5 of this Authorization must be shared concurrently by the Proponent with DFO and potentially affected Indigenous Groups who have requested them.

6.2 The Proponent shall adhere to the commitments made with Kwikwetlem First Nation regarding collaboration and involvement related to this Authorization. This may include, but is not limited to, working with the Kwikwetlem Guardian Program.

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this Authorization and for all design, safety, and workmanship aspects of all the works associated with this Authorization.

The holder of this Authorization is hereby authorized under the authority of Paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*. R.S.C., 1985, c.F-14, to carry on the work(s), undertaking(s) and/or activity(ies) that are likely to result in impacts to fish and fish habitat as described herein.
This Authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This Authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

This Authorization does not permit the killing, harming, harassment, capture or taking of individuals of any aquatic species listed under the *Species at Risk Act* (SARA) (s. 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).

At the date of issuance of this Authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized work(s), undertaking(s) or activity(ies).

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the unauthorized death of fish by means other than fishing and/or the harmful alteration, disruption, or destruction of fish habitat. Such notifications should be directed to DFO.PACViolations-InfractionsPAC.MPO@dfo-mpo.gc.ca **and** to Observe, Record, Report at 1-800-465-4336 or DFO.ORR-ONS.MPO@dfo-mpo.gc.ca.

The failure to comply with any condition of this Authorization constitutes an offence under Paragraph(s) 40(3)(a) of the *Fisheries Act* and may result in charges being laid under said Act.

A copy of this Authorization should be kept on site while the work is in progress and upon request be provided to relevant federal or provincial officials. The Authorization holder is responsible for ensuring work crews are familiar with, and able to adhere to, the conditions.

This Authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this Authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this Authorization shall advise DFO in advance.

Date of Issuance: December 21, 2023

Approved by: Chambers, Susan Digitally signed by Chambers, Susan Date: 2023.12.21 15:14:32 -08'00'

Susan Chambers
Regional Director General
Pacific Region
Fisheries and Oceans Canada

SCHEDULE 2
MWLRS Change Approval

BRITISH COLUMBIA

November 2, 2023 Approval Number: 2008929

City of Coquitlam
3000 Guildford Way
Coquitlam, BC V3B 7N2

Sent via email: mzaborniak@coquitlam.ca

Dear City of Coquitlam,

Re: Change Approval - Changes In and About a Stream on Partington Creek at Cedar Drive

A Change Approval for the above application has been granted and a *Water Sustainability Act* Section 11(1) Changes In and About a Stream Approval document verifying this is attached.

This Change Approval does not authorize entry onto private or Crown owned land. Permission of the affected landowner must be obtained and should be in writing for your protection.

You are reminded of your commitment to have Kwikwetlem First Nation involved in archaeological investigations for this project and use of the Kwikwetlem Guardians program during project works.

This Approval does not constitute authority of any other agency. The holder of this Approval shall have the necessary permits from other agencies concerned prior to the commencement of the works authorized herein. The permit holder is required to adhere to all other applicable Provincial and Federal Regulations.

A copy of this Approval (and associated plans/drawings listed on this Approval) must be available for inspection, upon request, at any location where the authorized changes in and about a stream are being undertaken.

This Approval requires the oversight of an appropriately Qualified Professional. For the purposes of this authorization, that professional must be registered with one of the five professional regulatory bodies named under the *Professional Governance Act* of British Columbia. They must be in good standing and acting under that professional regulatory

Ministry of Forests
Mailing Address: 200-10428 153 Street, Surrey BC V3R 1E1
Location: 200-10428 153 Street, Surrey BC V3R 1E1
Phone: (604) 586-4400
Fax: (604) 586-4434
Web: http://www.frontcounterbc.gov.bc.ca/

body's code of ethics and subject to disciplinary action by that professional regulatory body.

The holder of this Approval shall ensure that any proposed development and/or changes do not impact traditional or special sites in accordance with the *Heritage Conservation Act* or the ability of First Nation community members to participate in traditional activities on the land and water.

Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a permit from the Archaeology Branch. The holder of this Approval must advise everyone who will be involved in ground-disturbance and construction that if archaeological materials are encountered, activities must be halted, and the Archaeology Branch contacted at 250-953-3334 for direction.

Section 105 of the *Water Sustainability Act* gives the recipient of this notice the right to appeal my decision. You may file an appeal within 30 days of the date indicated on this letter. Information on filing an appeal can be found on the Environmental Appeal Board website at http://www.eab.gov.bc.ca/.

If you have any questions or concerns regarding the document issued or the content of this letter, please contact the South Coast Office at WaterActReferrals.LowerMainland@gov.bc.ca.

Sincerely,

Barbara Sutherland

Barbara Sutherland
Assistant Water Manager

pc: David Neufeld | ISL Engineering and Land Services Ltd. | dneufeld@islengineering.com
Kristen Endacott | Ministry of Forests | kristen.endacott@gov.bc.ca
People of the River Referral Office (PRRO)
Katzie First Nation
Kwikwetlem First Nation
Musqueam Nation
Seabird Island
Shxw'ow'hamel First Nation

BRITISH COLUMBIA

November 2, 2023 Approval Number: 2008929

APPROVAL

WATER SUSTAINABILITY ACT - Subsection 11(1)
(Changes in and about a stream)

CITY OF COQUITLAM

is hereby authorized to make changes in and about a stream as follows:

(a) The names of the streams are Partington Creek and three drainage ditches (Ditches 1, 2 and 3) that flow to DeBoville Slough.

(b) The changes to be made in and about the stream are:

1. Realignment of Cedar Drive and creation of multi-use path within existing alignment.
2. Isolation and temporary bypass of Partington Creek.
3. Construction of one in-line sediment pond within Partington Creek.
4. Construction of one off-line sediment pond adjacent to Partington Creek.
5. Widen and deepen a 262-metre-long section of Partington Creek (Main channel Station 0+005 – 0+270).
6. Construction of an approximately 600 metre long by 20 metre wide off-channel habitat (Off-channel Station 0+020 – 0+605) to provide enhanced rearing habitat for salmonids.
7. Installation of nine (9) total concrete box culverts designed to facilitate fish passage and to connect flows of Partington Creek to the off-channel habitat.
8. Installation of a 99.9 meter long 600 millimeter diameter Reinforced Concrete Culvert for bypass during maintenance.
9. Infill of a portion of Class B agricultural ditches.
10. Enhancement of Class B ditches converting them to Class A habitat.
11. Infill of a portion of Class AO agricultural ditches.
12. Enhancement of Class AO ditch converting them to Class A habitat.
13. Removal of riparian areas within alignments of new Cedar Drive roadway, multi-use path, and service road near sediment pond.

14. Restoration planting of native riparian vegetation surrounding the in-line sediment pond, off-channel and Cedar Drive.
15. Installation of proposed 450 millimeter diameter PVC gravity sewer main to cross Partington Creek for the proposed development sanitary service connection at property #4189.
16. At northern extent of project, at Gilley's Trail, install an outlet structure within the off-channel connected to a new 600 millimeter concrete storm main, tie-in with existing storm main at Gilley's Trail.
17. Construction of maintenance access roads for future maintenance within the in-line and off-line sediment ponds.

All works shall occur within municipal road right-of-way allowance dedicated as Cedar Drive.

(c) The location of the works are at the following coordinates, as provided by the applicant: 49.2908100, -122.7212400.

(d) The works authorized in this Approval shall be completed on or before September 15, 2026.

(e) All works associated with the Effectiveness Monitoring Plan, as outlined in clause (aa) below, shall be completed by December 1, 2036, ten years after the works are completed.

(f) Work in the stream and stream channel shall occur only during the period of August 1 to September 15.

(g) All works shall be completed within the designed project footprint and in accordance with the following documents. Any major changes to the design must be submitted to the Water Manager for written authorization.

1. Fisheries Act Authorization Supplemental Information Report, dated June 2022, prepared by ISL Engineering and Land Services Ltd.
2. "21-HPAC-01506 Response to Conveyance and Off-channel Habitat, Partington Creek, Coquitlam – Application for a Fisheries Act Authorization [Cedar Drive Relocation Project] – Application Incomplete", dated November 2022, prepared by ISL Engineering and Land Services Ltd.
3. Environmental Management Plan Cedar Drive/Partington Creek Upgrades and Off-Channel Enhancement Habitat, dated May 2022, prepared by ISL Engineering and Land Services Ltd.
4. Cedar Drive Upgrades – Stormwater Modelling Technical Memorandum, dated April 21, 2022, prepared by ISL Engineering and Land Services Ltd.
5. Archaeological Resource "Chance Find Management Protocol" (CFMP) Field Manual, dated November 15, 2021, prepared by Antiquus Archaeological Consultants Ltd.

6. "Partington Creek Enhancement Habitat", Drawings 43 through 49 0f 54, dated May 11, 2022, prepared by ISL Engineering and Land Services Ltd.
7. Monitoring program for Project 21-HPAC-01506 (Partington Creek in Coquitlam), dated February 2023, prepared by ISL Engineering and Land Services Ltd.

(h) The holder of this Approval must provide as-built drawings post-construction within 60 days of completion of the works. The drawings must include all modifications made from the initial drawings during the construction process and include justification for the modifications. The drawings must be labelled with this Approval file number and labelled in the subject line of the email and submitted to SouthCoastWSAReporting@gov.bc.ca.

(i) All work shall be carried out in accordance with the Provincial "Requirements and Best Management Practices for Making Changes In and About a Stream in B.C." (2022). The Provincial guidance document can be found at the following link: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/wsa-cias-requirements-bmps.pdf

(j) The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall:

1. Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.
2. Where applicable, assist in the isolation of the stream prior to the commencement of works.
3. Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.
4. Supervise all instream works authorized under this Approval.
5. When the works involve temporary diversions to isolate the work site,
    i) Monitor all diversion works daily to ensure pumps and flow bypasses are in proper working condition;
    ii) Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the "Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater" (Fisheries and Oceans Canada, 2020); and
    iii) Ensure fish are prevented from entering the works.
6. When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,
    i) Attend the site prior to conducting any instream works to complete fish and wildlife search and salvage(s);

ii) Obtain any permits needed prior to undertaking the salvage(s); and
iii) Inspect the extraction area for fish stranding at least once after water levels have declined.

7. Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate must be on site during all phases of construction in and around the stream to ensure this component is upheld.
8. Report any spills including detailed information such as time of day, staff involved, nature, cause, and degree of spill, recovery process deployed, and agencies notified.
9. In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, an appropriately Qualified Professional must immediately mitigate the situation. Within 48 hours, each incident must be reported to the Water Manager at SouthCoastWSAReporting@gov.bc.ca with the Approval number in the subject line. The incident report shall describe mitigation measures employed and a rationale as to why works have resumed, or the next steps required before works may resume. The holder of this Approval must follow the advice of the appropriately Qualified Professional.

(k) Work must be carried out during favourable weather and low flow.

(l) Upon commencement of the project, the work shall be pursued to completion as quickly as possible.

(m) All proposed works shall be completed in isolation of the stream flows.

(n) All equipment and machinery used in or near the stream channel:

1. Must be in good operating condition and free of leaks, excess oil, and grease;
2. Must have a spill containment kit readily accessible on-site. All staff must be trained in handling and applying a spill kit appropriately to any spills/incidents;
3. Refueling must occur a minimum of 30 metres away from all streams; and
4. Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and are readily or inherently biodegradable.

(o) Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities must be reported to the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.

(p) Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization. Care shall be exercised during all phases of the

work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances. All control measures must meet or surpass the Provincial "Requirements and Best Management Practices for Making Changes In and About a Stream in B.C. " (2022) and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the Province of British Columbia, 1993).

(q) Discharge and runoff water from the site into any watercourse(s) must comply with the BC Approved Water Quality Guidelines for the Protection of Aquatic Life (https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines) and/or the applicable Local Government Bylaw(s).

Water quality monitoring must be conducted by an appropriately Qualified Professional or a designate Environmental Monitor on every day in which instream works are being conducted. Measurements must be taken upstream of any works taking place and within the extent of the sedimentation downstream of where instream work is actively occurring. Measurements are to be taken immediately prior to works beginning, and then at regular intervals until the works are completed and may require additional frequency during wet weather conditions. Wet weather conditions will be defined as being equal to or greater than 25 millimetres of rainfall within a 24-hour period.

(r) All material utilized during construction shall be contoured and placed in a stable area such that it is not able to mobilize and managed to avoid entry into any stream or watercourse.

(s) Site preparation and construction of the works is to be carried out from the banks of the stream, thus minimizing disturbance to the stream.

(t) The holder of this Approval shall ensure that instream works are designed and installed so as not to restrict fish passage and/or lead to fish stranding. The works shall not result in depressions that have the ability to trap fish and other aquatic life.

(u) All temporary works shall be removed on completion of the project, and the stream channel restored to its natural condition.

(v) Vegetation along the banks of the stream shall be disturbed as little as possible. All disturbed areas must be restored using native vegetation that is suitable for the site conditions.

(w) The hydraulic capacity of installed culvert(s) must be equivalent to the hydraulic capacity of the stream channel or be capable of passing the 1 in 200-

year maximum daily flow without the water level at the culvert(s) inlet exceeding the top of the culvert(s).

(x) Rock used as riprap shall be clean of any substances deleterious to aquatic life and shall be durable, angular in shape and suitably graded and sized to resist movement by stream flow. Any other engineering material required for the construction of the works shall be clean of any substances deleterious to aquatic life.

(y) The holder of this Approval shall apply for a water licence prior to completion of works issued under this approval for the long-term operation and maintenance of constructed sediment ponds.

(z) To address the instream and riparian impacts associated with the project, the holder of this Approval must, under the supervision of an appropriately Qualified Professional, create a minimum of 3970 square meters of instream off-channel habitat and enhancement of 1535 square metres of instream habitat within Partington Creek and creation of 17310 square metres of riparian habitat along Partington Creek that is consistent with the Ministry's Environmental Mitigation Policy and Procedures and will form part of the Habitat Compensation Plan.

(aa) The holder of this Approval must retain an appropriately Qualified Professional to design, implement and report on the effectiveness of mitigation, restoration, and/or offsetting measures required in this Approval. This includes the monitoring and maintenance of works, and implementation of any adaptive management measures.

The effectiveness monitoring term required for this Approval is 10 consecutive years following the completion of construction. Effectiveness Monitoring Reports must be submitted by December 1 of each calendar year for the duration of monitoring to SouthCoastWSAReporting@gov.bc.ca. The reports and subject line of the email must be labelled with this Approval file number.

The reports must include:

1. Documentation (including photographs) and summary of the survival of planted trees and shrubs. Tree survival rates must be 100%. Shrub and other plant survival rates must exceed 80%. Replanting may be required to achieve this success rate. If the area is susceptible to invasive species, the riparian planting plan should be modified to include a denser plant spacing as well as additional monitoring and maintenance to ensure an adequate plant survival rate of 80% can be achieved. It is recommended that trees and shrubs be protected from beavers and voles with metal fencing and vole

guards, respectively. Additional watering may be required during sustained hot and dry periods.

2. Observation and documentation (including photographs) related to flows and function of the restored or new channel and its features.

3. Seasonal observation records of fish and amphibian presence, including species composition and periodicity, time of year monitoring took place, and assessment of if and how the observations meet target values for that stream.

4. Assessment of fish stranding (direct observations of stranding, or potential stranding sites) within the newly constructed channel. Where stranding is, or is suspected to be, a problem, an appropriately Qualified Professional must provide solutions which are to be implemented by the holder of this Approval and described in the reports.

5. Summary detailing the monitoring, maintenance, and implementation of any adaptive management measures undertaken, such as additional channel complexing or modifications if required, to address habitat limitations such as insufficient flows, fish stranding, etc.

6. Water quality monitoring including but not limited to temperature, pH, and Dissolved Oxygen.

7. Monitoring of water levels including water depth, water flow and discharge.

The final monitoring report must include a signed statement from the appropriately Qualified Professional outlining the rationale for concluding monitoring or, if applicable, the next steps required before restoration works are considered functioning as intended. The holder of this Approval must follow the advice of the appropriately Qualified Professional.

Sincerely,

Barbara Sutherland

Barbara Sutherland
Assistant Water Manager

SCHEDULE 3

City of Coquitlam's Stream and Drainage System Protection Bylaw No. 4403, 2013

Coquitlam

City of Coquitlam
BYLAW

BYLAW NO. 4403, 2013

Consolidated with amendments in Bylaw Nos. 4606, 2015; 5273, 2022

NOTE: This is a consolidation for convenience purposes only and does not have the force of law.

A Bylaw to protect the stream and drainage systems in the City of Coquitlam

WHEREAS:

A. The *Community Charter*, S.B.C. 2003, c. 26 (the "*Community Charter*") authorizes Council to regulate, prohibit and impose requirements in relation to the protection of the natural environment;

B. The *Community Charter* authorizes Council to prohibit a person from fouling, obstructing or impeding the flow of a stream, creek, waterway, waterworks, ditch, drain or sewer;

C. The *Community Charter* authorize Council to require works and services for drainage collection and disposal; and

D. Council deems it in the best interests of the environmental well-being of the community that streams, creeks, waterways, watercourses, ditches, drains and sewers are protected from pollution, obstructions, sediment, and sediment laden water,

NOW THEREFORE, the Council of the City of Coquitlam, in open meeting lawfully assembled, ENACTS AS FOLLOWS:

1 Name of Bylaw

This Bylaw may be cited for all purposes as the "Stream and Drainage System Protection Bylaw No. 4403, 2013".

2 Interpretation

2.1 In this Bylaw, unless the context otherwise requires, the following words have the following meanings:

CITY means the City of Coquitlam;

CONSTRUCTION means erecting buildings and structures, and installing or repairing services, utilities and other engineering works, and includes but is not limited to, clearing, grading, excavating, filling, soil deposition or removal, landscaping, and land development, but does not include an activity that will not result in the disruption of any soil;

DEVELOPMENT means a subdivision or any *Construction* for which a building permit, conservation permit, development permit or tree cutting permit is required and shall also include the demolition of a building or structure where a demolition permit is required;

DEVELOPER means an owner, as defined in the Local Government Act, R.S.B.C. 1996, c. 323, who subdivides land, or applies for a building permit, conservation permit, development permit, tree cutting permit, demolition permit and includes a duly authorized representative of the Owner;

DRAINAGE SYSTEM means any natural, designed, constructed or installed system or network of streams, creeks, waterways, watercourses, waterworks, ditches, drains or sewers located in the City on private or public property that conveys, or is capable of conveying, drainage or runoff.

DELETERIOUS SUBSTANCE has the same meaning as defined in the *Fisheries Act,* R.S.C. 1985, c. F-14, as amended.

EROSION AND SEDIMENT CONTROL (ESC) FACILITIES means all erosion and sediment control works, measures, facilities and methods constructed, installed or employed to reduce the likelihood of sediment and sediment laden water reaching the *Drainage System* during all stages of *Development*.

EROSION AND SEDIMENT CONTROL (ESC) PLAN means the specifications, drawings, plans, phased *Development* schedules and design calculations of a Professional Engineer or Certified Professional in Erosion and Sediment Control in accordance with Schedule B of this Bylaw.

EROSION AND SEDIMENT CONTROL (ESC) SUBMISSION FORM means the documentation and related submission requirements in the format prescribed for that purpose by the *Manager*.

EROSION AND SEDIMENT CONTROL (ESC) SUPERVISOR means a *Qualified Professional* who is experienced in implementing *ESC Plans* and who is responsible for the inspection and monitoring of *ESC Facilities* to ensure these are installed and maintained in accordance with the *ESC Plan*, and if necessary, are modified during *Development* to ensure compliance with the requirements of this Bylaw;

MANAGER means the General Manager of Engineering and Public Works or his or her designates;

PRE-DEVELOPMENT APPROVAL means *City* acceptance to proceed with *Development* following an on site meeting involving City staff, the *ESC Supervisor* and the *Developer*;

QUALIFIED PROFESSIONAL means an individual, whether acting alone or together with another Qualified Professional, who:

(a) is registered, in good standing, and acting under the Code of Ethics, of one or more of the following professional organizations: Association of Professional Engineers and Geoscientists of BC; Association of BC Forest Professionals; College of Applied Biology; Applied Science Technologists and Technicians of BC; BC Institute of Agrologists; EnviroCert International (Certified Professional in Erosion and Sediment Control); or BC Society of Landscape Architects,

(b) is registered, in good standing, and acting under the Code of Ethics of the Erosion and Sediment Control Association of British Columbia,

(c) has an area of expertise that is recognized in the field of Erosion and Sediment Control as one that is acceptable for the purpose of providing all or part of the design, inspection and monitoring of *ESC Facilities; and*

(d) is acting within their area of expertise;

REAL-TIME MONITORING FACILITIES means the facilities described in Schedule "D".

SIGNIFICANT RAINFALL EVENT means any precipitation event, which meets or exceeds the intensity of 25 mm per 24 hour period;

TURBIDITY means the measurement of the suspended particulate matter in water, which affects the clarity or degree of transparency of the water by interfering with the passage of a beam of light through the water. Turbidity values are generally reported in Nephelometric Turbidity Units (NTU);

WASTE has the same meaning as defined in the *Environmental Management Act,* S.B.C 2003, c. 53, as amended.

3 Prohibition of Discharge

3.1 No person shall obstruct or impede the flow of the *Drainage System*.

3.2 No person shall place, store, transport or dispose of any *Waste* or *Deleterious Substance* in such manner, so as to permit the likely escape of the materials into the *Drainage System*, or any part of it.

3.3 No person shall cause or permit to be released, directly or indirectly into the *Drainage System* any *Waste* or *Deleterious Substance*.

3.4 Without limiting the generality of s.3.3, no person shall cause or permit to be released, directly or indirectly into the *Drainage System* any sediment, earth, *Construction* or excavation wastes, cement, concrete, or other substances, which when mixed with water, will result in:

3.4.1 a pH value outside the range of 6.5 to 8.0; or

3.4.2 a discharge exceeding a Turbidity level of 25 NTU, except during and for 24 hours following a Significant Rainfall Event a discharge exceeding 100 NTU.

3.5 If during any *Construction* work, any *Waste*, *Deleterious Substance*, or water that exceeds the limits outlined in s.3.4, is being released directly or indirectly into the *Drainage System*, or otherwise impedes the *Drainage System* as described in s.3.1, the *Developer* performing the work must immediately notify the *City*, as well as the appropriate Federal and Provincial agencies.

4 Erosion and Sediment Control (ESC) Requirements

4.1 Every person who proposes to carry out *Development* under a building permit for single family or duplex residential dwellings shall first before carrying out any *Development* on the land:

4.1.1 submit a completed and signed *ESC Submission Form* in the format prescribed for that purpose by the *Manager*;

4.1.2 submit a non-refundable Infrastructure Inspection Fee as specified in the City of Coquitlam *Fees and Charges Bylaw, No. 4338, 2012* as amended; and

4.1.3 install the minimum *ESC Facilities* identified in Schedule A, and ensure these are maintained in good working order during all phases of *Development*.

4.2 Every person who proposes to carry out *Development* other than Section 4.1 shall first before carrying out any *Development* on the land:

4.2.1 submit to the *City* a completed and signed *ESC Submission Form* in the format prescribed for that purpose by the *Manager*, accompanied by:

4.2.1.1 an *ESC Plan* in accordance with Schedule “B” and, if applicable, Schedule “D” of this Bylaw, and to the acceptance of the *Manager*;

4.2.1.2 a certified cost estimate for the *ESC Facilities* design, installation, monitoring, and maintenance;

4.2.1.3 a non-refundable Administration and Inspection Fee as specified in the City of Coquitlam *Subdivision and Development Servicing Bylaw, No. 3558, 2003* as amended; and

4.2.1.4 security deposit in accordance with Section 7;

4.2.2 post on the land, advisory signage, in the format prescribed for that purpose by the *Manager*; and

4.2.3 obtain *Pre-Development Approval* from the *Manager*.

4.2.4 install the *ESC* Facilities identified in an approved *ESC Plan* including, but not limited to, the minimum *ESC Facilities* identified in Schedule A, and ensure these are maintained in good working order during all phases of *Development*.

4.2.5 for *Developments* identified in Section 1 Application of Schedule "D", install the *Real-Time Monitoring Facilities* and ensure these are maintained in good working order during all phases of *Development*.

4.3 Notwithstanding the provisions of Sections 4.1 and 4.2, in the case of *Development* under a building permit for single family or duplex residential dwellings, the *Manager* may require a *Developer* to comply with one or more of the requirements of Section 4.2 where the *Manager* considers this necessary for the protection of the *Drainage System*.

5 Exemptions From Erosion and Sediment Control (ESC) Submission Requirements

5.1 The *Manager* may waive one or more of the requirements of section 4.2 where in the opinion of the *Manager* the proposed *Development* is in response to an emergency, or can be shown to the *Manager's* satisfaction to have no negative impact on the *Drainage System*.

6 Erosion and Sediment Control (ESC) Implementation, Monitoring and Maintenance Requirements

6.1 Every person who proposes to carry out *Development* is responsible to ensure the site is in compliance with the Bylaw for the duration of *Development*, which includes ensuring that all *ESC Facilities* and *Real-Time Monitoring Facilities* are constructed, installed, implemented, and maintained for the duration of *Development*.

6.2 Where the requirements of section 4.2 apply, the *Developer* must:

6.2.1 appoint an *ESC Supervisor* who is a *Qualified Professional* trained in implementing *ESC Plans*;

6.2.2 ensure the *ESC Supervisor* implements an *ESC Plan* that has been prepared in accordance with Schedule B of this Bylaw;

6.2.3 ensure the *ESC Supervisor* conducts the inspection, monitoring and maintenance of the *ESC Facilities* in accordance with Schedule C of this Bylaw;

6.2.4 immediately notify the *City* and cease *Development*, if for any reason the *ESC Supervisor's* services are terminated or withdrawn, until a replacement *ESC Supervisor* is appointed;

6.2.5 where *Real-Time Monitoring Facilities* are required pursuant to this Bylaw, ensure the *ESC Supervisor* conducts the inspection and monitoring of *the Real-Time Monitoring Facilities* in accordance with Schedule "D" of this Bylaw; and

6.2.6 where *Real-Time Monitoring Facilities* are required pursuant to this Bylaw, ensure the *Real-Time Monitoring Facilities* provider conducts the inspection, maintenance and monitoring of the *Real-Time Monitoring Facilities* in accordance with Schedule "D" of this Bylaw.

6.3 Notwithstanding the provisions of Section 4.2.5 the *Manager* may require the installation of *Real-Time Monitoring Facilities* at any *Development* where one or more of the following conditions are met and the *Manager* considers this necessary for the protection of the *Drainage System*:

6.3.1 on 2 or more occasions, water with a turbidity level greater than 25 NTUs has been discharged into the *Drainage System* when a *Significant Rainfall Event* has not occurred during the preceding 24 hours;

6.3.2 on 2 or more occasions, water with a turbidity level greater than 100 NTUs has been discharged into the *Drainage System*; or,

6.3.3 on 2 or more occasions, water with a pH outside the range of 6.5 to 8.0 has been discharged into the *Drainage System*.

7 Erosion and Sediment Control (ESC) Security Requirements

7.1 The *Manager* may require a security deposit in an amount of 110% of the certified *ESC Facilities* design, installation, monitoring and maintenance cost or $5,000, whichever is greater, to secure the full and proper compliance with the provisions of this Bylaw.

7.2 If the amount of the security deposit is insufficient for the *City* to complete the remedial work, the *Developer*, will pay any deficiency to the *City* on demand.

7.3 When the *Developer* complies with the provisions of this Bylaw the *City* will return the security deposit at such a time as the *ESC Supervisor* provides the *City* with written notice that all *Development* at the site is complete, the site is stable and under control, and no longer poses a threat to the *Drainage System,* and the *ESC Facilities* have been removed to the acceptance of the *Manager*.

8 Remedial Action

8.1 If any person is carrying on any *Construction* work or any activity in contravention of this Bylaw, and which in the opinion of the *Manager* is causing or is likely to result in contravention of this Bylaw, then the *Manager* may order the immediate suspension of all or any portion of such *Construction* work or other activity by posting a notice to that effect at the place where the construction work or other activity is ongoing.

8.2 In addition to the authority of the *Manager* under section 8.1, the *Manager* may direct that steps be taken to prevent further contravention of this Bylaw. The *Manager* shall send a copy of the written notice to the owner of the land where the *Construction* or activity is occurring at the owner's address as it appears on the records of the Land Title Office, or other last known address.

8.3 If in the opinion of the *Manager* immediate steps should be taken to prevent the likely or ongoing contravention of this Bylaw, or if the *Manager* is not satisfied that the owner, or other responsible person, has taken appropriate steps to mitigate the damages, then the *City* may enter onto the property to take such steps as are necessary in the circumstances. The *Manager* must provide written notice of the actions taken or proposed.

9 Offence

9.1 Every person who violates any provision of this Bylaw, or who causes, permits or allows any act or thing to be done in violation of this Bylaw, or who neglects to or refrains from doing anything required to be done by any provision of this Bylaw, is guilty of an offence against this Bylaw and each day that a violation continues is deemed to be a separate offence against this Bylaw.

9.2 Every person who violates a provision of this Bylaw, or who causes, permits, or allows an act or thing to be done in violation of a provision of this Bylaw, or who neglects or refrains from doing anything required by a provision of this Bylaw, is guilty of an offence and is liable, upon summary conviction, to a fine not exceeding the maximum set out in the *Offence Act*, R.S.B.C. 1996, c. 338, as amended.

10 Severance

10.1 The provisions of this Bylaw are intended to be severable and, should any part of this Bylaw be found to be invalid by a court of competent jurisdiction, the finding of invalidity will not affect the validity of the remainder of this Bylaw.

11 Repeal and Transition

11.1 The *City of Coquitlam Sediment Control Bylaw No. 2929, 1995* is repealed in its entirety.

11.2 The *City of Coquitlam Stream and Drainage System Protection Bylaw No. 3447, 2001* is repealed in its entirety.

11.3 Notwithstanding section 11.2 of this Bylaw, the *City of Coquitlam Stream and Drainage System Protection Bylaw No. 3447, 2001* will continue to apply to *Development* work for which a permit, permission or approval of the *City* was required, and for which an application was received by the *City*, prior to the date of final adoption of this Bylaw.

READ A FIRST TIME this 29th day of July, 2013.

READ A SECOND TIME this 29th day of July, 2013.

READ A THIRD TIME this 29th day of July, 2013.

GIVEN FOURTH AND FINAL READING and the Seal of the Corporation affixed this 9th day of September, 2013.

_____ MAYOR

_____ CLERK

Schedule "A"

Topic **Erosion & Sediment Control (ESC) Submission Requirements**

The ESC provisions of the **Stream and Drainage System Protection Bylaw No. 4403, 2013** (the Bylaw) focus on preventing or minimizing the erosion of sediment, earth or soil from *Development* sites and the resulting discharge to the *Drainage System*. There are two categories of *Development*:

1. Single family and duplex residential.
2. All other.

The submission requirements for these two types of *Development* are detailed in the table below.

Submission Requirement	**Single Family/Duplex Residential, Demolition**	**All Other**
ESC Submission Form	✓	✓
ESC Plan		✓
ESC Facilities cost estimate		✓
ESC Pre-Development Approval Form (Completed at site with City staff)		✓
ESC security deposit in accordance with Bylaw		✓

Mandatory ESC Facilities

The following *ESC Facilities* from the City publication *Erosion & Sediment Control Best Management Practices* must be implemented and maintained in good working order for all *Development* sites:

- Clean Water Management (gutters and downspouts for single family/duplex sites) ;
- Access/Egress Controls;
- Perimeter Control Measures;
- Temporary drainage swale and sump;
- Storm Inlet Protection (where storm inlets exist);
- Disturbed Surfaces Protection ; and
- Paved Surfaces Sweeping/Maintenance.

The above list represents the minimum *ESC Facilities* for all *Development* sites, but it is the *Developer*'s responsibility to include any, and all, *ESC Facilities* that are necessary to ensure compliance with the Bylaw.

Schedule "B"

Topic **Erosion & Sediment Control (ESC) Plan Requirements**

An *ESC Plan* submitted to the City must:

- be designed, signed and sealed by a Professional Engineer (P.Eng.), registered and in good standing with the Association of Engineers and Geoscientists of B.C., or a Certified Professional in Erosion and Sediment Control (CPESC) registered and in good standing with EnviroCert International;

- be reviewed and signed by the *ESC Supervisor*;

- conform to the City's design submission requirements outlined in Schedule A, Part I of **Subdivision and Development Servicing Bylaw No. 3558, 2003**, as amended;

- consist of a multi-stage plan that shows the measures for erosion and sediment control during the following phases (where applicable):

    1. land clearing, grubbing and grading;
    2. the installation of services or infrastructure;
    3. the building construction;
    4. the maintenance period;

- include all mandatory minimum ESC Facilities as noted in Schedule "A", as well as the following information:

    1. location(s) of limits of disturbance for each phase of development;
    2. anticipated soil type in all areas to be disturbed and at all depths to be excavated;
    3. proposed measures to ensure that any existing ground cover is maintained as long as practicably possible, that work is staged to prevent erosion whenever possible, and that exposed soils are placed under non-erosive cover as soon as possible;
    4. proposed measures to address the erosion and sediment control requirements for clearing limits, cover measures, perimeter protection, traffic area stabilization (including detailed design of any necessary wheel washes), sediment retention, surface water control and dust control, with source controls being the primary method of erosion and sediment control;
    5. location of all proposed ESC Facilities to be implemented on site, including site access locations, sediment ponds and any necessary wheel wash facilities;

Schedule "B"

6. the design calculations, installation specifications and maintenance requirements for each ESC Facility;
7. for ESC Plans utilizing treatment chemicals, technical specifications including ecological toxicity data from the treatment chemical manufacturer and specifications for the location of treatment and general deployment;
8. the proposed methods to restore disturbed areas following the completion of development (where applicable, application rates and specifications for mulch must be clearly defined);
9. all other details pertaining to the proposed development, describing how the ESC Facilities will meet the criteria set out in Section 3 of the Stream and Drainage System Protection Bylaw No. 4403, 2013;
10. locations of property line(s) and other legal designations of the subject property or properties;
11. location(s) of existing underground services, as well as any proposed connections to existing services from the site;
12. location(s) of existing drainage infrastructure and the proposed measures to protect it;
13. location(s) of existing and proposed watercourses, ditches, swales or other bodies of water within 50m of the site boundaries, along with the proposed protection measures;
14. location(s) of existing and proposed buildings, including residential buildings or ancillary buildings or structures;
15. existing and proposed contours and relevant spot elevations;
16. the name, address and telephone number of the ESC Supervisor;
17. location(s) of water quality monitoring site(s); and
18. the proposed monitoring and inspection schedule.

Schedule "C"

Topic **Responsibilities of the Erosion & Sediment Control (ESC) Supervisor**

1. ESC Supervisor Qualifications

The *ESC Supervisor* is defined by the **Stream and Drainage System Protection Bylaw No. 4403, 2013** (the Bylaw) as a *Qualified Professional* who is experienced in implementing *ESC Plans* and ESC best management practices. While the *ESC Supervisor* is the person responsible for site inspections, monitoring and reporting, a suitably qualified individual acting under the direction of the *ESC Supervisor* can conduct site monitoring and inspections. The *ESC Supervisor* must, however, sign off on all correspondence with the City and be ultimately responsible to identify and address ESC issues as they arise.

2. ESC Supervisor Responsibilities

The primary duties of the *ESC Supervisor* are:

a) assisting the Professional Engineer (P.Eng.) or Certified Professional in Erosion and Sediment Control (CPESC) in preparing the *ESC Plan* and acknowledging/signing the *ESC Plan*;

b) attending the pre-*Development* meeting held with the City;

c) inspecting, maintaining, monitoring and reporting on the *ESC* Facilities, which include, but are not limited to:

- monitoring/inspecting the site to ensure *ESC Facilities* are implemented according to the *ESC Plan*, through all phases of *Development*;
- advising the Engineer/CPESC and/or *Developer* of any ESC deficiencies and/or corrective actions required to adapt to changing site conditions or unforeseen problems that arise regarding erosion and sediment control;
- requiring the suspension of *Development* based on pending or existing weather conditions or based on unusual, unacceptable or inappropriate *Development* practices to ensure compliance with the Bylaw; and
- coordinating the removal of *ESC Facilities* with site decommissioning.

d) maintaining a logbook of all inspections, and making the logbook available to the City upon request; and

e) delivering written notice to the City's assigned Engineering Inspector and Environmental Services Division staff when all Development at the site is completed, the site is stable and under control and no longer poses a threat to the Drainage System and the ESC Facilities may be safely removed

Schedule "C"

3. Inspection, Monitoring and Reporting Frequency

Regular and ongoing inspections of *ESC Facilities* and adhering to the *ESC Plan* are crucial to compliance with the Bylaw. To ensure that the prescribed *ESC Facilities* remain effective, regular inspections and maintenance must be conducted though all phases of *Development*. Site inspections must include daily visual checks that target critical areas on and off the site as per the **Daily Site Inspection Checklist** available from the City's website. The *ESC Supervisor* must ensure that copies of the checklists are kept on site and made available for inspection by City staff. Under the guidance of the *ESC Supervisor*, daily inspections may be conducted by suitably qualified on-site personnel (such as the site superintendent or designate).

In addition to the daily site inspections, water quality monitoring by the *ESC Supervisor*, or suitably qualified designate, of the site discharge, as well as assessments of the condition and performance of *ESC Facilities* must be conducted and reported to the City' Environmental Services Division at the minimum regular intervals noted in Table C-1, below. Summary reports shall include a review of *ESC Facilities* implemented and any deficiencies observed, maintenance undertaken, or recommendations of adaptive measures to ensure compliance with the approved *ESC Plan*. A summary table of in-situ monitoring results and/or laboratory analysis results must be also be included in the submitted report (see **ESC Site Monitoring Report Template** available from the City's website).

Table C-1. Monitoring and Reporting Frequencies.

	Minimum monitoring frequency	**Minimum reporting frequency**
Wet season (October 15 to May 15)	Weekly	Bi-weekly
Dry season (May 16 to October 14)	Bi-weekly	Monthly
Significant Rainfall Events	48 hours prior to event; During and within 24 hours of event	Within 7 days of event

Although the Bylaw requires post-event monitoring after a *Significant Rainfall Event*, spot checks should be conducted during these events to evaluate *ESC Facility* performance under storm flow conditions when the likelihood of deficiencies is more prevalent. If a *Significant Rainfall Event* is forecast (via Environment Canada or other) or anticipated, the *ESC Supervisor* must, 48 hours prior to the event, conduct an onsite *ESC Facilities* review meeting with the *Developer* and site superintendent and document this meeting using the **Significant Rainfall Event Planning Checklist** available from the City's website.

Schedule "C"

4. Inspection and Monitoring Parameters

a) Turbidity (NTUs)

Water turbidity will be used as an in-situ indicator for the level of sediment concentration within site storm water discharge. As per section 3.4 of the Bylaw, no person shall cause or permit the discharge into the *Drainage System*, either directly or indirectly, of water which has a turbidity level greater than 25 NTUs. Where a *Significant Rainfall Event* has occurred within the preceding 24 hours, water with a turbidity level greater than 25 NTUs may be discharged into the drainage system during a 24 hour grace period provided that no discharge into the drainage system may exceed 100 NTUs. Monitoring locations shall be based on the designated monitoring locations in the approved *ESC Plan*.

b) pH

Concrete works or the use of recycled concrete aggregate (RCA) can result in very alkaline (high pH) site runoff. As per section 3.4 of the Bylaw, no person shall cause or permit the discharge into the Drainage System, either directly or indirectly, of water which has a pH value outside of 6.5 – 8.0. Monitoring locations shall be based on the designated monitoring locations in the approved ESC Plan.

c) Water Quality Sampling Locations

Water quality monitoring locations should appropriately reflect site discharge at the down stream boundary of the Development site and be independent of drainage ditches that convey off site storm water flows. If the primary point of discharge is piped flow or if there is a potential for storm water flows conveyed off-site as piped flow, then water quality sampling must be conducted of flows as they leave the site.

d) ESC Facilities: Installation and Condition

The ESC Supervisor is required to conduct visual inspections to ensure that all ESC Facilities are installed in accordance with the approved ESC Plan. The inspections should identify any installation deficiencies that could impair the ESC Facilities performance and notify the Developer or designate to remedy the deficiency. Time and date-stamped photos must be taken for inclusion in the monitoring report.

e) ESC Facilities: Maintenance and Performance

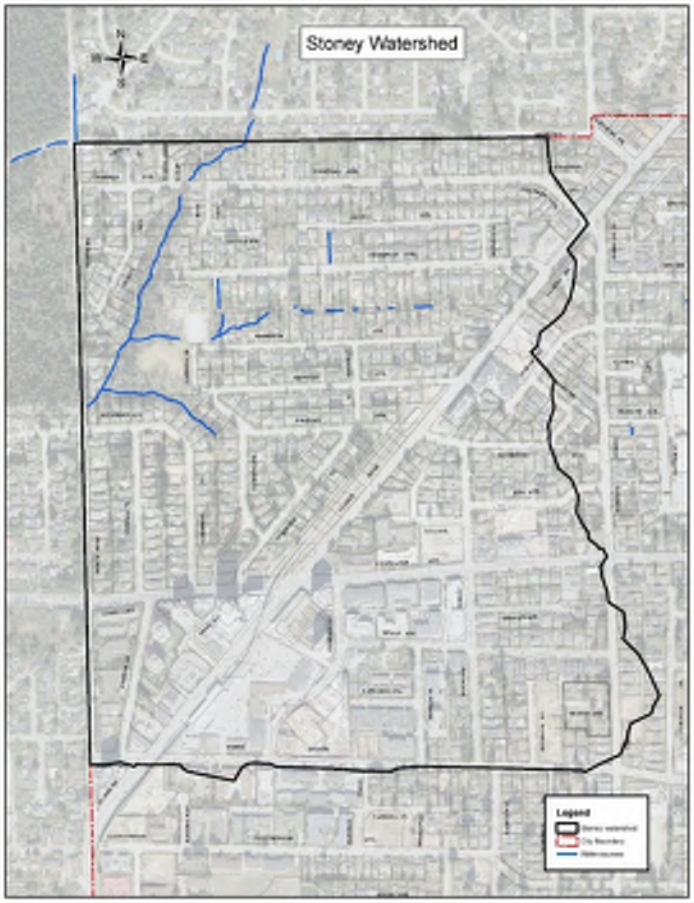
It is the responsibility of the ESC Supervisor to identify any maintenance issues that need addressing whereby the effectiveness of the ESC Facilities is likely to be compromised. Likewise it is up to the discretion of the ESC Supervisor to evaluate whether or not the installed ESC Facilities are capable of meeting the ESC requirements of the ESC Plan and ensure that measures are undertaken to mitigate any potential deficiencies in the ESC Facilities.

Schedule "D"

Topic **Real-Time Monitoring Facilities**

1. Application

1.1. The requirements in this Schedule "D" apply to *Developments* within the Stoney Creek watershed shown outlined in bold on the following map:



1.2. Notwithstanding the provisions of section 1.1 the requirements of Schedule "D" do not apply to the following *Developments*:

1.2.1. *Developments* that only require a demolition permit as defined in The City of Coquitlam Building Bylaw No. 3598, 2003, as amended or replaced from time to time; and,

1.2.2. The following *Developments* as defined in the City of Coquitlam Zoning Bylaw No. 3000, 1996, as amended or replaced from time to time:

- *Triplex Residential*
- *Fourplex Residential*
- *Multiplex Residential*

Schedule "D"

2. *Real-Time Monitoring Facilities* for Construction Site Discharge Water Quality

2.1. Variations of these Requirements

2.1.1. Minor variations or alternates to these requirements are permitted at the discretion of the *Manager*.

2.2. ESC Plans

2.2.1. Where this Schedule "D" applies, the *ESC Plan* must include all *Real-Time Monitoring Facilities* required by this Schedule "D" including but not limited to the following:

- The location of all *Real-Time Monitoring Facilities* on site;
- Drawings and schematics detailing all *Real-Time Monitoring Facilities*;
- Any Notification Limits or Shut Off Limits required in addition to the minimum requirements listed in Section 2.5 Notification and Shut Off Limits;
- The design calculations, installation specifications and maintenance requirements for the *Real-Time Monitoring Facilities;* and,
- Timing for installation and removal of the *Real-Time Monitoring Facilities*.

2.3. *Real-Time Monitoring Facility* Design, Operation and Maintenance

2.3.1. *Real-Time Monitoring Facilities* must be designed by a *Qualified Professional*;

2.3.2. *Real-Time Monitoring Facilities* must be installed, operated, calibrated and maintained in accordance with the designer's and manufacturer's recommendations as described in documented Standard Operating Procedures supplied by the *Real-Time Monitoring Facilities* provider. The *City* may require that a copy of these procedures is provided to the *City*, a copy must be available for inspection on site.

2.3.3. Date and time-stamped administrative activity logs including maintenance, parts replacement, calibrations and other servicing must be kept available for inspection on site or made available to the *City* and *ESC Supervisor* through the dashboard.

2.3.4. The *ESC Supervisor* must carry out the responsibilities described in Schedule "C" and must also:

- complete routine inspections of the *Real-Time Monitoring Facilities* in accordance with the Standard Operating Procedures;
- compare data collected during monitoring under Schedule "C" to data provided by the *Real-Time Monitoring Facilities,* investigate any discrepancies outside the limits of accuracy for any analysis, and take any remedial action required to ensure accuracy of the data collected by routine monitoring and by the *Real-Time Monitoring Facilities*.

Schedule "D"

2.4. Water Quality Parameters

2.4.1. *Real-Time Monitoring Facilities* must provide monitoring of at least the following water quality parameters:

- pH;
- turbidity measured in NTU or FNU;
- temperature measured in ^{o}C;
- discharge flow rate measured in cubic metres per second or litres per second;
- cumulative discharge volume measured in cubic metres or litres; and,
- recirculation flow rate measured in cubic metres per second or litres per second.

2.4.2. The *Real-Time Monitoring Facilities* must obtain and report on local rainfall data from an accredited source which will provide data to the system allowing for shut off in the event that turbidity exceeds limits linked to *Significant Rainfall Events*.

2.4.3. The water quality parameters listed in Section 2.4.1 will be sampled no less frequently than once every 45 seconds.

2.5. Notification and Shut Off Limits

2.5.1. The *Real-Time Monitoring Facilities* will provide automated SMS and email notifications to the *City*, the *ESC Supervisor* and appropriate site staff whenever the following notification limits are reached and at any additional limits specified by the *ESC Plan*:

Parameter	**Notification Limit**
pH	When pH is less than 6.5; and, When pH is above 8.0
Turbidity	No Significant Rainfall Event and turbidity is greater than 25 NTU for 60 seconds; and Turbidity is greater than 100 NTU for 60 seconds
Valve State	The discharge valve is closed for 60 minutes
Data Transmission	No data transmission for one or more sensors for 15 minutes

2.5.2. The Notification Limits for a particular *Development* may be changed at the discretion of the *Manager*;

2.5.3. The *Real-Time Monitoring Facilities* will automatically shut off discharge and recirculate the storm water for further treatment whenever the following shut of limits are reached and at any additional limits specified by the *ESC Plan*:

Schedule "D"

Parameter	Shut Off Limit
pH	When pH is below 6.5 for 5 min; and When pH is above 8.0 for 5 min
Turbidity	No Significant Rainfall Event and turbidity is greater than 25 NTU for 5 mins; and Turbidity is greater than 100 NTU for 5 mins
Power Failure	In the event of a power failure to the *Real-Time Monitoring Facilities* or the *ESC Facilities*, the discharge shut off valve must close automatically and remain closed until full functioning is restored

2.5.4. The *Manager* may require that the Shut Off Limits be changed in the event that these limits do not ensure that the *ESC Facilities* are able to treat the storm water to the extent that it complies with the requirements of this Bylaw and any other applicable legislation.

2.6. Data Sharing Capabilities

2.6.1. The *Real-Time Monitoring Facilities* will include a cloud-based data sharing dashboard that provides the following information and capabilities to the *City* and the *ESC Supervisor*:

- Real-time and historical data for all monitored water quality parameters and rainfall data;
- historical data must be available from the start of the *Development* to such time as the *Manager* or their designate grants permission for the removal of the *Real-Time Monitoring Facilities*;
- the dashboard must also allow for the download of all data related to the *Development* to pdf or excel format;
- the dashboard must show the notification limits and shut off limits in use at all times
- the dashboard must show the maintenance record and any other periods during which the *Real-Time Monitoring Facilities* are not operational.

SCHEDULE 4
Sample Project Contact List

Project Contact List

CONTACT	NAME	OFFICE #	CELL/PAGER #	24 HOUR #
Contractor	TBD	TBD	TBD	TBD
Site Supervisor/Foreman	TBD	TBD	TBD	TBD
Contract Administrator	TBD	TBD	TBD	TBD
Engineer Inspector	TBD	TBD	TBD	TBD
Environmental Lead ISL	David Neufeld	604-371-0091	604-754-3996	604-754-3996
Environmental Monitor ISL	Mackaylen Bickle	604-371-0091	905-809-1170	905-809-1170
Responsible Authority Fisheries and Oceans Canada (DFO)	-	-	-	**1-800-465-4336**
Ministry of Water Land and Resource Stewardship (MWLRS)	-	-	-	**1-800-663-7867**
Emergency Management BC	-	-	-	**1-800-663-3456**
TBD = To be determined after award				

SCHEDULE 5
Reference Sample Spill Response Plan and Flowchart

Reference Spill Response Procedures

INCIDENT

If a spill of fuel, oils, lubricants or other harmful substances occurs at the site, the following procedures will be implemented.

Spill Response Steps
1. **ENSURE SAFETY**
2. **STOP THE FLOW** (when possible)
3. **SECURE THE AREA**
4. **CONTAIN THE SPILL**
5. **NOTIFY/REPORT** (PEP 1-800-663-3456)
6. **CLEAN-UP**

(Circumstances may dictate another sequence of events)

1. ENSURE SAFETY

- Ensure Personal, Public, and Environmental Safety
- Wear appropriate Personal Protective Equipment (PPE)
- Never rush in, always determine the product spilled before taking action
- Warn people in immediate vicinity
- Ensure **no ignition sources** if spill is of a flammable material

2. STOP THE FLOW (when possible)

- Act quickly to reduce the risk of environmental impacts
- Close valves, shut off pumps or plug holes/leaks, set containers upright
- Stop the flow of the spill at its source

3. SECURE THE AREA

- Limit access to spill area
- Prevent unauthorized entry onto site

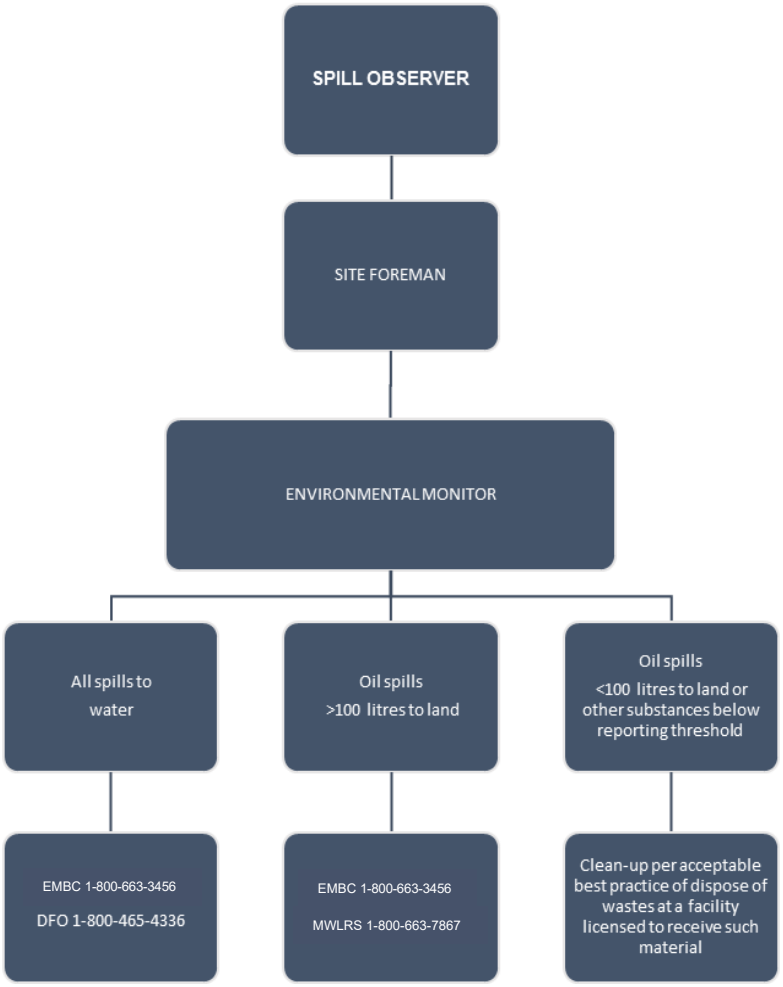
4. CONTAIN THE SPILL

- Block off and protect ditches, drains and culverts
- Prevent spilled material from entering drainage structures (ditches, culverts, drains)
- Use spill sorbent material to contain spill
- If necessary, use a dike, berm or any other method to prevent any discharge off site
- Make every effort to minimize contamination
- Contain as close to the source as possible

5. NOTIFY/REPORT

- Notify Site Supervisor and EM (or alternate) of incident (provide spill details)
- When necessary, the first external call should be made to (see spill reporting requirements): **Environmental Management BC (EMBC) 1-800-663-3456 (24 hours)**
- Provide necessary spill details to other external agencies (see spill reporting requirements)

Spill Response/Incident Response Notification Chart



SCHEDULE 6
Spill Reporting Regulation List of Reportable Quantities

SPILL REPORTABLE QUANTITIES

Should there be a spill of materials or products that exceed the thresholds in the table below, the EM will report to Emergency Management BC per the Spill Reporting Regulation. An Environmental Incident will be deemed to have occurred and the procedures set out in Section 6.11 and in Schedule 5 will be instituted.

Substances as defined in the Federal Regulations or Hazardous Waste Regulation (HWR)	Quantity
Class 1, Explosives as defined in section 2.9	≤50 kg, if the substance poses a danger to public safety
Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a)	10 kg
Class 2.2 Non-flammable and Non-toxic Gases as defined in section 2.14 (b)	10 kg
Class 2.3, Toxic Gases as defined in section 2.14(c)	5 kg
Class 3, Flammable Liquids as defined in section 2.18	100 L
Class 4, Flammable Solids as defined in section 2.20	25 kg
Class 5.1, Oxidizing Substances as defined in section 2.24 (a)	50 kg or 50 L
Class 5.2, Organic Peroxides as defined in section 2.24 (b)	1 kg or 1 L
Class 6.1, Toxic Substances as defined in section 2.27 (a)	5 kg or 5 L
Class 8, Corrosives as defined in section 2.40	5 kg or 5 L
Class 9, Miscellaneous Products, Substances or organisms as defined in section 2.43	25 kg or 25 L
Leachable toxic waste as defined in section 1 of the HWR	25 kg or 25 L
Waste containing PAH's as defined in section 1 of the HWR	5 kg or 5 L
Waste asbestos as defined in section 1 of the HWR	50 kg
Waste oil as defined in section 1 of the HWR	100 L
Waste that contains a pest control product as defined in section 1 of the WWR	5 kg or 5 L
PCB wastes as defined in section 1 of the HWR	25 kg or 25 L

Not-withstanding the reportable quantities list above, all spills to water are reportable.

Appendix D -

Archaeological Chance Find Procedures

ARCHAEOLOGICAL RESOURCE "CHANCE FIND MANAGEMENT PROTOCOL" (CFMP) FIELD MANUAL

For Land-Altering Activities to be Conducted on Cedar Drive (Cedar Sanitary Pump Station and Gilleys Trail)

Prepared for:

City of Coquitlam
3000 Guildford Way
Coquitlam, BC
V3B 7N2

Prepared by:

ANTIQUUS ARCHAEOLOGICAL CONSULTANTS LTD.
23021 – 132 Avenue,
Maple Ridge, B.C.,
V4R 0A8

November 15, 2021

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KEY AGENCY AND PERSONNEL CONTACT INFORMATION

Agency or Company	Main Contact Person	Phone Number/ Email Address
***Antiquus Archaeological Consultants Ltd.**	**Mike Rousseau** (Senior Archaeologist)	604-467-3497 antiquus@shaw.ca
Archaeology Branch, Victoria	**Paula Thorogood** (Manager of Archaeological Operations, Archaeology Branch)	250-953-3334 Paula.Thorogood@gov.bc.ca
	Ryan Blackburn (Project Officer, Archaeology Branch)	(236) 478-2545 Ryan.S.Blackburn@gov.bc.ca
Kwikwetlem First Nation	**Nicole Oakes** (KFN Archaeologist)	(778)-886-8200 nicole@brownoakesarch.com fieldwork@kwikwetlem.com
City of Coquitlam	Nadeem Kazmi (Project Manager)	(604) 927 3517 nkazmi@Coquitlam.ca
ISL Engineering Inc.	Kevin Terness (Senior Engineer)	(604) 629 2696 kterness@islengineering.com
General Contractor (TBD)	TBD	TBD

***Note:** **Agencies/Companies presented in red should be contacted immediately following an encounter with any suspected archaeological deposits.**

A list of additional local qualified consulting archaeologists is presented in the online website sponsored by the "BC Association of Professional Archaeologists" (BCAPA).

1.0 INTRODUCTION

This chance find management protocol (CFMP) document manual provides a guideline to follow in case archaeological materials are uncovered on a worksite without an experienced archaeological monitor present. ***Machine operators and any personnel involved with land-altering activities that have direct visual contact with the ground during construction should become familiar with the content of this manual, and keep a copy handy when engaging in any ground disturbances caused by heavy machinery.***

Archaeological materials such as lithic (stone) tools, worked fauna (animal bones), and preserved basketry are non-renewable resources that can provide valuable information about local First Nation cultural heritage. Even small disturbances to a site can destroy the context needed to properly assess how people may have lived in a specific area many hundreds or thousands of years ago. The scientific and educational information we receive from a single site can never be replicated, and is highly significant to First Nation communities, archaeologists, the BC Provincial Government, and the general public. Any development activities that include ground alterations have the potential to adversely impact archaeological materials. This could even include areas that have been significantly disturbed in the past, or areas with imported construction fill that was transported from a different archaeological site.

We appreciate your company's cooperation in ensuring that any suspected fortuitous cultural materials that may be uncovered by ground disturbances are managed and handled properly.

Figure 1. Construction in progress within an archaeological site.

2.0 FIRST NATIONS CULTURAL HERITAGE

Since the widespread colonization of British Columbia in the mid 19th century, there has been continued destruction of indigenous culture, language and traditional ways of life. Today, the protection of First Nation Cultural Heritage plays a vital and meaningful role in rebuilding First Nation identity through knowledge, education and respect.

Indigenous Cultural Heritage is a broad term that encompasses traditional knowledge and archaeological materials to form meaningful ideas about First Nation collective identity. Cultural Heritage consists of things that can be seen and studied (like the artifacts collected in archaeological studies), and intangible traditional knowledge (like oral history, songs, and dance). There are over 200 individual First Nation groups in British Columbia alone, and each has a unique cultural heritage.

By equipping companies such as yours with the resources and education to properly identify and manage chance archaeological finds in the workplace, we can continue to contribute important information towards reconstructing past indigenous cultural heritage traits and histories, and where possible, preserve valuable archaeological deposit so that they remain intact into the future. Archaeological resources are very fragile and non-renewable, and once they are disturbed, their information value is severely lessened.

Figure 2. Small carved stone bowl found during construction monitoring at a site in 2018.

3.0. GENERAL CHANCE FIND PROTOCOL PROCEDURE

It is the responsibility of the site supervisor to ensure that the procedures outlined below are done according to the standards and procedures outlined in this document. It is important for all on-site workers to be familiar with, and understand the importance of this protocol and what archaeological materials and deposits look like (see Figures 3 to 10). In some situations, it may be prudent to have an archaeologist meet with the machine operators and management personnel prior to the start of construction to go through the expected protocol procedure. If there are any questions regarding the content of this CFMP, please contact Antiquus Archaeological Consultants Ltd. ***If any obvious cultural/archaeological materials are encountered, or their presence is suspected, please follow the guidelines below.***

1. **STOP ALL LAND-ALTERING WORK** in the vicinity that the cultural materials were uncovered (within immediate 20 m diameter area), cease all land-alterations. This includes heavy vehicle traffic. Secure the discovery location to prevent any further disturbance.

2. **CONTACT MANAGEMENT & ARCHAEOLOGISTS.** Immediately contact the on-site construction property superintendent, and then phone a consulting archaeologist (e.g., Antiquus Archaeological Consultants Ltd. The archaeological consultant will get in touch with relevant First Nation agencies, the Archaeology Branch, and local RCMP and Coroner if necessary. Relevant agency and personnel contact information is presented on page 3.

3. **LEAVE MATERIALS WHERE YOU FIND THEM.** If possible, record the location of cultural materials you find with GPS and take pictures. Do not remove any artifacts, surrounding sediments or previously removed backfill.

Once the following steps have been completed, an archaeologist and local First Nation representatives will arrange to inspect the suspected cultural material as soon as possible to determine if an archaeological site has indeed been uncovered. ***If the suspected archaeological materials are confirmed to be archaeological, the consultant, in consultation with local First Nation community members, will determine the extent and significance of the findings. Management strategies will then be discussed and formulated by the consultant, the Archaeology Branch and local First Nation agencies.*** Management and mitigative options will then be presented to the client for consideration. ***If any observed suspected cultural materials are found to be non-archaeological by the attending archaeologist, land-altering work can then resume as normal without further delay.***

4.0 PRE-CONTACT ANCESTRAL REMAINS PROTOCOL

If any ancestral human remains are encountered on the worksite, it is extremely important to follow proper procedures to ensure remains are treated with respect and care no matter if they are intact or not. Human bones buried for prolonged periods may vary through shades of white, tan/beige, yellow/orange, and sometimes orange in colour; most limb and appendage elements are long and straight; most bones are fairly large compared to most other common indigenous and domesticated mammals (except cows and horses); and human bones are more likely to be intact, and tightly clustered in a small area (maximum of 1.5 m in diameter). Skulls and lower jaws are, of course, very distinctive, and in most cases are easily identified by the average person.

If human remains are suspected to be recent (i.e., non-archaeological), this is no longer an archaeological concern and the RCMP and forensic experts must be called to the site.

1. **STOP ALL LAND-ALTERING WORK** within at least 50 meters of where the human remains were uncovered. If possible, stop *all* work within job site until an archaeologist has assessed the remains and discussions have been made with local First Nation agencies.

2. **REPORT TO MANAGEMENT AND ARCHAEOLOGIST.** Immediately contact the site superintendent, and phone the consulting archaeologist who will get in touch with relevant First Nation agencies, clients, the Archaeology Branch, and RCMP if necessary. Contact information is presented on page 3.

3. **DO NOT DISTURB THE REMAINS.** Do not remove or handle any of the suspected remains, surrounding sediments, or previously removed backfill. Restrict access to the find.

Once these steps have been completed, the archaeological consultant and local First Nation representatives will visit and closely inspect the suspected ancestral remains. ***The Archaeology Branch will be notified to discuss the situation and further management and required permitting for the encounter. Formulation and implementing appropriate management strategies will depend greatly on a combination of local First Nation Ancestral Remains Policies, and the BC Archaeology Branch's Found Human Remains Policy.*** Due to the sensitivity and detailed management procedures associated with Ancestral Remains, schedule and funding extensions should be anticipated.

5.0 ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCES IN B.C.

An archaeological site is defined by the B.C. Archaeology Branch as "…the physical evidence of how and where people lived in the past" (https://www2.gov.bc.ca). There are over 50,000 known archaeological sites in B.C., with more newly recorded every year. Many people assume these sites can only be found in the remote and untouched areas of B.C. However, cultural materials have been found almost everywhere. Sites have been frequently recorded under highways, under industrial buildings and even in the backyards of typical suburban residences, albeit in a disturbed state. Most sites are located in raised and well-drained localities near sources of water, notably along rivers and beside lakes and streams. Some sites are small, being only about 2 m in diameter, and village sites can extend for several kilometers along the Fraser River.

All archaeological sites predating 1846 are automatically protected by the **Heritage Conservation Act** (see Section 8.0). Disturbance and investigation of archaeological sites must be carried out under the appropriate Archaeology Branch and local First Nation permits. Permit applications are usually completed by archaeological consultants on behalf of their clients.

Figure 3. Significant archaeological village site deposits (dark soil) found under a deconstructed industrial building in Maple Ridge (Photo Credit: Antiquus, 2000).

6.0 TYPICAL ARCHAEOLOGICAL SITE TYPES AND CULTURAL MATERIALS IN SOUTHWEST B.C.

The following section will serve as a reference guide, briefly outlining several common types of archaeological sites and cultural materials that ***may*** be exposed during your company's land-altering activities.

(1) Isolated, scattered and clustered buried lithics and artifacts such as lithic (stone) tools, lithic waste flake scatters, found either as isolated artifact finds or as low to high density scatters of lithic tools or lithic waste flakes (the by-product of lithic tool production) may be encountered and exposed during land-altering activities. Typical lithic material types found at sites in this area includes siliceous metasediments, cherts, basalt, dacite, andesite, quartzite and other similar types of material.

Figure 4. Some of the more obvious artifacts that may be seen during disturbances are projectile points. Used as spears, knives, or perforators, they are an interesting find and quite recognizable. They are important tools in dating archaeological sites because projectile points changed in design throughout the years.

Figure 5. Sometimes archaeological lithics can look like gravel crush. These bipolar core fragments often look like rocks you might see on the side of the road. To the discerning eye, the specific crushing and flaking is indicative of intentional flake and tool production.

Figure 6. Complete and fragmented bone and antler harpoon points. Rare, but significant finds. Usually found beside bodies of water as they were used as fishing tools.

Figure 7. Additional examples of utilized flakes and chipped stone tools that may be encountered during ground excavations. A good indication that you are looking at a lithic or a waste flake is if you notice sharp, chipped edges, and ripples (from impact of hammer stone) along the bottom (ventral) side of the stone flake.

Figure 8. Examples of larger ground stone tools. If you notice a cobble with obvious battering on one or more sides, or evidence of grinding and rounding along the sides, this may in fact be a tool.

(2) Buried archaeological "features" (e.g., dark-stained mottled and lensed soils containing artifacts and other cultural materials, hearths and fire-pits, food storage and processing pits, dwelling foundations and floor deposits, scatters of fire-altered rock, etc.) that become exposed in the stratigraphy during the course of machine activities. These features are often conspicuous by their "non-natural" appearance, and association with dark-stained organic-rich soil horizons, lithic artifacts and faunal remains.

Figure 9. Archaeological features such as hearths or house floors, are evident in the stratigraphy (Antiquus 2000).

(3) Culturally Modified Trees:

"A CMT *is a tree that has been altered by aboriginal people as a part of their traditional use of the forest. There are many kinds of CMTs in British Columbia. Examples include trees with bark removed, stumps and felled logs, trees tested for soundness, trees chopped for a pitch, etc."* – CMT Handbook, 2001

Archaeological CMTs are old-growth trees that have bark or planks stripped away. CMTs also originate from post-contact, historic sources. Dendrochronological techniques can be used to find out the exact date the bark was stripped from the tree. The tree will automatically be protected by the Heritage Conservation act if it dates to, or before, 1846.

Figure 10. Example of a CMT. (Antiquus 2020)

7.0 REPORTING

When archaeological deposits are encountered during development and an appropriate management plan has been formulated, discussed and undertaken, the consulting archaeologist is responsible for recording all related information and producing a report on the cultural materials uncovered during land-altering activities. Once completed, the consulting archaeologist will submit copies to all stakeholders and may recommend further management actions and any additional required permits.

8.0 LEGISLATION

The Heritage Conservation Act (HCA) legally protects all sites that predate 1846 on private and Crown Lands. ***As of March 2019, people are legally required to report discoveries of specified sites of objects with potential heritage value.*** Enforcement and Compliance may be called if archaeological sites are knowingly disturbed or vandalized. Additional information concerning legislation and archaeological resources is provided in the link below:

https://www.bclaws.ca/civix/document/id/complete/statreg/96187_01

It is important for all development companies attempt to read and understand this legislation if they perform any type of ground alterations within a known site or area deemed to have medium or greater archaeological site potential.

9.0 REFERENCES

Archaeology Branch (1999). Found Human Remains. On file with the Archaeology Branch, Victoria, B.C. From http://www.tca.gov.bc.ca/archaeology/policies/found_human_remains.htm

Archaeology Branch (2010). Heritage Conservation Act (RSBC 1996). On file with the Ministry of Tourism, Culture, and the Arts, Victoria, BC. From http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96187 _01 BCAPA (BC Association of Professional Archaeologists) (2010). Archaeology in British Columbia. From http://www.bcapca.bc.ca/archaeology.htm

Tsleil-Waututh Nation Archaeological Chance Finds Management Guideline
2020 Tsleil-Waututh Nation

Appendix E -

Geotechnical Investigation Reports

Geotechnical Investigation Reports

CEDAR DRIVE UPGRADES - SANITARY PUMP STATION TO GILLEYS TRAIL

CONTRACT 81832 – PHASE 2

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Geotechnical Report ..... GEO 8 to GEO 43

275 – 3001 Wayburne Drive
Burnaby, BC V5G 4W3 Canada
T: 604.874.1245 • www.exp.com

Memorandum

Date:	March 31, 2025	**Reference No.:**	VAN-00260722-A0
To: **Company:** **Email:**	Carl Bruggeman, AScT., Manager ISL Engineering and Land Services Ltd. cbruggeman@islengineering.com	**Total No. of Pages:**	1 + Attachments
Prepared By/Email:	Rajesh Manandhar, P.Eng.	rajesh.manandhar@exp.com	
Project Name:	Cedar Drive Relocation Project		
Subject:	Testhole and Standpipe Piezometer Installation		
Distribution/Email:	Nadeem Kazmi	NKazmi@coquitlam.ca	

At the request of the City of Coquitlam, EXP Services Inc. conducted the drilling of three test holes, each extending to a depth of 3 meters from the existing grade. The drilling operations were performed using a subcontracted truck-mounted drill rig, with a solid stem auger employed to advance the test holes. Standpipe piezometers were installed in two of the three test holes, with two standpipe piezometers nested at one location. The approximate locations of the test holes are depicted in the attached figure. The water level measurements obtained are recorded in the attached test hole logs.

We trust this fulfills your current requirements. If you have any questions, please do not hesitate to contact us.

Submitted by:
EXP Services Inc.

Rajesh Manandhar, M.Sc., P.Eng.
Senior Geotechnical Engineer

Attachments:

- Interpretation & Use Study of Report
- Figure 1 - Approximate Testhole Location
- Testhole Logs (AH25-01 through AH25-03)

E:\VAN\VAN-00260722-A0\60 Execution\66 Construction Admin\Fied Memo\EXP ME_2025 03 31 Piezometer Installation, Cedar Dr, Coquitlam.docx

INTERPRETATION & USE OF STUDY AND REPORT

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental consulting unless specifically stated in the engineering report.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

a. Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b. Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

c. To avoid misunderstandings, EXP Services Inc. (EXP) should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by EXP. Further, EXP should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with EXP's recommendations. Any reduction from the level of services normally recommended will result in EXP providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When EXP submits both electronic file and hard copies of reports, drawings and other documents and deliverables (EXP's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EXP shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EXP shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EXP's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EXP. The Client warrants that EXP's instruments of professional service will be used only and exactly as submitted by EXP.

The Client recognizes and agrees that electronic files submitted by EXP have been prepared and submitted using specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

exp Services Inc.
275–3001 Wayburne Drive
Burnaby, BC V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
www.exp.com

DFTR.	REVISIONS		
AG	No.	DESCRIPTION	DATE
DSGN.	0	ISSUED FOR PERMITTING	2025-03-10
RM			
CHK.			
RM			

CLIENT: ISL ENGINEERING AND LAND SERVICES LTD.

PROJECT: CEDAR DRIVE RELOCATION
COQUITLAM, BC

PROJECT NO.: VAN-00260722-A0

TITLE: Approximate Testhole Location

DATE	SCALE:	DWG NO.
2025-03-10	1:2,500	Figure 1

\\exp\data\VAN\VAN-00260722-A0\50 Input\51 Internal\Permits-Planning\2025-03-18 Drilling Program-Permits\Attachments\VAN-00260722-A0 Proposed TH Location Plan 2025-03-10 v0 AG.dwg
Mar 13, 2025 - 8:22pm

EXP Services, Inc.
48 Quarry Park Boulevard S.E. Calgary,
Calgary, AB T2C 5P2
Telephone: 1 4035093030

RECORD OF AUGERHOLE : AH25-01

PROJECT NUMBER VAN-00260722-A0
CLIENT City of Coquitlam
PROJECT NAME Cedar Drive Relocation
PROJECT LOCATION Cedar Drive, Coquitlam, BC
DRILLING DATE 2025-03-18
AUGERHOLE LOCATION ZONE: 10 N: 5461834.941 E: 520324.5735
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
ELEVATION 3.00m Geodetic (approximate)
DRILLING METHOD Solid Stem Auger
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 1.4m
▼ **AT END OF DRILLING** 0.99m
▼ **AFTER DRILLING** --- 3/21/2025 Borehole was under ponding water
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY AG **CHECKED BY** RM

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	RECOVERY %	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m	POCKET PEN. (kPa) / FIELD VANE SHEAR (kPa)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT	WELL DIAGRAM
		(FILL) SAND and GRAVEL, trace silt, grey, sand is medium to coarse grained, gravel is fine to medium-grained. - Gravel size increases with depth		S01	GB					Flush Mount with Concrete Seal
1		SANDY SILT, some black organics, trace gravel, brown	2.09 / 0.91	S02	GB					Bentonite
		SILTY SAND, some fine-grained gravel, trace pieces of wood, dark brown, sand is medium-grained	1.48 / 1.52	S03	GB					Filter Pack
2		ORGANIC SILT, black	1.02 / 1.98	S04	GB					Bentonite
		SILT, trace fine-grained sand, brown - trace rootlets at 2.3m - interbedded silty medium to coarse-grained SAND at 2.6m - becomes grey at 2.6m	0.71 / 2.29	S05	GB					Slotted Pipe
3			-0.05	S06	GB					
				S07	GB					

Bottom of hole at 3.0m.

EXP Services, Inc.
48 Quarry Park Boulevard S.E. Calgary,
Calgary, AB T2C 5P2
Telephone: 1 4035093030

RECORD OF AUGERHOLE : AH25-02

PROJECT NUMBER VAN-00260722-A0
CLIENT City of Coquitlam
PROJECT NAME Cedar Drive Relocation
PROJECT LOCATION Cedar Drive, Coquitlam, BC
DRILLING DATE 2025-03-18
AUGERHOLE LOCATION ZONE: 10 N: 5462239.938 E: 520592.7688
DRILLING CONTRACTOR Downrite Drilling Ltd.
ELEVATION 3.00m Geodetic (approximate)
DRILLING METHOD Solid Stem Auger
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 2.4m
EQUIPMENT TYPE Track Mounted Auger Drill Rig
▼ **AT END OF DRILLING** ---
LOGGED BY AG **CHECKED BY** RM
▽ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		(FILL) SAND & GRAVEL, some silt, brownish grey, sand is medium to coarse-grained, gravel is fine to medium-grained - 0m to 0.3m trace rootlet		S08	GB				
			2.39						
1		SILT, trace to some sand, trace gravel, trace pieces of wood, trace black organics, dark brown	0.61						
			1.93	S09	GB				
		SILTY SAND, trace pieces of wood, trace black organics, dark brown, sand is medium to coarse-grained	1.07						
				S10	GB				
			1.48						
		SILT, some pieces of wood and rootlet, reddish brown	1.52						
2				S11	GB				
				S12	GB				
		▽	0.50						
		SILT, trace sand, grey	2.50						
				S13	GB				
3			-0.05						

Bottom of hole at 3.0m.

EXP Services, Inc.
48 Quarry Park Boulevard S.E. Calgary,
Calgary, AB T2C 5P2
Telephone: 1 4035093030

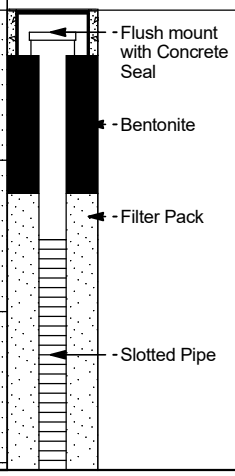
RECORD OF AUGERHOLE : AH25-03

PROJECT NUMBER VAN-00260722-A0
CLIENT City of Coquitlam
PROJECT NAME Cedar Drive Relocation
PROJECT LOCATION Cedar Drive, Coquitlam, BC
DRILLING DATE 2025-03-18
AUGERHOLE LOCATION ZONE: 10 N: 5462298.641 E: 520651.0018
DRILLING CONTRACTOR Downrite Drilling Ltd.
ELEVATION 4.00m Geodetic (approximate)
DRILLING METHOD Solid Stem Auger
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 0.9m
EQUIPMENT TYPE Track Mounted Auger Drill Rig
▼ **AT END OF DRILLING** 0.76m
LOGGED BY AG **CHECKED BY** RM
▽ **AFTER DRILLING** 0.4m 3/21/2025

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	RECOVERY %
1		(FILL) SAND & GRAVEL, trace to some silt, brownish grey, sand is medium to coarse-grained, gravel is fine to medium-grained		S14	GB	
			2.93	S15	GB	
		SILT, some fine to medium-grained sand, some pieces of wood, trace black organics, dark brown	1.07			
		- becomes SILT, trace sand, trace pieces of wood, brown	2.42	S16	GB	
2		SAND, trace to some silt, trace black organics, brown, sand is medium-grained	1.58	S17	GB	
		SILT, some rootlet, some dark brown organics, reddish brown	1.87			
		- becomes dark brown at 2.6m	2.13	S18	GB	
3				S19	GB	
			0.95			

SPT N VALUE BLOWS/0.3m (▲) 20 40 60 80
DYNAMIC CONE BLOWS/0.3m (▨) 20 40 60 80
POCKET PEN. (kPa) (⊙) 100 200 300 400
FIELD VANE SHEAR (kPa) Peak (●) Remold (○) 40 80 120 160
FINES CONTENT (%) (□) 20 40 60 80
PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80

WELL DIAGRAM
Casing Type:



Bottom of hole at 3.0m.

January 22, 2021

ISL Engineering and Land Services Ltd.
#503 – 4190 Lougheed Hwy.
Burnaby, BC V5C 6A8
Email: cbruggeman@islengineering.com

Attention: Carl Bruggeman, AScT., Manager, Municipal Transportation

Re: EXP Reference No: VAN-00260722
Detailed Design Phase Geotechnical Services
Cedar Drive Relocation Project
Coquitlam, BC

Dear Mr. Bruggeman:

1.0 INTRODUCTION

EXP Services Inc. ("EXP") was retained by ISL Engineering and Land Services Ltd. ("ISL") to prepare a geotechnical engineering assessment letter report ("report") to summarize the results of additional subsurface exploration works and to present findings and recommendations to supplement the findings of two prior EXP geotechnical reports for works along the proposed road alignment of Cedar Drive in Coquitlam, BC (the "City").

The scope of this work covers the proposed road alignment between approximate Stations 0+600 and 1+640 (Gilley Road). The proposed road west of Station 0+600 will be part of a future project and is not included in this present scope.

EXP's current scope of services was carried out in accordance with EXP's Proposal No. 999-00072491-PP dated June 25, 2020 and was intended to provide additional information for the detailed design phase. The scope of services does not include assessment of the soil or groundwater conditions at the project site with respect to environmental contaminant considerations. No formal seismic analysis, liquefaction analysis or post-disaster seismic analysis was carried out, as it was understood that the City has no seismic requirements for the proposed pump station.

2.0 BACKGROUND SOURCES OF INFORMATION

As part of the preliminary design phase of the C*edar Drive Relocation and Environmental Enhancement* project, EXP previously completed two geotechnical reports. These include:

- EXP's geotechnical report of June 28, 2012 involved a geotechnical assessment of subsurface conditions (4 test pits of varying depths of 2.1 to 4.4m below existing ground surface) along the proposed Cedar Drive preliminary design alignment (STA 0+800 to Gilley's Trail) and provided

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geotechnical recommendations pertaining to the subgrade preparation and new road pavement design.

- EXP's July 17, 2015 report provided geotechnical analysis for the purpose of selecting an optimum site treatment option (Preloading vs. Over-excavation) for the proposed road relocation.

3.0 PROJECT DETAILS

The proposed new road alignment is located approximately parallel to the existing Cedar Drive roadway. A large embankment, approximately up to 3.6m in height, would be constructed across the existing agricultural land.

It was proposed to construct a new, grade supported, gravity sanitary sewer along the approximate centerline of the new road embankment. It was understood that this sewer line was proposed/designed with a very low gradient of 0.5%. As a result, settlement is not considered tolerable.

A pump station would be constructed at the south end of the sanitary sewer.

4.0 FIELD EXPLORATION

Prior to drilling, proposed test hole locations were cleared by a utility locate service, Quadra Utility Locating Ltd.

Drilling was conducted on October 15, 2020 and consisted of seven (7) auger testholes, designated as AH20-01 to AH20-07, using a truck-mounted auger drill supplied by Southland Drilling Co. Ltd. Drilling depths ranged from 7.3m to 25.6m below ground surface. The drilling was supervised by a geotechnical technician from EXP, who logged and sampled the testholes. Grab samples were taken from the auger flights, sealed into plastic sample bags, and returned to the EXP laboratory for moisture content determination. Moisture content results are presented on the logs.

In addition to the auger drilling, Dynamic Cone Penetration Testing (DCPT) was carried out at the same drill hole location prior to auger drilling. This consists of driving a standardized 64mm metal cone into the soil, using an automatic trip hammer with 63.5 Kilogram weight and 0.76m drop height. DCPT "blow counts", the number of blows for each 300mm of penetration, is generally considered equivalent to SPT N values for tests within 10m to 15m depth (Canadian Foundation Engineering Manual, 4th Edition, 2006). The DCPT results are plotted on the auger hole logs. The DCPT data was utilized for interpretation of soil density/consistency at the testhole location and for geotechnical analyses.

The auger holes and DCPTs were backfilled with soil cuttings and bentonite in accordance with groundwater protection regulations.

The auger hole logs are attached to this report. Testhole locations including test pit locations conducted in year 2012 are shown on the Testhole Location Plan, Figure 1, attached to this report.

A sieve analysis was carried out on a sample taken at depth in AH20-01; Sieve Report No. 1 is attached to this report.

5.0 SUBSURFACE CONDITIONS

The following Table 1 provides a simplified soil profile was encountered in the test holes.

Table 1: Simplified Soil Profile Encountered in 2020 Test Holes

Unit Number	Soil Type	Soil Description	Thickness of layer (m)	Depth to top of layer (m), measured from ground surface
1	FILL	Mixed fills.	0.6 to3.0	At surface.
2	PEAT/ORGANIC SOILS	Peat and organic silt. Highly compressible.	0.8 to 1.8	0.6 to 3.0
3	SOFT SILT	Loose to compact	2.8 to greater than23.2	0.6 to 3.8
4	DENSE TILL-LIKE MATERIALS	Hard/compact to dense to very dense	0 to greater than0.3	5.5 to greater than 25.6

Groundwater was encountered at 0.9 to 2.9m below grade in the auger holes at the time of drilling. These observations may be misleading, as groundwater levels may not have had enough time to stabilize. Generally, groundwater would be expected to be near the grade of the original native surface. Groundwater conditions are expected to vary with time of year, recent rainfall, stream flow and river flow conditions.

It is important to note that the soil and groundwater conditions described above were encountered in the specific testholes and are representative of the soil conditions in the immediate vicinity of each testhole. Interpretation of the soil profile at the site is formulated on the basis of an assumed continuity of subsurface conditions at the site. Therefore, the soil units described above are generalized and based on the available testhole information only.

6.0 ROAD EMBANKMENT RECOMMENDATIONS

6.1 Settlement Estimates

The following Table 2 summarizes settlement predictions at individual test hole locations. This is based on Embankment Fill constructed with an additional 2m thick surcharge on top. Owing to the height lost to settlement, the achieved effective surcharge will be less, ranging from 600 to 950mm thick. A higher achieved surcharge could be considered. Settlements are caused both by the surface peat layer and the deep soft silt layer (In the order of 25m deep).

Table 2: Summary of Settlement Estimates

Summary of Settlement Estimates				
Testhole	**Embankment Height (m)**	**Surcharge Height (m)**	**Long term settlement (mm)**	**Achieved Effective Surcharge (to be removed) (mm)**
AH20-01	2 m	2 m	1250	750 mm
AH20-02	3.2 m	2 m	1300	700 mm
AH20-03	3.2 m	2 m	1400	600 mm
AH20-04	3.5 m	2 m	1200	800 mm
AH20-05	3.5 m	2 m	1200	800 mm
AH20-06, AH20-07	2.0	2 m	1050	950m

The following Table 3 summarizes findings and comments on settlement.

Table3: Summary of Settlement Findings & Comments

Issues	Embankment Fill + 2m Surcharge
Initial Settlement	500mm to 1200mm, over a period of 12 to 18 months. Margin of error is -50% to +100% range for settlement. This settlement will be variable and non-uniform.
Long-Term Settlement	50mm to 200mm, over 30 years. Margin of error is -50% to +100% range for settlement. This settlement will be variable and non-uniform.
Time Delay before Construction	Requires about 12 to 18 months following embankment and surcharge construction. Margin of error is -50% to +100% range for settlement.
Other Cost Items	Requires extra 2m of surcharge fill. Requires extra fill height to compensate for the settlement of up to about 2m range.
Risks during construction	If loaded rapidly, ground failure can occur. Staging is recommended. Without staging, may need geogrids to maintain ground stability, subject to slope stability assessment.
Long-Term Risks	Higher risk of differential settlements. This can impact the operations of the gravity services.
Remedial Options, if needed.	Settlement estimates may be better assessed when surcharge data become available. If differentials are much higher than expected, the following options can be considered: • Prolong the surcharge period (most realistic), • additional surcharge fill can be added to reduce post-construction settlement, • additional surcharge fill can be added to reduce post-construction settlement, • use light weight fill to reduce the loading and, hence, reduced long term settlement.

The expected range of post-construction settlement (50 to 200mm) is not expected to have significant impacts on the operation and structural integrity of the road; but may interrupt the normal operations of gravity service lines, including storm sewers. It would be desirable to allow for steep gradients. Long-term maintenance or perhaps repairs may be required.

6.2 Comments on Sewer Construction Difficulties and Alternatives

EXP's earlier exploration and analysis was based on a relatively shallow test pit exploration. It was hoped that by preloading, possibly combined with over-excavation of surface peat, it would be possible to reduce post-construction settlements of the embankment and sewer line to minimal amounts. Based on the deep drill hole information, this is not considered possible now, as significant post-construction settlements are expected.

Constructing the sewer line on piled foundations is problematic. The piles would have to be very deep (in excess of 25m in some areas) and founded in dense till deposits to avoid settlement of the piles (Note that friction piles founded in the soft silt are expected to settle). If the sewer line was piled successfully, no settlement of the line would be expected. However, the road embankment would settle downward around the line. The sewer trench-line would be expected to erupt out of the road surface. Regular patching and repair of the trench surface, and adjustment of manhole cover elevations would be expected over time.

Note also that trenching of the sewer line would be difficult. It would be preferred to construct the sewer line after the embankment has been placed and settled substantially. Trenching from the top of the embankment would then be 4 or 5m deep.

The use of lightweight trench backfill would not significantly reduce settlements and would be very expensive.

Over excavation of surface peat could be considered. However, this would be expensive due to the depth (up to several meters) and would not be a substantial gain since settlement from the soft soils at depth would still be large.

6.3 Alternative Sewer Alignment on Old Roadway

Based on the above, from a geotechnical viewpoint it is considered more practical to relocate the proposed sewer line back to the old road alignment. The soft soil deposits should be much thinner here and possibly non-existent, due to the location at the edge of the floodplain deposit, where soft soils should be pinching out. The road embankment along the old alignment would have been in place in excess of 75 years, based on the age of Minnekhada Lodge that is serviced by this road. Primary consolidation and a significant part of secondary consolidation should be complete. Therefore, it is expected that any on-going settlement would be small.

The above issues were discussed with the ISL and City of Coquitlam, and it was decided to move the proposed sewer line on to the existing Cedar Drive road. The proposed alignment of the sanitary sewer is shown on the updated drawing prepared by ISL attached with this report.

Please note that part of the proposed sewer line remains on the new Cedar Drive alignment. This section is located between approximate Stations 1+415 and 1+520 in the new embankment alignment, and is subject to the large settlements as discussed in Sections 5.1 to 5.3 (in excess of 1m).

Note also that part of the old Cedar Road alignment, and the existing Gilleys Trail, is proposed to be raised, with approximately 1m of fill. Settlement calculations have not been carried out, but settlements could be significant. Surcharging this area may not be realistic, since the road needs to remain open to traffic. It may be necessary to leave the new roadway as a temporary gravel roadway during the settlement period.

6.4 Subgrade Preparation for Embankment + Surcharge Option

Over-excavation of surface peat is not required.

Stripping should include removal of trees, brush and vegetation. In general, the surface root mat should be left intact to improve stability of the embankment. Small trees should be cut flush to the ground. If this is not possible for large tree stumps, the stumps may be grubbed, but a layer of biaxial geogrid should be laid over the former stump location to improve stability.

6.5 Embankment Fill, Placement, Geometry

Embankment Fill may be constructed from free-draining granular soils, such as 75mm minus pit-run sand and gravel or river sand with less than 5% fines content (particles passing the 0.075mm sieve size).

Embankment Fill may also be constructed of lower quality Till Fill, with a Granular Fill Cap. This consists of glacial deposits, typically taken from building excavation spoil. The silt content is typically 15% to 30%, and so this material is highly moisture sensitive. It can normally only be compacted in dry summer weather conditions. The supply of Till Fill is variable, as it depends upon building excavation work. Due to the volume of the material required, it may be difficult to source enough material all at once, when desired. Siltation erosion problems will need to be contained with silt fencing and clean up may be difficult.

Embankment Fill that is constructed of Till Fill also requires the following:

- A Drainage layer beneath the Till Fill at the base of the embankment, 0.5m thick. This should consist of free-draining granular soils, such as 75mm minus pit-run sand and gravel or river sand with less than 5% fines content (particles passing the 0.075mm sieve size). The purpose of this Drainage layer is to allow water to drain out of the native soil subgrade, which occurs as the soil is compressed and consolidates.
- The Till Fill should be covered with a 1.0m Granular Fill Cap (this cap would include the pavement section). The Granular Fill Cap should be constructed of free-draining granular soils, such as 75mm minus pit-run sand and gravel or river sand with less than 5% fines content (particles passing the 0.075mm sieve size).

The Embankment Fill should be placed in maximum 300mm thick loose lifts with each lift compacted to

at least 95% Modified Proctor maximum dry density ("MPMDD") for the upper 1m of the final embankment. Below this 1m depth, the embankment should be compacted to at least 90% MPMDD. Field density tests should be conducted to confirm that compaction of Embankment fill meets the specification.

Permanent side slopes for Embankment Fill should be no steeper than 2H:1V.

6.6 Surcharge Fill, Placement, Geometry

Due to the large settlements of (1050 to 1400mm), most of the Surcharge Fill will settle down below top of Embankment and be left in place after the preloading period. This means that the Surcharge Fill will form the top of the final Embankment Fill. As a 1m thick Granular Fill cap is required on top of the Embankment, Surcharge Fill should be constructed from free-draining granular soils.

The use of Till Fill as Surcharge Fill is not recommended for several reasons:

- If Till Fill is used as Surcharge Fill, it would have to be removed from the upper 1m of the embankment and replaced with Granular Fill.
- If Surcharge Fill is constructed from Till Fill, there would typically be disposal fees, including dump fees, to get rid of the Till Fill at the end of the preload fill. This disposal fee can be significant and can cost as much as buying Granular Fill. Granular fill can normally be re-used easily, and disposal is straightforward.

The Surcharge Fill should be placed in maximum 300mm thick loose lifts with each lift compacted to at least 95% MPMDD for the full depth of Surcharge Fill. Density tests should be conducted to confirm that compaction of Surcharge fill meets the specification.

Temporary side slopes for surcharge fill should be designed at 1.5H:1V (Horizontal:Vertical). The crest of the surcharge fill may match the embankment fill crest.

6.7 Staging

Due to ground stability concerns, the embankment fill and preload fill should be placed in 2 to 3 stages, with each stage separated by about least 3 weeks.

6.8 Required Instrumentation

Settlement gauges should be installed approximately at the centre and near the crest of the preload at 50m intervals along the road alignment. The settlement gauge typically consists of 25mm diameter steel pipe with 0.6m by 0.6m plywood attached at the bottom. These gauges should be installed on top of the prepared subgrade before placing any fill. There should be provisions to extend the pipes of the settlement gauges as fill height increases.

Base line readings should be taken for prior to placement of any fill. Thereafter, settlement gauge readings should be taken weekly during embankment construction, and every 2 weeks for the first month after completion of the embankment construction, and then every 4 weeks until preloading is removed.

Interpretation of the monitoring data would be done by the Geotechnical Engineer to assess preload time. The time of preload removal would depend on the long-term settlement tolerance of the road embankment and any utilities.

6.9 Trench Excavations

The sidewalls of unsupported trench excavations should generally be cut no steeper than 1H:1V for trench stability and worker safety purposes. A Geotechnical Engineer should periodically review the soils encountered during excavation and make recommendations as warranted.

It is possible that saturated granular fills, such as fine sands, flow into the trench excavation, resulting in the need for flatter side slopes, or for dewatering of slopes.

Trench shoring cages may also be considered for trenching.

Groundwater seepage should be expected within the trench excavations, below the water table. Dewatering should be completed as necessary to allow pipe installation and backfill placement to occur in dry conditions. Based on the soil conditions encountered and local experience, it is expected that conventional sump pumping methods would generally be sufficient to handle possible seepage volumes. It is possible that vacuum point dewatering may be needed in localized areas, for example, where saturated sands have been exposed below the water table. However, the dewatering method used would need to be selected in response to actual groundwater conditions encountered during construction. The design, operation, and maintenance of a dewatering system should be the responsibility of the contractor.

6.10 Trench Backfill

Trench backfill placed above the pipe zone and up to the underside of the pavement restoration should be as specified in MMCD Standard Detail Drawing Number G4 for utility trenches. For utility trenches within roadways, this requires imported granular backfill compacted to at least 95% MPMDD.

Imported granular backfill should be comprised of free draining, well graded sand and gravel meeting gradation specifications for either “Pit Run Gravel” or “Select Granular Subbase” per MMCD Section 31 05 17 Items 2.3 and 2.8, respectively.

In general, the existing surface mixed fills and native soils are generally considered unsuitable for reuse as granular backfill supporting road or sidewalk areas.

If the embankment is constructed of Till Fill, it will not be suitable for re-use as trench backfill.

Embankment fill consisting of free-draining sand and gravel meeting MMCD specifications could be side cast and re-used as trench backfill.

The granular backfill should be placed in lifts having a thickness of no more than 300mm and each lift should be compacted to achieve at least 95% MPMDD. Compaction of on-site soil used in landscape only areas should be compacted to approximately 90% MPMDD. Field density tests should be conducted to verify that the specified compaction is achieved.

7.0 PUMP STATION RECOMMENDATIONS

Dense till-like materials were inferred to occur in AH20-06 below a depth of 6.7m. Pump station foundations should be supported on this layer. It is expected that a wet well supported on a raft foundation directly on the dense till-like materials, or piled foundations driven into dense till-like materials, should be feasible.

No formal seismic analysis, liquefaction analysis or post disaster seismic analysis was carried out as it was understood that the City has no seismic requirements for the proposed pump station.

8.0 PAVEMENT STRUCTURE RECOMMENDATIONS

The new Cedar Drive is expected to function as an arterial to service significant future development in the general area. The minimum pavement structure on top of the fill embankment is recommended below, and is intended for a compacted granular fill subgrade or dense Till Fill subgrade, compacted to 95% MPMDD:

Material	Recommended Minimum Thickness
Asphaltic concrete surface (Hot Mix Asphalt, HMA)	125 mm
19 mm minus Granular Base	150 mm
75mm Crushed Granular Sub-base	300 mm

Road construction materials should be in compliance with the Master Municipal Construction Documents (MMCD), and both the base and sub-base should be compacted to at least 95% Modified Proctor maximum dry density.

The 125mm Hot Mix Asphalt surfacing should be placed in two lifts, using a 75mm thick Lower Course #1 mix for the bottom lift, and a 50 mm thick Upper Course #1 mix for the upper lift. A tack coat should be applied between the lifts as per MMCD.

As previously discussed, some post-construction settlement in the order of 50 to 200mm is expected to occur, and the final lift of asphalt pavement application should be delayed as long as is practical to avoid undesirable settlement induced distress on the final road pavement.

9.0 CLOSURE

Please be advised that the contents of this report are based on information provided to EXP by others and our understanding of the proposed development as described in this report. If the development plans change or if during construction the soil conditions are noted to be different than those described in this report, EXP should be notified promptly and the recommendations on the geotechnical aspects of the proposed development reviewed and adjusted accordingly.

Also note that this report was prepared for the exclusive use of our client, ISL Engineering and Land

Services Ltd., the City of Coquitlam, and their designated consultants and agents, and may not be used by other parties without written consent of EXP Services Inc. The attached "Interpretation & Use of Study and Report" forms an integral part of this report and must be included with any copies of this report.

Contractors should make their own assessment of subsurface conditions and select the construction means and methods most appropriate to the site conditions. This geotechnical report should not be included in contract specifications without suitable qualifications and prior review by EXP.

If you have any questions regarding the contents of this report, please call the undersigned.

Sincerely,

EXP Services Inc.

Walt Dengler, P. Eng.
Senior Geotechnical Engineer

Rajesh Manandhar, P. Eng.
Geotechnical Engineer

Attachments: Interpretation & Use Study of Report
Testhole Location Plan – Figure 1
Test Hole Logs (AH20-01 to AH20-07)
Sieve Analysis Report No. 1
ISL Civil Drawings Design No. 32628, Rev. D, Dwg. Nos. 1, 2, 5, 6, 7, 8, and 9

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INTERPRETATION & USE OF STUDY AND REPORT

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental consulting unless specifically stated in the engineering report.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

a. Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b. Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

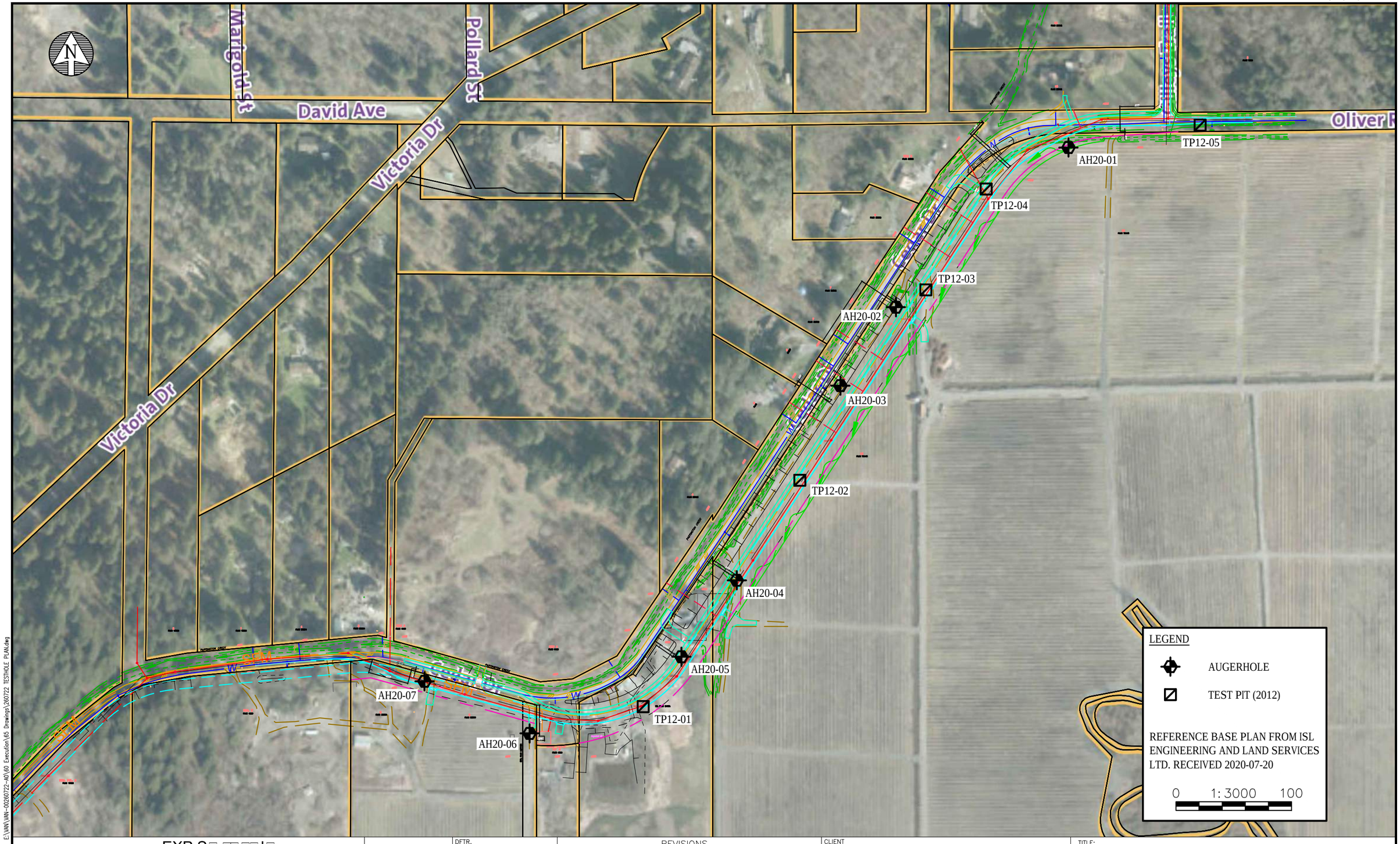
c. To avoid misunderstandings, EXP Services Inc. (EXP) should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by EXP. Further, EXP should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with EXP's recommendations. Any reduction from the level of services normally recommended will result in EXP providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When EXP submits both electronic file and hard copies of reports, drawings and other documents and deliverables (EXP's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EXP shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EXP shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EXP's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EXP. The Client warrants that EXP's instruments of professional service will be used only and exactly as submitted by EXP.

The Client recognizes and agrees that electronic files submitted by EXP have been prepared and submitted using specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.



EXP S□r□c□□ I□c.
275–3001 Wayburne Drive
Burnaby, British Columbia V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
exp.com

DFTR.	DSGN.	CHK.
MG	SM	RM

REVISIONS

No.	DESCRIPTION	DATE

CLIENT: ISL ENGINEERING AND LAND SERVICES LTD.

PROJECT: CEDAR ROAD RELOCATION
COQUITLAM, BC

PROJECT NO.: VAN-00260722-A0

TITLE: TESTHOLE LOCATION PLAN

DATE	SCALE:	DWG NO.
2020-11-18	1:3000	FIGURE 1

Nov 18, 2020 – 11:57am E:\VAN\VAN-00260722-A0\60 Execution\65 Drawings\260722 TESTHOLE PLAN.dwg

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Columbia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-01

PROJECT NUMBER VAN-00260722-A0 **CLIENT** ISL Engineering
PROJECT NAME Cedar Drive Expansion **PROJECT LOCATION** Cedar Drive, Coquitlam, BC
DRILLING DATE 2020-10-15 **AUGERHOLE LOCATION** ZONE: 10 N: 5460044.3 E: 520479.18
DRILLING CONTRACTOR Southland Drilling Co. Ltd. **ELEVATION** G.S
DRILLING METHOD Solid Stem Auger **GROUND WATER DEPTHS:** ▽ **AT TIME OF DRILLING** 2.7m Below Grade
EQUIPMENT TYPE Truck Mounted Auger Drill ▼ **AT END OF DRILLING** ---
LOGGED BY SM **CHECKED BY** RM/WD ▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		TOPSOIL and SILTY SAND & GRAVEL mixed, trace cobbles & boulders, some oxidation, moist, dark brown, (loose), [FILL]		AU-1	AU		4 3		39
1		ORGANIC SILT, trace organics (decayed wood & wood pieces), fine sand, moist, dark brown, (very soft)	0.6	AU-2	AU		0		109
		PEAT, fibrous to amorphous, moist wet, orange to black, (very soft)	1.2	AU-3	AU		0 0		360
2		ORGANIC SILT with medium to coarse sand lenses, organics (decayed wood, plant matter & wood pieces), moist to wet, dark brown, (very soft)	1.7				0 0		
				AU-4	AU		0		75
		SILTY SAND, trace to some gravel, trace organics (decayed wood & vegetation), medium to coarse sand, fine to medium gravel, rounded to subangular, wet, brownish-grey, (compact to loose) ▽	2.4	AU-5	AU		13 8		35
3		-From 2.4m to 3.0m, some gravel					2		
		Interlayers of silt, medium to coarse sand to gravelly silty sand, organic silt, mix of amorphous and fibrous peat					2 2		
4				AU-6	AU		2		73
		Interlayers of organic silt, silt, coarse sand, trace organics (seashell fragments, wood pieces and decayed wood), trace to some fine angular gravel, wet, dark brownish-grey, (very soft to firm)					2 2 1		
5				AU-7	AU		6 6		38
		SILT, trace clay, trace to some fine sand, trace to some organics (wood pieces & decayed wood), low to medium plastic, grey, wet, (firm to soft)	5.5	AU-8	AU		1 3		62
6							3 2 2		
7		Interlayers of silt, organic silt, organics (decayed wood, rootlets, plant matter & wood pieces), trace to some fine sand, moist to wet, darkbrownish-grey, (very soft to firm)		AU-9	AU		3 5		65
		-becomes Silt, trace clay, trace fine sand, trace organics (occasional tiny wood pieces), wet, grey		AU-10	AU		4 3		78
8									

(Continued Next Page)

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-01

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5460044.3 E: 520479.18
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 2.7m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
9		-A layer of Silty Sand, fine to medium sand SILT, trace clay, trace to some fine sand, trace to some organics (wood pieces & decayed wood), low to medium plastic, grey, wet, (firm to soft) *(continued)*		AU-11	AU		4 5 5		40
10		-Interlayers of Silt, lenses of corase sand, Organic silt, Silt and some Clay, Clayey Silt, Dark brown Silt and Sand to Sandy Silt, lense of volcanic ash at ~11.8m -becomes Silt, lenses of coarse sand and organic silt		AU-12	AU		3 3 4		67
11		-becomes Silt, some Clay to Clayey Silt, grey , wet		AU-13	AU		6 5 5		63
12		-lenses of coarse sand trace fine gravel -lenses of volcanic ash up to 12.5mm -becomes Silt and Sand to Sandy Silt, dark-brown		AU-14	AU		5 10 12		59
13		END OF AUGER HOLE; DCPT WILL CONTINUE	12.2				7 5 5 5		
14							4 5 5		
15							5 6 5		
16							6 5 6		
							6 6 7		

(Continued Next Page)

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-01

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5460044.3 E: 520479.18
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 2.7m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
17		END OF AUGER HOLE; DCPT WILL CONTINUE *(continued)*					7		
							7		
							7		
18							6		
							8		
							7		
19							8		
							8		
							7		
20							8		
							8		
							9		
21							8		
							9		
							10		
22							9		
							10		
							9		
23							9		
							9		
							10		
24							10		
							9		
							11		
25							9		
							9		

(Continued Next Page)

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-01

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5460044.3 E: 520479.18
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 2.7m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		END OF AUGER HOLE; DCPT WILL CONTINUE *(continued)*					10 11		

Bottom of hole at 25.6m.

NOTES: -End of Auger hole at 12.2m
-End of DCPT at 25.6m
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-02

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459907 E: 520330.51
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** ---
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		TOPSOIL mixed with SILTY SAND & GRAVEL, trace organics (rootlets & decayed plant matter and wood pieces), trace cobbles and boulders, fine sand, fine to coarse round to angular gravel, moist, dark brown, (compact), [FILL]		AU-1	AU		7 5		41
1		PEAT, amorphous, trace fine gravel, moist, black, (soft to very soft)	0.6	AU-2	AU		3 1		114
		ORGANIC SILT/PEAT, trace gravel, some sand to sandy with amorphous peat, organics (rootlets, plant matter, decayed wood & vegetation), fine sand, fine rounded gravel, dark brown, moist, (very soft)	1.5	AU-3	AU		1 1 0		107
2		SILTY SAND, trace gravel, trace to some organics (wood pieces & decayed wood), fine, rounded gravel, fine sand, moist, brown, (very soft)	2.0	AU-4	AU		2 3		46
		-Sand becomes coarser (~75mm), fine to medium	2.3	AU-5	AU		2 4		44
3		SILT, trace to some sand, trace clay, trace gravel, trace organics (wood pieces and decayed wood), fine sand, fine rounded to subrounded gravel, low to medium plastic, moist grey, (soft to firm)					2 2		
				AU-6	AU		4		56 41
4		From 4.0m to 4.3m, SILTY SAND, fine to medium sand, moist, grey, (soft to firm)		AU-7	AU		6 5 5		
5		-becomes trace sandy after ~5.2m		AU-8	AU		5 5 5 5		56
6							4 5 5 5		
7				AU-9	AU		5 6 5		84
8		-a layer of SILTY SAND, fine to medium sand, moist, grey -lens of volcanic ash					6		

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EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-02

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459907 E: 520330.51
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** ---
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
9		SILT, trace to some sand, trace clay, trace gravel, trace organics (wood pieces and decayed wood), fine sand, fine rounded to subrounded gravel, low to medium plastic, moist grey, (soft to firm) *(continued)*		AU-10	AU		5 6		51
		-wood chunks, wood debris, and decayed wood observed					5 5 6		
10				AU-11	AU		7		70
		-a seam of medium to coase (mostly coarse) sand with organics(decayed wood, wood pieces and seashell fragments)		AU-12	AU		7		49
		-A layer of Amorphous Peat, moist, black		AU-13	AU				132
		-becomes CLAY, trace some silt, trace fine sand, moist, grey highly plastic		AU-14	AU		10 17		40
11		-becames dense at approx. 11.2m and very dense at approx. 13.5m (Possible Till) -END OF AUGER HOLE; DCPT WILL CONTINUE	11.0				29 29 37		
12							46 42 40		
13							45 50 100+		

Bottom of hole at 13.7m.

Penetrated 7"
(Refusal to DCPT)

NOTES: -End of Auger hole at 11.2m
-End of DCPT at 13.7m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-03

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459838.37 E: 520281.92
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** ---
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** 2.9m 10/15/2020 Below Grade

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		SILTY SAND & GRAVEL, trace cobbles and boulders, fine to medium sand, fine to coarse gravel, rounded to subangular, moist, grey, (compact to loose), [FILL]		AU-1			17		28
				AU-2			8		17
		PEAT, Amorphous, occasional cobble, moist, black, (very soft)	0.6	AU-3			1		268
1		PEAT, Fibrous, wet, orange, (very soft)					1		7.1
				AU-4			0		104
		ORGANIC SILT, some sand, mixed with Peat, organics (rootlets), wet, dark brown, (very soft)	1.4	AU-5			0		
		SILT, trace sand, trace organics (wood pieces, wood Pieces & plant matter), fine sand, low to medium plastic, moist, grey, (very soft to firm)	1.7				3		
2				AU-6			2		45
							5		
	▼						3		
3		-becomes trace fine subangular gravel, organics (wood pieces and decayed wood)					2		
							2		
				AU-7			7		50
4							8		
							4		
							3		
5				AU-8			6		33
							5		
				AU-9			2		49
6							3		
							5		
							3		
7							2		
							4		
		-occasional organics (small pieces)					8		
8							12		
				AU-10			7		63

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EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-03

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459838.37 E: 520281.92
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** ---
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** 2.9m 10/15/2020 Below Grade

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m	POCKET PEN. (kPa) / FIELD VANE SHEAR (kPa) Peak Remold	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
9		SILT, trace sand, trace organics (wood pieces, wood Pieces & plant matter), fine sand, low to medium plastic, moist, grey, (very soft to firm) *(continued)* -becomes SANDY SILT, fine sand, grey, wet, (soft)		AU-11			4 4 3		27 67
10		SILT, trace to some sand, trace clay, trace medium to coarse gravel, rounded to subangular, medium to coarse sand, low to medium plastic, wet, grey, (firm to hard)	9.5	AU-12			4 6 12 37		50
11							19 25 39		
12		-becomes trace to some gravel, fine to coarse gravel, occasional organics (small wood pieces) -becomes some gravel, fine to coarse rounded to subangular, wet, grey		AU-13			24 8 13 13		37
13		SILTY SAND and GRAVEL, fine to coarse sand (mostly coarse), fine to coarse gravel, moist, light grey, (very dense), [TILL-LIKE]	12.5	AU-14 AU-15			52 Refusal to DCPT, penetrated 3"		23 11

Bottom of hole at 13.7m.

NOTES: -End of Auger hole at 13.7m
-End of DCPT at 12.8m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-04

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459669.98 E: 520192.33
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** --- Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		SILTY SAND and GRAVEL, 19mm minus roadbase, trace cobbles and boulders, damp, brown, fine to medium sand , fine to medium rounded to subangular gravel, (compact to loose), [FILL]		AU-1			25		9
		-Topsoil mixed with Organics Silt and Peat, organics (wood debris, wood pieces & rootlets), trace fine gravel		AU-2			6		90
		SILT, trace sand, trace organics (rootlets), low to medium plastic, fine sand, moist, brownish-orange, (firm to stiff)	0.6	AU-3			2		80
1		-becomes Sand and Silt, fine sand, moist, light brown		AU-4			2		15
				AU-5			10		77
							3		
2							6		
							6		
							6		
3							3		
		-lense of Silt, some sand to sandy silt, fine sand, wet, grey					3		
							6		
				AU-6			8		37
4							7		
							8		
							7		
5							9		
				AU-7			5		44
							5		
6							9		
							11		
							7		
							6		
7		-becomes more silt, trace to some sand, fine to coarse sand, trace organics (decayed wood, wood pieces), trace fine gravel, wet, grey		AU-8			15		24
							12		
		CLAY, some silt to silty, trace to some fine sand, moist, higly platic, greyish-green, (stiff to firm)	7.6				12		
8							12		

(Continued Next Page)

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-04

PROJECT NUMBER VAN-00260722-A0 **CLIENT** ISL Engineering
PROJECT NAME Cedar Drive Expansion **PROJECT LOCATION** Cedar Drive, Coquitlam, BC
DRILLING DATE 2020-10-15 **AUGERHOLE LOCATION** ZONE: 10 N: 5459669.98 E: 520192.33
DRILLING CONTRACTOR Southland Drilling Co. Ltd. **ELEVATION** G.S
DRILLING METHOD Solid Stem Auger **GROUND WATER DEPTHS:** ▽ **AT TIME OF DRILLING** --- Below Grade
EQUIPMENT TYPE Truck Mounted Auger Drill ▼ **AT END OF DRILLING** ---
LOGGED BY SM **CHECKED BY** RM/WD ▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
9		CLAY, some silt to silty, trace to some fine sand, moist, higly platic, greyish-green, (stiff to firm) *(continued)*		AU-9			8 6 7		36
10		CLAYEY SILT, trace to some fine sand, medium to high plasticity, moist, greyish-green,(firm to very stiff)	9.4				6 7 8		
				AU-10			10 10 11		33
11		-becomes less clay, Silt, some clay, trace fine sand, wet, grey					11 12 12		35
12		-becomes Silt, some clay, trace fine sand, moist to wet, grey					15 17 17 17		
13				AU-12			17 18 18		35
14		SILT, trace fine sand, wet, grey, (very stiff to hard)	13.7				19 17 17		
15		-refusal to DCPT at ~17.4m, possible coarse gravel or cobble					19 19 18		
16							19 17 20		

(Continued Next Page)

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-04

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-15
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459669.98 E: 520192.33
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** --- Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
17		SILT, trace fine sand, wet, grey, (very stiff to hard) -refusal to DCPT at ~17.4m, possible coarse gravel or cobble *(continued)* -becomes trace gravel and cobble		AU-13			19 57 100+		43
18		Refusal to DCPT due to cobble -becomes trace clay, some sand to sandy, trace to some gravel, trace organics (seashell fragments), grey, medium to coarse sand, medium to coarse rounded gravel, moist to wet							
19				AU-14					36
20		SILTY SAND and GRAVEL, grey, moist, (very dense), [TILL-LIKE]	19.8	AU-15					11
21									

Bottom of hole at 21.3m.

NOTES: -End of Auger hole at 21.3m
-End of DCPT at 17.4m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Columbia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-05

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-14
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459603.87 E: 520144.41
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 0.9m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		SAND, trace to some silt, trace gravel, trace organics (rootlets), grey, dry, fine to medium sand, fine gravel (compact to loose)		AU-1			10		17
		PEAT, Amorphous to Fibrous, mixed with sand (fill) from above, back to orange, wet, (soft), [FILL]		AU-2			6 3		165
1		▽ SAND and SILT, trace organics (Peat, decayed wood), non-plastic, fine sand, brown, moist, (very loose to compact)	0.8	AU-3			2		59
		-Sand becomes coarser, (medium to coarse)		AU-4			3		38
		-becomes, Silty Sand, fine sand, trace organics (wood pieces)					7		
2							2		
				AU-5			7 6 5		69
3		-becomes wet					9 5		
				AU-6			13		33
4							10 14 11		
5				AU-7			11 8		36
		-lens of Silt, trace sand, trace to some clay, fine sand, moist, grey		AU-8			6 9		60
6							13 12 8		
7				AU-9			11 23 16		27
8		SILT, some sand, trace to some clay, fine sand, low plasticity, moist, grey, (firm)	8.0				11		

(Continued Next Page)

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-05

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-14
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459603.87 E: 520144.41
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 0.9m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL ⬠ MC LL 20 40 60 80
9		SILT, some sand, trace to some clay, fine sand, low plasticity, moist, grey, (firm) *(continued)*		AU-10			9 6 9		36
		-becomes trace clay, trace organics (occasional wood pieces)					7 7 7		
10				AU-11			7 8		52
		-becomes, Silty Sand, fine sand, moist, dark borwn		AU-12			10		45
11		SILTY CLAY, moist, greyish-blue, fine sand, highly plastic, (stiff)	11.0				12 11		35
				AU-13			11		
12		SILT, trace to some clay, trace organics (occasional small wood pieces), low to medium plastic, wet, grey, (stiff) -a seam of fine sand up to 12.5mm	12.2				12 13 12		
13							12		31
				AU-14			10 12 11		
14		-a seam of fine sand up to 12.5mm -no organics observed -a seam of fine sand up to 12.5mm					10 10		
				AU-15			9		33
15		-a seam of fine sand up to 12.5mm -sand pockets, medium to coarse -very difficult to auger at ~17.1m					10 10 9		
16				AU-16			10 10 11		40

(Continued Next Page)

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-05

PROJECT NUMBER VAN-00260722-A0
CLIENT ISL Engineering
PROJECT NAME Cedar Drive Expansion
PROJECT LOCATION Cedar Drive, Coquitlam, BC
DRILLING DATE 2020-10-14
AUGERHOLE LOCATION ZONE: 10 N: 5459603.87 E: 520144.41
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
ELEVATION G.S
DRILLING METHOD Solid Stem Auger
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 0.9m Below Grade
▼ **AT END OF DRILLING** ---
EQUIPMENT TYPE Truck Mounted Auger Drill
▼ **AFTER DRILLING** ---
LOGGED BY SM **CHECKED BY** RM/WD

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
17		SILT, trace to some clay, trace organics (occasional small wood pieces), low to medium plastic, wet, grey, (stiff) *(continued)*					10		
		SILTY SAND, some gravel to gravelly, moist, grey, fine to coarse sand, fine to medium gravel, (very dense), [TILL-LIKE]	17.1				53		
							90		
18				AU-17			100+		14
							Refusal to DCPT		

Bottom of hole at 18.6m.

NOTES: -End of Auger hole at 18.6m
-End of DCPT at 18.1m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-06

PROJECT NUMBER VAN-00260722-A0
CLIENT ISL Engineering
PROJECT NAME Cedar Drive Expansion
PROJECT LOCATION Cedar Drive, Coquitlam, BC
DRILLING DATE 2020-10-14
AUGERHOLE LOCATION ZONE: 10 N: 5459537.62 E: 520013.1
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
ELEVATION G.S
DRILLING METHOD Solid Stem Auger
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** ---
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---
LOGGED BY SM **CHECKED BY** RM/WD

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m	POCKET PEN. (kPa) / FIELD VANE SHEAR (kPa) Peak Remold	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
1		SILTY SAND and GRAVEL, mixed with peat and clay some silt, organics (wood pieces, wood debris, wood chunks and wood stump), fine to coarse sand, fine to medium, dry to wet, (very dense to loose), [FILL]		AU-1	AU		47, 50, 65		8
2				AU-2	AU		21, 6, 5, 2		50
3				AU-3	AU		5, 18, 5		39
		PEAT, Amorphous to Fibrous, moist to wet, black to orange, (firm)	3.0	AU-4	AU		5		207
				AU-5	AU		7		187
4		SAND and SILT, trace gravel trace organics (wood chunks, wood debris and decayed wood), fine sand (mostly coarse), fine to medium subangular to angular gravel, non plastic, moist, grey, (compact to very dense)	3.8	AU-6	AU		14, 10		28
		-a seam of Sand, trace silt, greyish-brown, medium to coarse (mostly coarse), at ~3.8m		AU-7	AU		11, 8		40
5				AU-8	AU		7, 12, 23, 12		34
6		-a seam of Sand, trace silt, greyish-brown, medium to coarse (mostly coarse) - no organics was observed -difficult to auger, 1.5m of auger flite broke inside the hole, approx. at 6.7m boulder, till-like material					20, 45		
7		-END OF AUGER HOLE; DCPT WILL CONTINUE	6.7				35, 100+		

Bottom of hole at 7.3m.

Refusal to DCPT, Penetrated 113mm, cobbles or boulders

NOTES: -End of Auger hole at 6.7m
-End of DCPT at 7.3m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

EXP Services Inc
3001 Wayburne Drive Unit 175A & Unit 275
Burnaby, British-Colombia V5G 4W3
Telephone: 604-874-1245

RECORD OF AUGERHOLE : AH20-07

PROJECT NUMBER VAN-00260722-A0
PROJECT NAME Cedar Drive Expansion
DRILLING DATE 2020-10-14
DRILLING CONTRACTOR Southland Drilling Co. Ltd.
DRILLING METHOD Solid Stem Auger
EQUIPMENT TYPE Truck Mounted Auger Drill
LOGGED BY SM **CHECKED BY** RM/WD

CLIENT ISL Engineering
PROJECT LOCATION Cedar Drive, Coquitlam, BC
AUGERHOLE LOCATION ZONE: 10 N: 5459582.62 E: 519922.26
ELEVATION G.S
GROUND WATER DEPTHS: ▽ **AT TIME OF DRILLING** 1.7m Below Grade
▼ **AT END OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m ▨ 20 40 60 80	POCKET PEN. (kPa) ⊙ 100 200 300 400 / FIELD VANE SHEAR (kPa) Peak ● Remold ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
1		SILTY SAND and GRAVEL, fine to coarse sand, fine to medium gravel, rounded to subangular, browinish-grey, dry, (very dense), [FILL]		AU-1	AU		50, 100+, 8		6
		PEAT, Amorphous to Fibrous, wet, black to orange, (soft to very soft)	1.1	AU-2	AU		4, 1, 0		34
2		▽ -becomes Fibrous Peat					0, 0		
3		SANDY SILT, trace gravel, trace organics (decayed wood), moist, grey, (soft to stiff)	2.7	AU-3	AU		4, 2		50
		-after ~2.89m becomes less sandy							
		SILT, sandy, trace gravel, trace to some organics (decayed wood and plant matter), fine to medium sand, fine angular gravel, dry to moist, grey, (soft to stiff)	3.2				6, 3		
4				AU-4	AU		7, 7, 6		51
5		-Sand becomes coarser					6, 8		
		-becomes clayey and less sandy, Silty Clay, trace sand and gravel, trace oxidation, fine to coarse sand, fine gravel, greyish-green, moist		AU-5	AU		12		27
			5.5	AU-6	AU		39, 59		10
6		SILTY SAND and GRAVEL, fine to coarse sand (mostly coarse), fine to coarse gravel, subangular to angular, moist, greyish blue, (very dense), [TILL-LIKE]					64		
		-after ~6.1m becomes very difficult to Auger					53		
7				AU-7	AU		84, 58		10
							Refusal to DCPT		

Bottom of hole at 7.6m.

NOTES: -End of Auger hole at 7.6m
-End of DCPT at 7.3m where it met refusal
-Please note some of the DCPT values maybe overstated due to encountering cobbles and coarse gravels

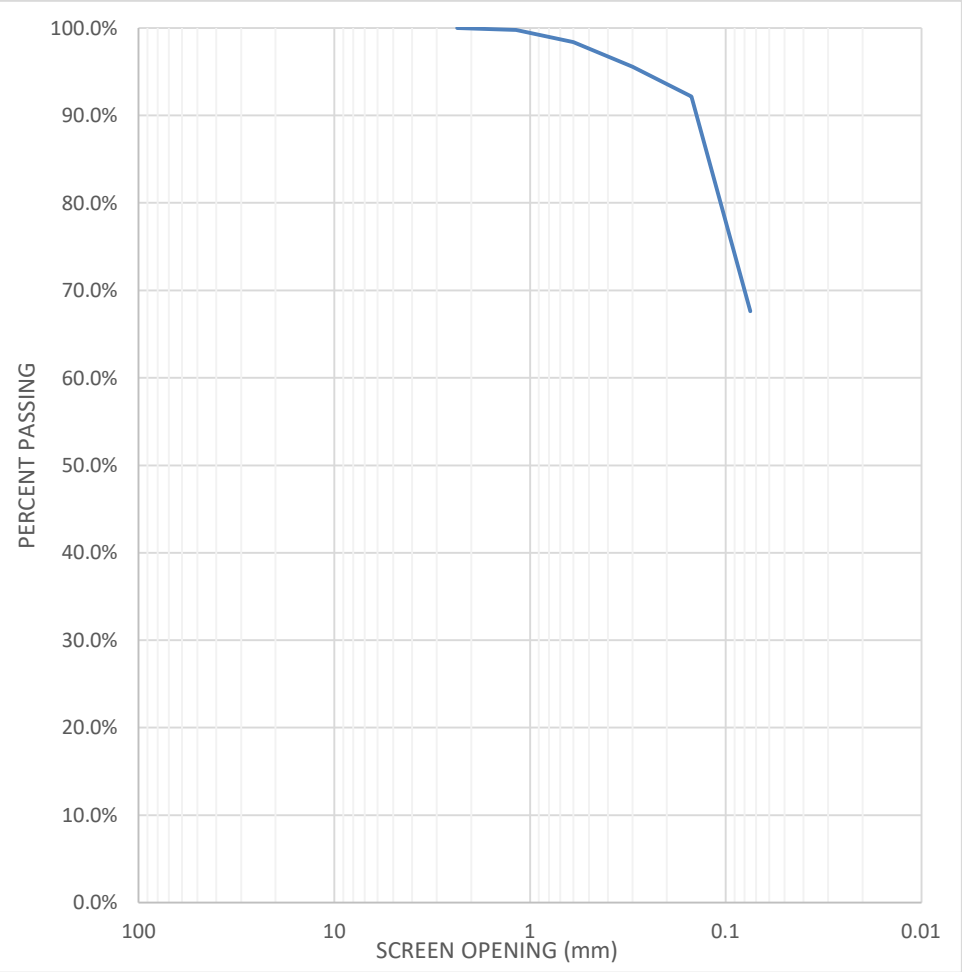
EXP GEO VAN-00260722-A0 S.M (TO BE USED) ORIGINAL LOGS - EDITED BY WD & RM.GPJ EXP STD.GDT 11/27/20

GEO 36
EXP Services Inc.
275 - 3001 Wayburne Drive
Burnaby, BC V5G 4W3
Telephone (604) 874-1245

SIEVE ANALYSIS
ASTM C136/C117

CLIENT	ISL ENGINEERING AND LAND SERVICES LTD.	PROJECT NUMBER	VAN-00260722-A0
PROJECT	CEDAR DRIVE RELOCATION, COQUITLAM, BC	SAMPLE DATE	2020-10-15
ADDRESS	CEDAR DRIVE, COQUITLAM, BC	TEST DATE	2020-11-19
SAMPLE INFORMATION			
SAMPLE DESCRIPTION	SANDY SILT/CLAY	METHOD	WASHED
SPECIFICATION		SAMPLED BY	SM
MATERIAL SOURCE		TESTED BY	AN
SAMPLE LOCATION	AH20-03- Depth 29'	REPORT NO.	1

SCREEN OPENING	PERCENT PASSING	SPECIFIED LIMITS
100.0 mm		
90.0 mm		
75.0 mm		
50.0mm		
37.5 mm		
25.0 mm		
19.0 mm		
16.0 mm		
12.5 mm		
9.5 mm		
4.75 mm		
2.36 mm	100.0%	
2.00 mm		
1.18 mm	99.8%	
850 um		
600 um	98.4%	
425 um		
300 um	95.5%	
180 um		
150 um	92.2%	
75 um	67.6%	



Comments:

Distribution: Kai-Sing Hui - EXP
Shahin Mohseni - EXP

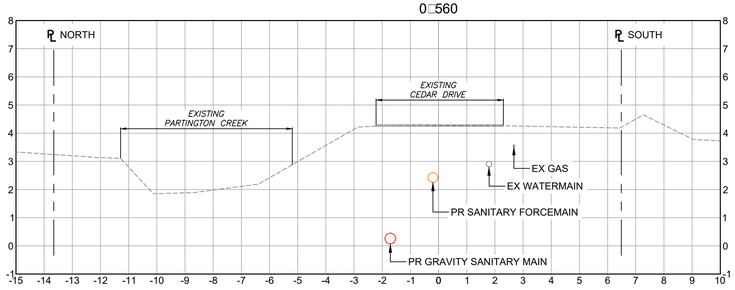
Prepared by:

Walker Nickerson
Project Coordinator

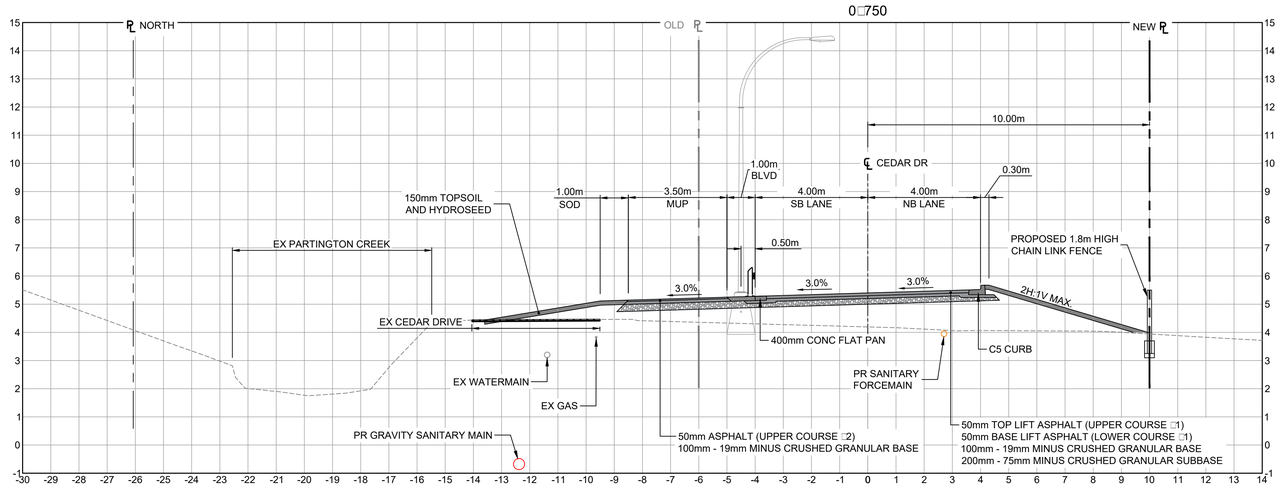
Reviewed by:

Parham Rabbani, PhD
Project Manager

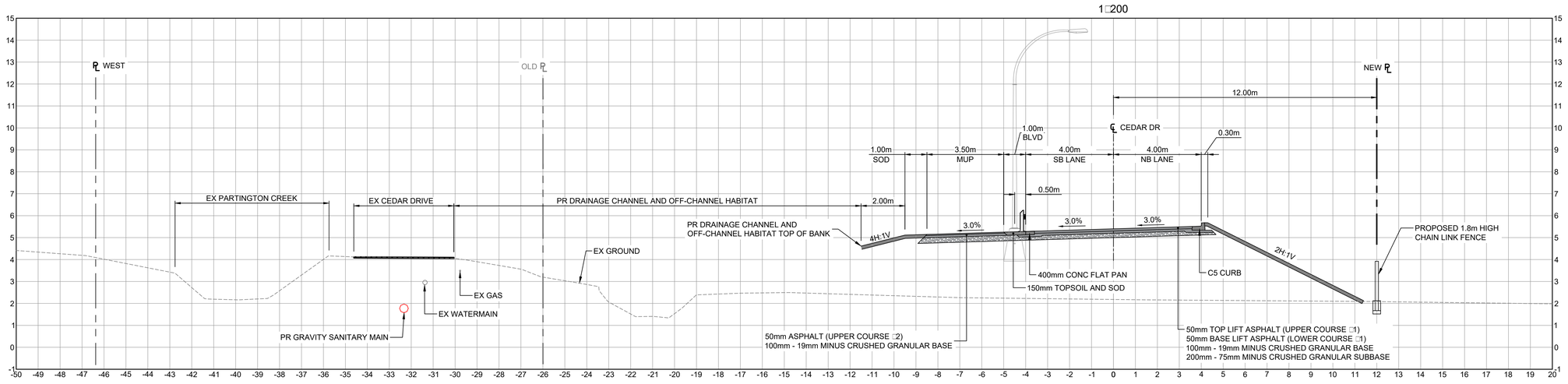
"Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of test results is provided only on written request."



PROPOSED SANITARY SEWERS ALONG EXISTING CEDAR DRIVE
TYPICAL SECTION
SCALE: 1:100



CEDAR DRIVE TYPICAL SECTION
FRONTING PROPERTY □4170
SCALE: 1:100



CEDAR DRIVE TYPICAL SECTION
FROM PROPERTY □4170 TO GILLEY'S TRAIL
SCALE: 1:100

PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: D□c□m□r 18, 2020

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
B	UPDATED PRELIMINARY DESIGN	20/06/30	GA	CJB
C	UPDATED PRELIMINARY DESIGN 2	20/08/18	GA	CJB
D	UPDATED PRELIMINARY DESIGN 3	20/12/18	GA	CJB

Coquitlam
E□g□□□r□g & P□□□c W□r□□
3000 G□d□rd Wa□, C□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
TYPICAL SECTIONS

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2699 F: (604)629-2698

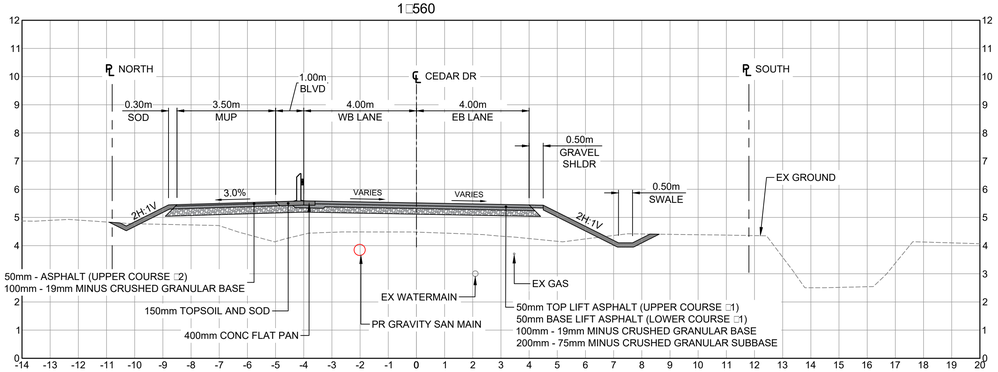
SCALE	1:100	DATE	Oct-20
DRAWN BY	GA	DESIGN BY	KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 01 OF 26
REV. D

DESTROY ALL PRINTS BEARING PREVIOUS NO.

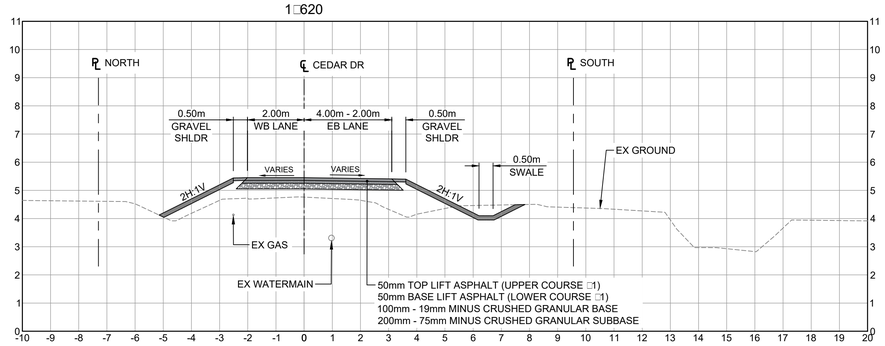
F□□ g: Pr□□c□□32000 32600 32628 s□□□c dar dr□□ pg/pad □□02 CADD 20□dra□g 203□□□□□32628_SH-T p□a□S c□□□.dwg

1□560



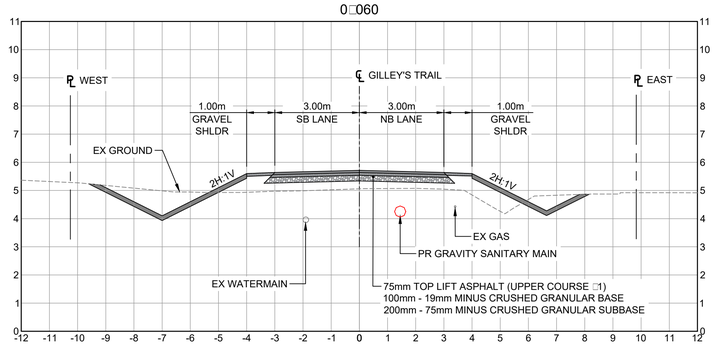
CEDAR DRIVE TYPICAL SECTION
FRONTING PROPERTY □4265
SCALE: 1:100

1□620



CEDAR DRIVE TYPICAL SECTION
FRONTING PROPERTY □1333
SCALE: 1:100

0□060



GILLEY'S TRAIL TYPICAL SECTION
SCALE: 1:100

PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: D□c□m□r 18, 2020

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
B	UPDATED PRELIMINARY DESIGN	20/06/30	GA	CJB
C	UPDATED PRELIMINARY DESIGN 2	20/08/18	GA	CJB
D	UPDATED PRELIMINARY DESIGN 3	20/12/18	GA	CJB

Coquitlam
E□g□□□r□g & P□□□c W□r□□
3000 G□□d□rd Wa□, C□□□□am, B.C. V3B 7N2

ROAD WORKS

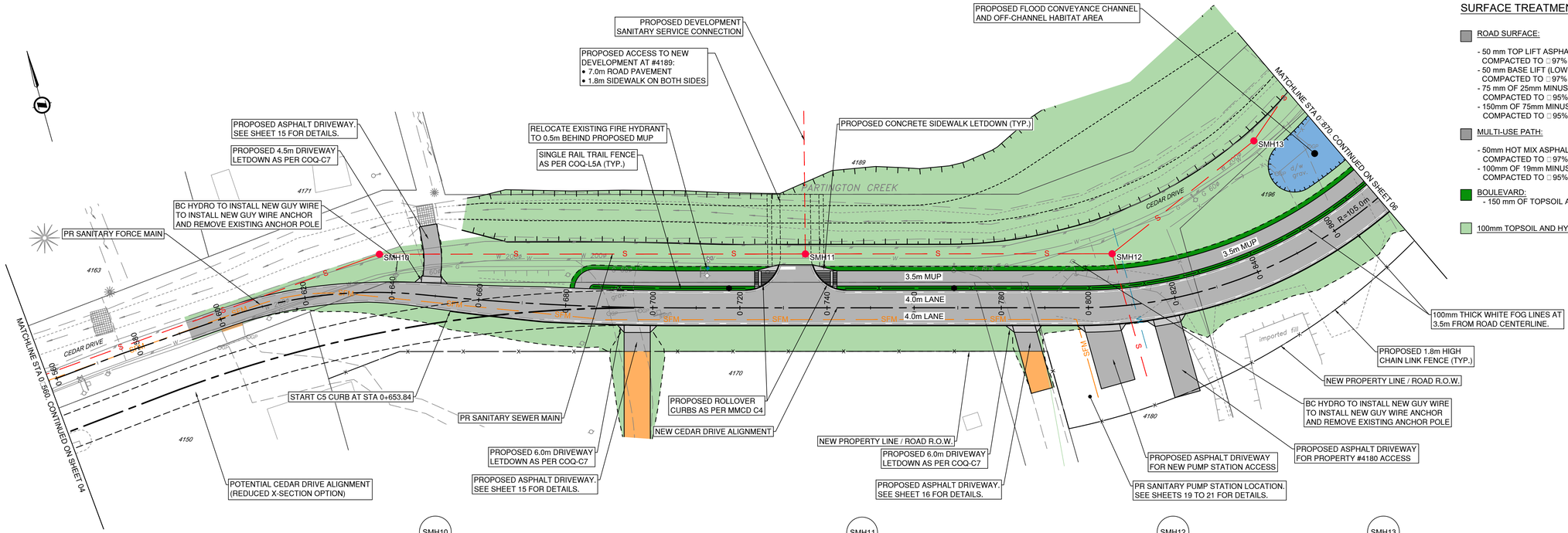
ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2699 F: (604)629-2698

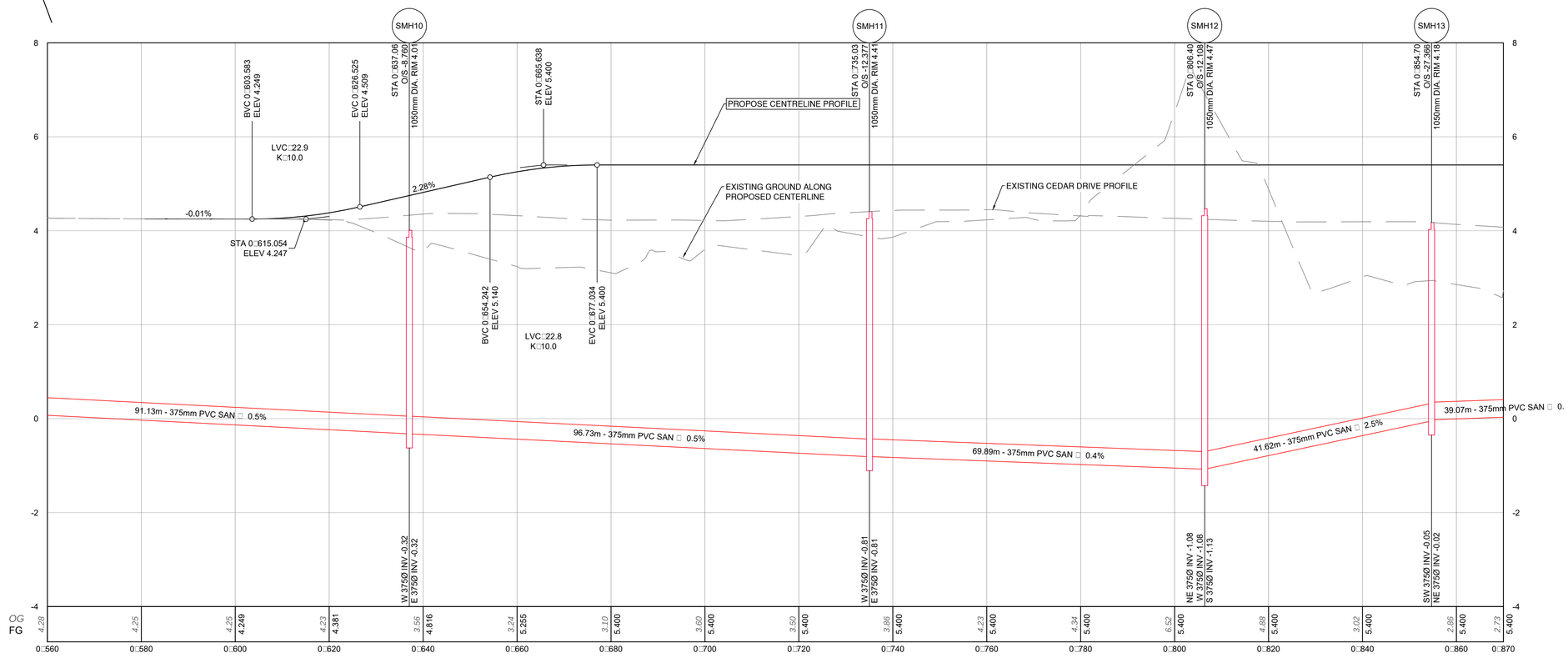
SCALE	1:100	DATE	Oct-20
DRAWN BY	GA	DESIGN BY	KPT
CHECKED BY	CJB	APPROVED BY	KPT
			REV. D

DWG. NO. 02 OF 26

DESTROY ALL PRINTS BEARING PREVIOUS NO.

E□□g. Pr□□c□32000 32600 32628 c□□c dar dr□□ pgrad □02 CADD 20 dra□□g 203□□□□□32628_SH□T p□a□S c□□□.dwg





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PRELIMINARY DESIGN

DESIGN NO. 32628

PLOT DATE: Ja□ar□ 4, 2021

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
B	UPDATED PRELIMINARY DESIGN	20/06/30	GA	CJB
C	UPDATED PRELIMINARY DESIGN 2	20/08/18	GA	CJB
D	UPDATED PRELIMINARY DESIGN 3	20/12/18	GA	CJB

Coquitlam
E□g□□□r□g & P□□□c W□r□
3000 G□□d□rd Wa□, C□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
STA 0□560 TO 0□870

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	DATE	Jan-21
DRAWN BY	GA	DESIGN BY	KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 05 OF 26
REV. D

DESTROY ALL PRINTS BEARING PREVIOUS NO.

F□g Pr□□□:32000.32600.32628_c□□□e_dar_dr□□□pgrad□02 CADD 20..dra□□g 203□□□□□32628 SH R aaw r□□□a_d Sa□ar□dwg

SURFACE TREATMENT

ROAD SURFACE:

- 50 mm TOP LIFT ASPHALT (UPPER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 50 mm BASE LIFT (LOWER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 75 mm OF 25mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY
- 150mm OF 75mm MINUS CRUSHED GRANULAR SUBBASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY

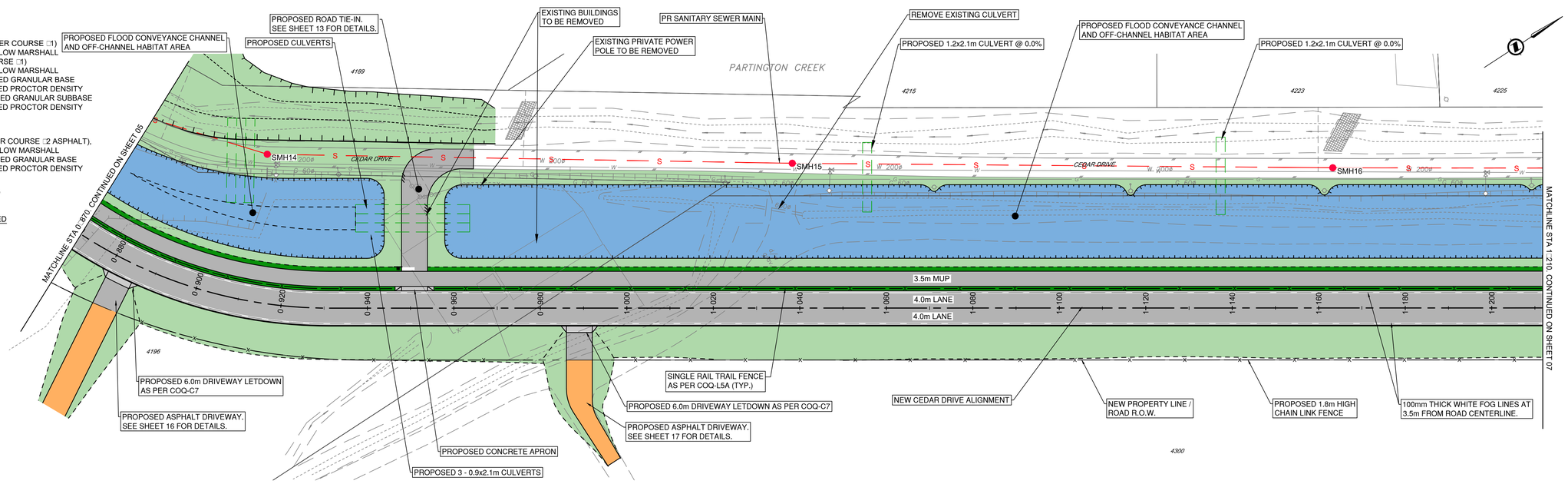
MULTI-USE PATH:

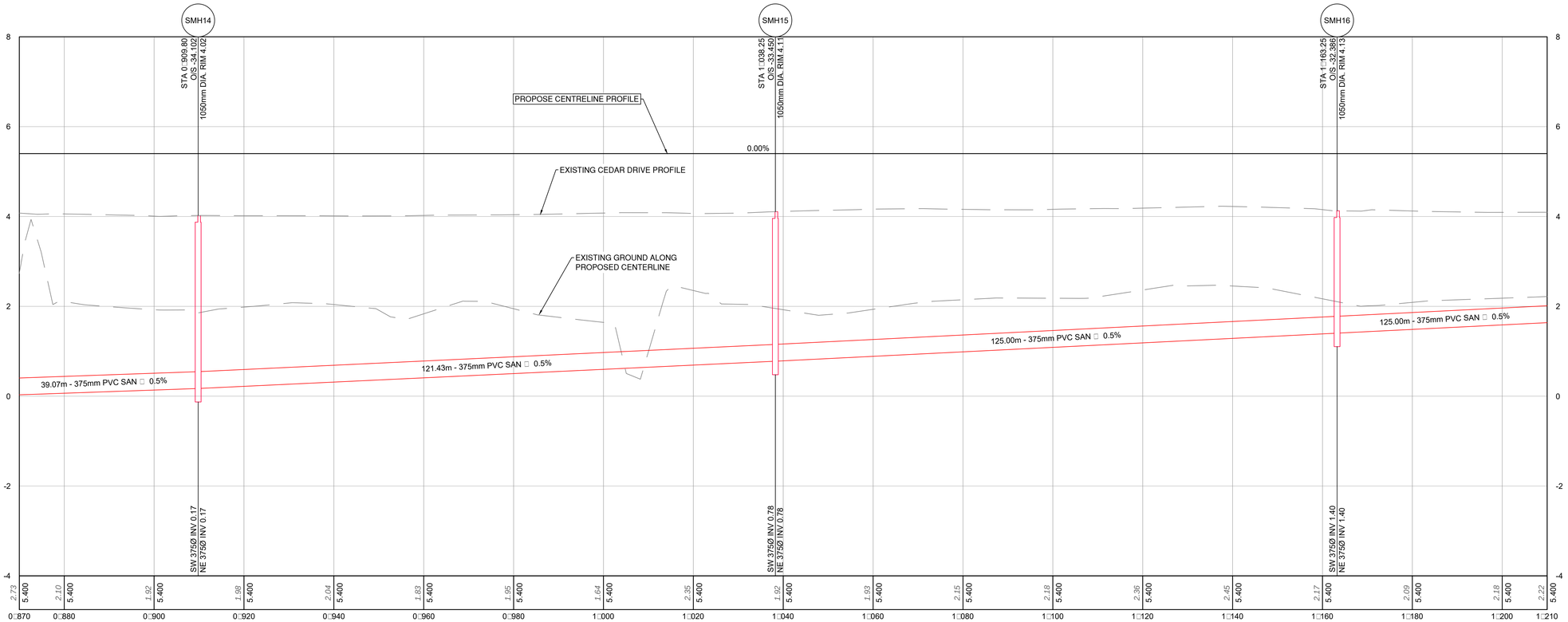
- 50mm HOT MIX ASPHALT (UPPER COURSE □2 ASPHALT), COMPACTED TO □97% OF 75 BLOW MARSHALL
- 100mm OF 19mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY

BOULEVARD:

- 150 mm OF TOPSOIL AND SOD

100mm TOPSOIL AND HYDROSEED





1:500 (0, 10, 30m)

PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: Ja□ar□4, 2021

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
B	UPDATED PRELIMINARY DESIGN	20/06/30	GA	CJB
C	UPDATED PRELIMINARY DESIGN 2	20/08/18	GA	CJB
D	UPDATED PRELIMINARY DESIGN 3	20/12/16	GA	CJB

Coquitlam
E□g□□□r□g & P□□□c W□r□□
3000 G□□d□rd Wa□, C□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
STA 0□910 TO 1□250

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2690 F: (604)629-2698

SCALE	AS SHOWN	DATE	Jan-21
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CHECKED BY	CJB	APPROVED BY	KPT
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DWG. NO. 06 OF 26

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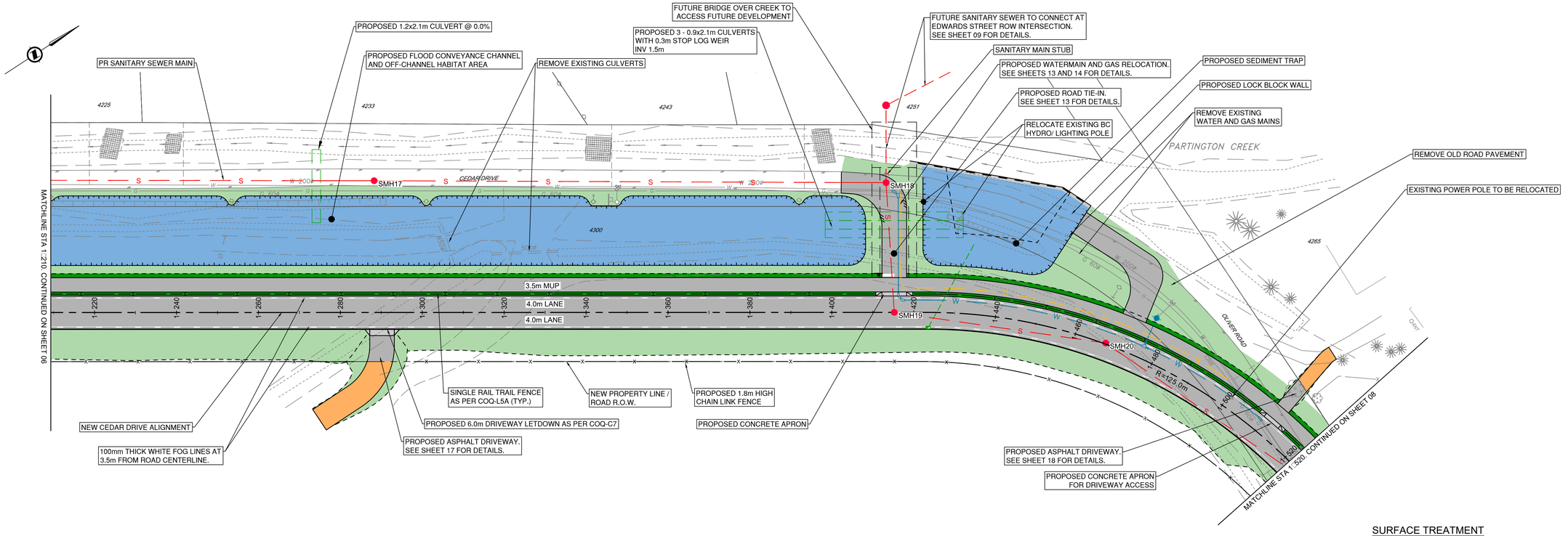


SURFACE TREATMENT

ROAD SURFACE:

- 50 mm TOP LIFT ASPHALT (UPPER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 50 mm BASE LIFT (LOWER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 75 mm OF 25mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY
- 150mm OF 75mm MINUS CRUSHED GRANULAR SUBBASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY

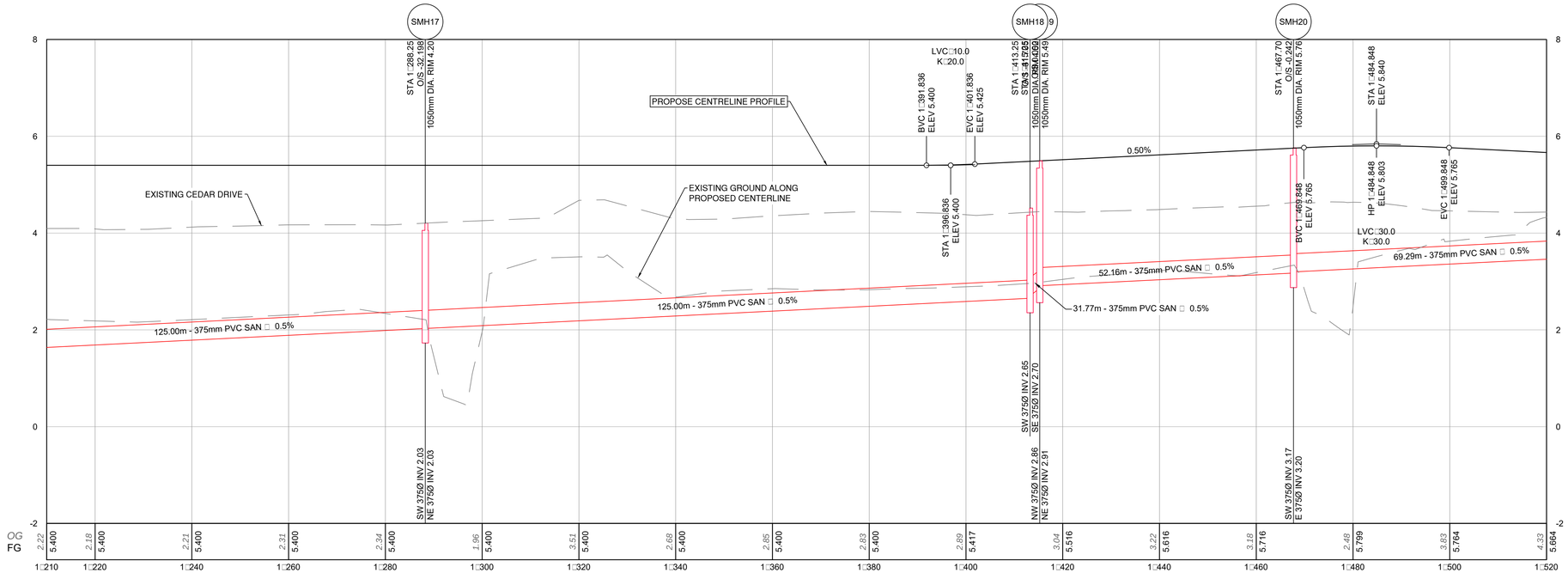
MULTI-USE PATH:

- 50mm HOT MIX ASPHALT (UPPER COURSE □2 ASPHALT), COMPACTED TO □97% OF 75 BLOW MARSHALL
- 100mm OF 19mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY

BOULEVARD:

- 150 mm OF TOPSOIL AND SOD

100mm TOPSOIL AND HYDROSEED



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PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: Ja□ar□4, 2021

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C	UPDATED PRELIMINARY DESIGN 2	20/08/18	GA	CJB
D	UPDATED PRELIMINARY DESIGN 3	20/12/18	GA	CJB

Coquitlam
E□g□□r□□g & P□□□c W□r□□
3000 G□□d□nd Wa□, C□□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
STA 1□210 TO 1□520

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	DATE	Jan-21
DRAWN BY	GA	DESIGN BY	KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 07 OF 26
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DESTROY ALL PRINTS BEARING PREVIOUS NO.

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SURFACE TREATMENT

ROAD SURFACE:

- 50 mm TOP LIFT ASPHALT (UPPER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 50 mm BASE LIFT (LOWER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 75 mm OF 25mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY
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MULTI-USE PATH:

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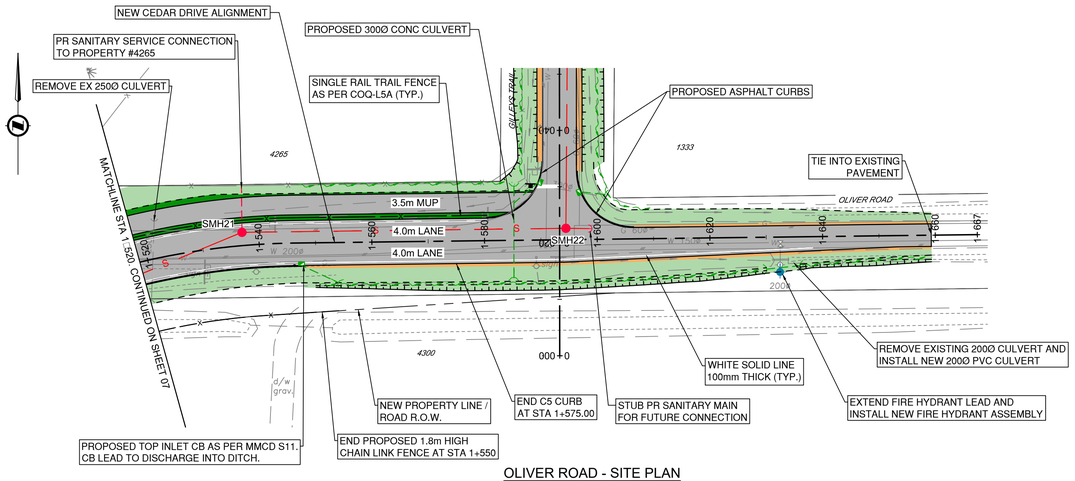
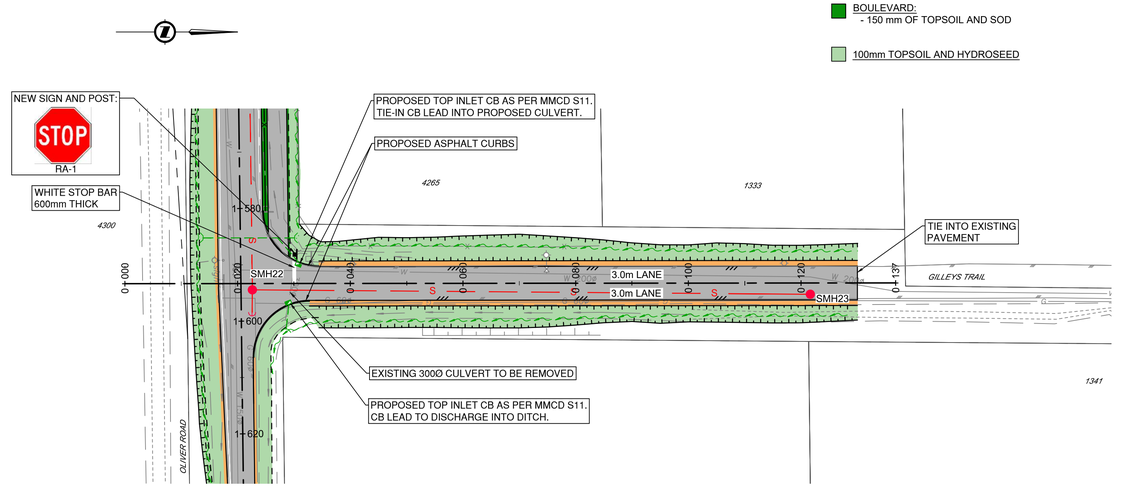
BOULEVARD:
- 150 mm OF TOPSOIL AND SOD

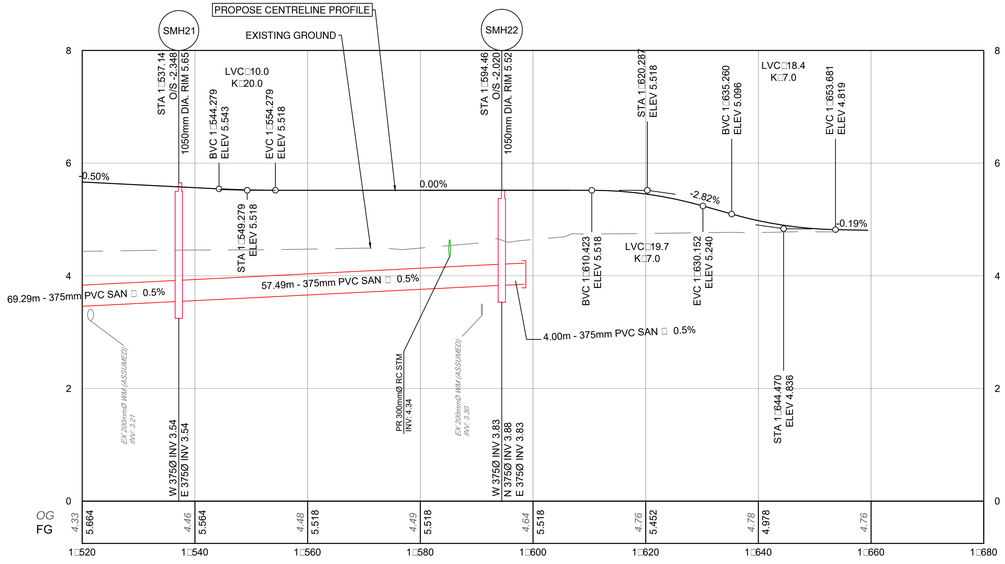
100mm TOPSOIL AND HYDROSEED



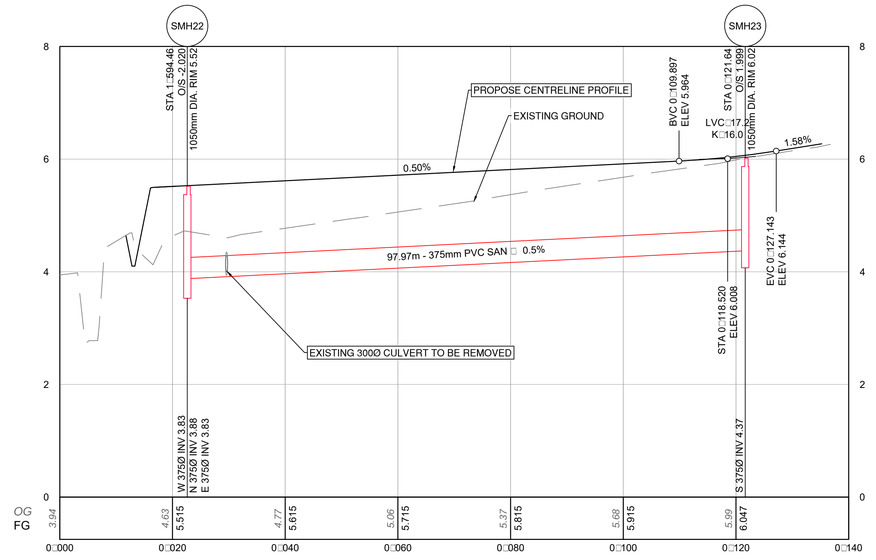
OLIVER ROAD - SITE PLAN
SCALE: 1:500



GILLEYS TRAIL - SITE PLAN
SCALE: 1:500



OLIVER ROAD - PROFILE VIEW
SCALE: 1:500H / 1:50V



GILLEYS TRAIL - PROFILE VIEW
SCALE: 1:500H / 1:50V

1:500 0 10 30m

PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: Ja□ar□4, 2021

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
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Coquitlam
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3000 G□□d□rd Wa□, C□□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
STA 1□520 TO 1□680 AND GILLEY'S TRAIL

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	DATE	Jan-21
DRAWN BY	GA	DESIGN BY	KPT
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			REV. D

DWG. NO. 08 OF 26

DESTROY ALL PRINTS BEARING PREVIOUS NO.

F□□g: Pr□□c□32000 32600 32628 s□□□c dar dr□□ pgrad□□02 CADD 20□dra□□g 203□□□□□32628_SH R_adw r□□□a d Sa□□ar□.dwg

SURFACE TREATMENT

ROAD SURFACE:
- 50 mm TOP LIFT ASPHALT (UPPER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 50 mm BASE LIFT (LOWER COURSE □1) COMPACTED TO □97% OF 75 BLOW MARSHALL
- 75 mm OF 25mm MINUS CRUSHED GRANULAR BASE COMPACTED TO □95% MODIFIED PROCTOR DENSITY
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MULTI-USE PATH:
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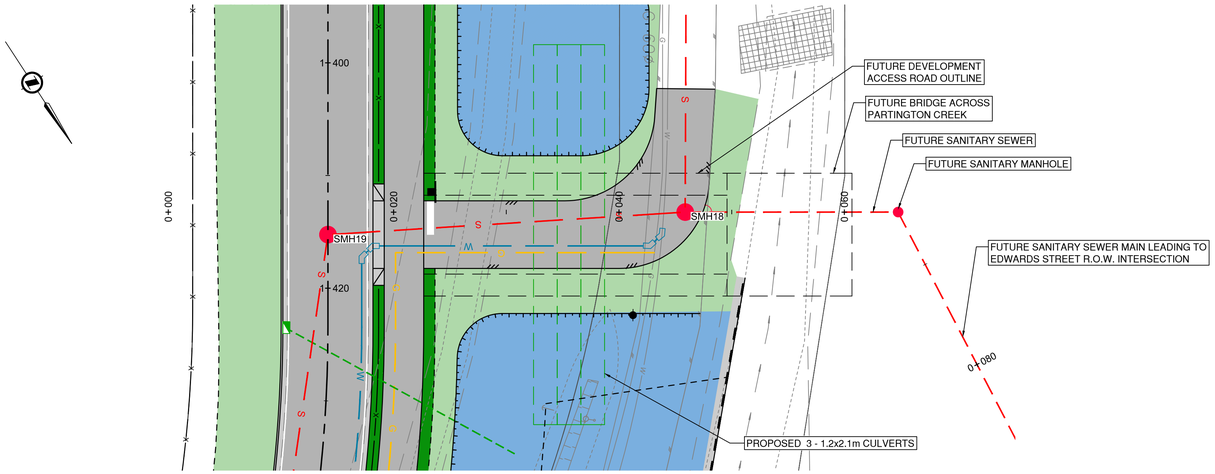
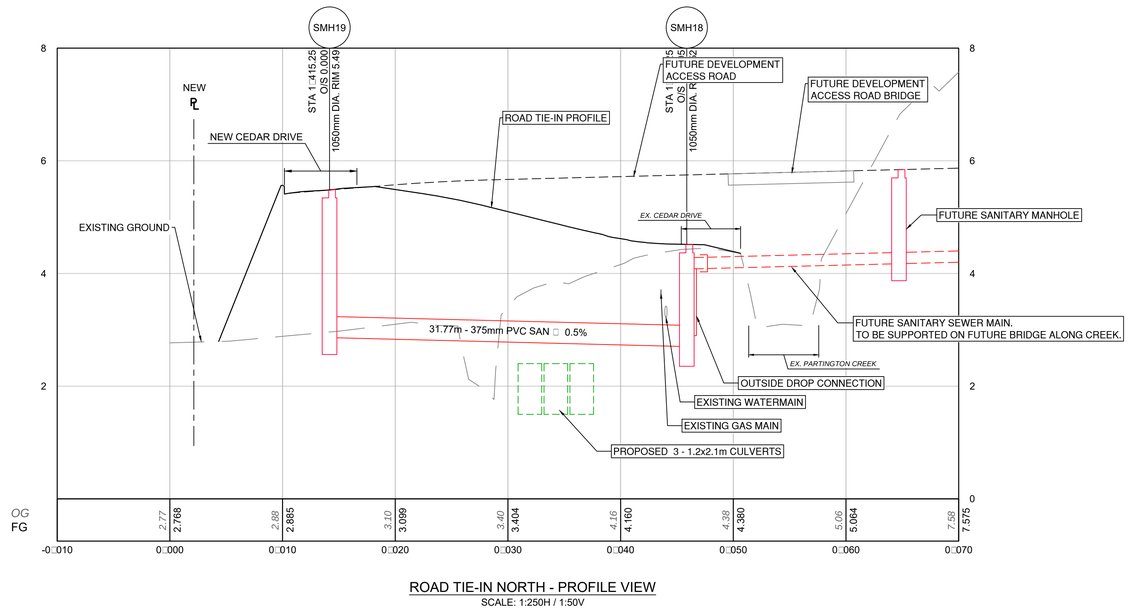
BOULEVARD:
- 150 mm OF TOPSOIL AND SOD

100mm TOPSOIL AND HYDROSEED



ROAD TIE-IN NORTH - SITE PLAN
SCALE: 1:250



ROAD TIE-IN NORTH - PROFILE VIEW
SCALE: 1:250H / 1:50V

PLOT DATE: Ja□ar□4, 2021

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	20/05/21	GA	KPT
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D	UPDATED PRELIMINARY DESIGN 3	20/12/18	GA	CJB

Coquitlam
E□g□□□r□g & P□□□c W□r□□
3000 G□□d□rd Wa□, C□□□□am, B.C. V3B 7N2

ROAD WORKS

CEDAR DRIVE
NORTH SANITARY TIE-IN

1:250 0 5 15m

PRELIMINARY DESIGN DESIGN NO. 32628

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	DATE	Jan-21
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DWG. NO. 09 OF 26
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DESTROY ALL PRINTS BEARING PREVIOUS NO.

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Appendix F -

Knotweed Management Plan – Partington Creek and Cedar Drive – Coquitlam, BC

Knotweed Management Plan – Partington Creek and Cedar Drive – Coquitlam, BC

April 20, 2023

Submitted to:

Nadeem Kazmi
City of Coquitlam
Engineering and Public Works Department
500 Mariner Way
Coquitlam, BC
V3K 7B6

DIAMOND HEAD
3559 Commercial Street
Vancouver, BC 604.733.4886

SAFE CERTIFIED

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1.0 Introduction

Diamond Head Consulting Ltd. (DHC) has been retained by the City of Coquitlam Engineering and Public Works Department to provide a knotweed management plan for the off site removal and on site stockpiling of knotweed plants that are located within the project footprint of two sediment ponds that will be constructed along Cedar Drive; north pond and south pond. Amy Hendel, RBTech, visited and assessed the site on March 30 and April 12, 2023. The purpose of this plan is to provide appropriate knotweed management procedures for excavation, removal and on site stockpiling of knotweed plant material and infested soil as well as procedures for cleaning and disinfection of machinery and equipment.

2.0 Background Information

Japanese knotweed (*Fallopia japonica*) is a non-native invasive plant. It forms extensive underground root systems that can extend up to 3 meters deep and 20 meters laterally. These expansive rhizomes are much larger than expected for a plant of its size, creating significant challenges for control. It spreads primarily by rhizomes and can sprout new plants from root and stem segments. Even very small fragments of root material (as small as 0.7 grams) can sprout new plants. Buried fragments at depths greater than 1 meter have been observed to regenerate and revegetate previously cleared areas. Japanese knotweed can also form hybrid varieties with related knotweed species to produce viable wind-dispersed seed with very high germination rates. Bohemian knotweed is such a hybrid and is indistinguishable from Japanese knotweed without genetic testing. Japanese and bohemian knotweed are the two most common knotweed species in Metro Vancouver.

Knotweeds can cause serious social, economic, and environmental impacts, including causing significant disruption of local ecosystems. They can tolerate a wide variety of site conditions such as high salinity, drought, high heat, or high levels of shade. In a construction and development setting, the plant can grow through a variety of barriers including landscape fabric, plastic, riprap, gravel, asphalt, building foundations, and cracks in cement. This can pose a threat to the structural integrity of buildings and infrastructure.

Chemical treatment of knotweed species is the most effective treatment option due to the extensive root system. Currently, the most effective chemical treatment option for knotweed is herbicide application by combination of stem injection and foliar application using a glyphosate-based formulation. Both methods cause translocation of the active herbicide to the root system. Stem injection has the advantage of reducing non-target effects; however, stem injection utilizes a far greater amount of herbicide per square meter than foliar application.

Chemical control methods can take up to three years to control a knotweed population. Follow-up inspections for re-growth are critical to ensure complete mortality and are required under the *Integrated Pest Management Act*. Re-growth has been known to occur 10 or more years beyond initial treatment.

Treatment can occur any time during the growing season, but it is best to initially target an infestation once stems are fully leafed out and prior to stems decaying in the fall (late May to the end of September). If knotweed is growing within 10 meters of a watercourse/riparian area, the BC Provincial Integrated Pest Management Regulation provides standards for application of herbicides in proximity to sensitive habitats and water bodies. Herbicide applicators must have a valid Applicator's License and a Pesticide Use Permit.

3.0 Site Assessment

There are several knotweed areas present in the construction footprint of both the north and south sedimentation ponds: north pond (Figure 1) and south pond (Figure 2). North pond: knotweed is located along the north side of Cedar Drive/south bank of Partington Creek. The total area of knotweed is 20 m^2 (Photos 1 and 2). South pond: knotweed is located on the north side of Cedar Drive/south bank of Partington Creek and along the north bank of Partington Creek. The total knotweed area is 240 m^2 (Photos 3 and 4).

Figure 1. Location of proposed north pond (red shaded area).

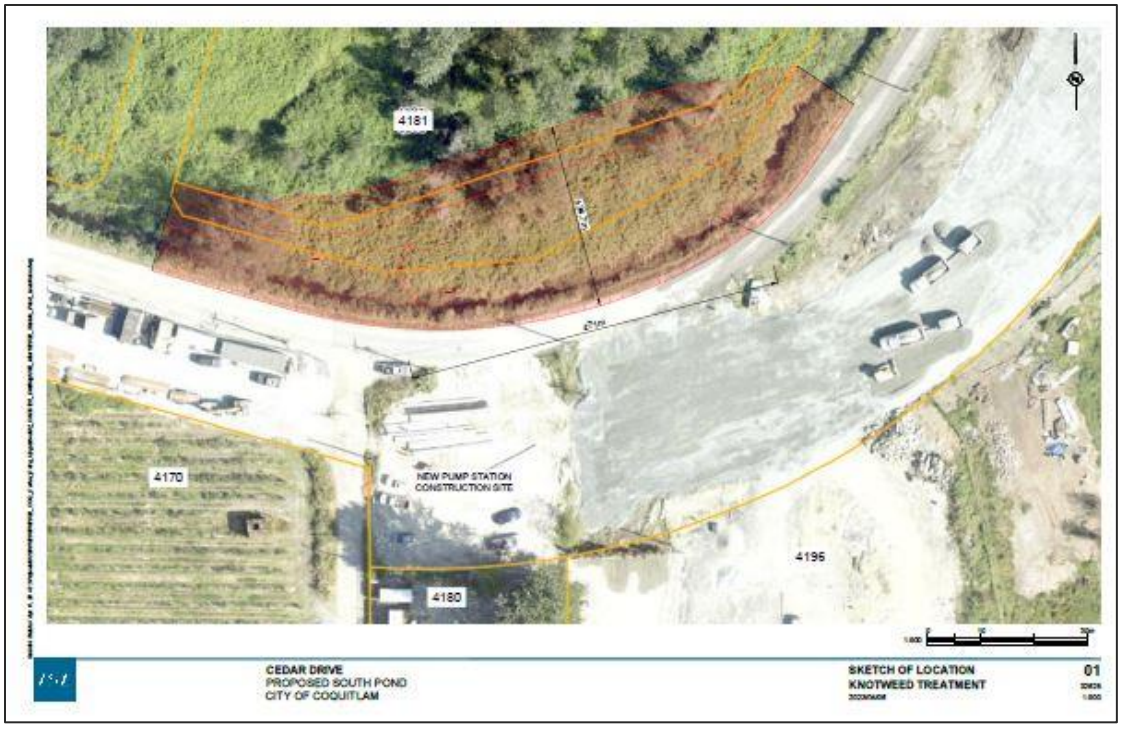

Figure 2. Location of proposed south pond (red shaded area).

Photo 1. Location of knotweed at proposed north pond.

Photo 2. Location of knotweed at proposed north pond.

Photo 3. Location of knotweed at proposed south pond.

Photo 5. Location of knotweed at proposed south pond.

4.0 Knotweed Management Plan

Proposed road and drainage channel works will be taking place in Partington Creek and on Cedar Drive in 2023. The construction of two sedimentation ponds; north pond and south pond will occur in areas that have knotweed plants. A knotweed treatment program has been in place since 2021 along both sides of Cedar Drive. The knotweed that is present in the construction footprint of both ponds cannot be chemically treated as it is within 1 m of the high water mark of the creek where herbicide application is prohibited therefore plants in these areas are still present. Knotweed in the pond locations will need to be excavated and taken off site and stockpiled at 1341 Gilley's Trail where it will be chemically treated and monitored.

The knotweed will be excavated under the supervision of a QEP (Qualified Environmental Professional) knotweed specialist. The knotweed infestations should not be disturbed until excavation occurs. Disturbance of the plant or roots can lead to further spread through the site.

The following sub-sections detail recommended procedures for implementing this knotweed management plan and ongoing monitoring.

4.1 Excavation of knotweed areas

Excavation requires the removal of all plant material including above ground stems and below ground roots. The BC Ministry of Transportation and Infrastructure recommends excavating to a depth of 3 m and an area extending 20 m from the edges of the above ground growth. This represents a large soil volume and is rarely realistic due to site constraints. However, it is difficult to determine the dimensions of excavation required without seeing the roots. For this reason, excavation should be supervised by a QEP knotweed specialist to ensure that as much root material is removed as realistically feasible. Excavation must be undertaken with great care as this activity has a high risk of spreading plant fragments.

Knotweed plants located in the excavation zone can be excavated to a depth of 2 m, possibly 3 m in specific areas and an area extending 2 m from the edge of the knotweed infestation. Above ground plant material and infested soils can be taken off site together.

Excavation will be supervised by DHC to ensure that as much root material is removed as realistically feasible. Excavation must be undertaken with great care as this activity has a high risk of spreading plant fragments.

4.2 Site preparation and spread prevention

The proposed stockpile area must be away from any water courses, ecologically sensitive areas, or wells. The site should be at least 10 meters away from water and drinking wells to enable herbicide treatment and prevent accidental transport during rain events. Excavation must occur on days with no forecasted rainfall. Before transporting the infested soil and plant material to the stockpile site a 30 mm polysheeting barrier must be placed on the ground where the pile will be placed.

The silt fencing must be installed around the perimeter of the stockpile immediately after the material is placed on the polysheeting. This will serve to contain any soil movement due to erosion related to rain events. Silt fencing should be installed to the manufacturer's specification, facing uphill with at least 6 inches of the fence installed below the surface grade. Use of a small excavator to dig a small trench can aid in installation and ensure the fence remains securely in place. Silt fencing will still allow water to exit the stockpile during rain events but will prevent the movement of sediments and any knotweed root material that may be present.

The stockpile cannot be managed effectively if it is piled too high and steep as this would make it difficult to thoroughly treat knotweed growth.

It is recommended that the **soil be spread over a larger area at a lower height**. Reducing the pile height will:

- Create more surface area, allowing more opportunity for plants to emerge and expediate knotweed control
- Decrease the chance of erosion and spread by rain and wind events

- Allow easy and safe access for the contractor to monitor and treat the pile

DHC should monitor the stockpiling process to ensure that the gradient of the pile is at a manageable height. The pile should not be covered. Hydroseeding should be applied to keep soil in place. If soil has moved beyond the new silt fence perimeter, it should be moved back onto the polysheeting.

4.3 Transport of stockpile materials

DHC will be present at the stockpile site for loading and unloading. All trucks must remain on the paved surfaces while loading material at the excavation site. Any tracked out material on local roads from the project site should be disposed of or stored within the stockpile. To reduce the risk of plant parts, rhizomes, or seeds escaping during transport, all material should be tarped and strapped securely.

4.4 Cleaning and disinfection of equipment

To avoid spread of knotweed contaminated soil and plant material, vehicles, machinery, and clothing should be inspected for plant material and thoroughly washed before leaving the site with attention specifically to the excavator bucket, under carriage, tracks, and truck beds. Equipment and machinery should be cleaned and disinfected by hot power washing; wash with 180 °F water at 6 gpm, 2000 psi with a contact time of ≥ 10 seconds on all surfaces to remove dirt, organic matter such as vegetation and seeds. This should be done in a contained area on site preferably on a hard surface away from the construction zone.

4.5 Stockpile treatment and monitoring

A treatment and monitoring plan should be in place for three treatment and monitoring visits annually. It is recommended that soil be rotated by an excavator to stimulate knotweed growth from rhizomes within the soil. This should occur once in early spring prior to the first treatment. This activity should be monitored by DHC and follow all the procedures for cleaning and disinfection of equipment.

The stockpile will need to be monitored for re-growth and chemically treated until no growth is observed for a minimum of three years.

Table 1 summarizes annual knotweed management tasks and timing.

Table 1. Summary of annual knotweed management tasks

Management Task	Timing
Rotate soil	Once annually - Late March to Mid April
Chemical treatment and monitoring	Three visits during the growing season – June to October

4.6 Spread prevention and monitoring

To avoid spread of knotweed contaminated soil and plant material, vehicles, machinery and clothing should be inspected for plant material and thoroughly washed before leaving the site. Even though

knotweed will be excavated and removed off site, the property should continue to be monitored for knotweed. The QEP should be informed about any new growth after the knotweed has been removed so they can advise regarding treatment and removal of new growth.

5.0 Limitations

The knotweed site assessment was completed in March and early April when knotweed is still dormant. Identification was done by identifying the dead knotweed stems from the 2022 season. The extent of the knotweed infestations often appears smaller during the winter/early spring when the leaves are not present. The knotweed excavation areas should be reassessed in early summer to have a more accurate estimate of soil volume.

6.0 Concluding Remarks

If you have any questions or require clarification, please contact us any time.

DIAMOND HEAD CONSULTING LTD.

Amy Hendel, RBTech
Field Operations Manager
604-733-4886 ext. 243
amy@diamondheadconsulting.com

Fiona Steele, RPBio
Principal, Senior Biologist
604-733-4886 ext. 221
fiona@diamondheadconsulting.com

Appendix G -

Water Meter Specifications

CITY OF COQUITLAM

WATER METER SPECIFICATIONS

February, 2022

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5	Meter Types	3
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10	Installation Requirements	6
11	Materials	8
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13	Temporary Connections	11
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	16-25mm Positive Displacement Meter Installation	WM-2
	38-50mm Positive Displacement Meter Installation	WM-3
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1. Preamble

The following specifications detail the City's requirements for the installation of meters on City water service connections.

An applicant is responsible for the supply and installation of meters and associated piping, chambers and equipment on metered water service connections. The City must accept the installation prior to activation of the service.

The specifications identifies acceptable meter types, location and installation requirements.

2. Definitions

ANSI: American National Standards Institute.

ASTM: American Society for Testing and Materials.

AWWA: American Water Works Association

Activation: Opening of the service valve to permit the flow of water.

Applicant: A person, company or agency that makes application for a water service connection from the City water system as required by the City's Water Distribution Bylaw.

Engineer: A professional engineer registered in the province of British Columbia practicing in the field of Civil or Mechanical Engineering.

FM: Factory Mutual Engineering and Research Organization, a research and testing agency accepted by the Insurance Industry.

NSF: NSF International

ULC: Underwriters' Laboratories of Canada, a research and testing agency accepted by the Insurance Industry.

Water Distribution Bylaw: Refers to the City of Coquitlam Water Distribution Bylaw 4428 as amended.

3. Services to be Metered

The Water Distribution Bylaw identifies service connections that require meters. This includes but is not limited to all property intended for commercial, industrial, institutional, agricultural, and public. All service connections to such properties including fire and domestic services shall have meters.
Fire service rated combined fire/domestic meters are allowed only in existing water systems when replacing the existing meters and not allowed in new developments; new developments must have separate fire and domestic lines as per drawing WM -1.

4. Location of Meters

Meters shall be placed at the interface between the City and private water system. In most circumstances the interface occurs at the property line of the site. The meter and meter box, vault or chamber shall be located entirely on private property unless approved otherwise by the City.

Where a City water main is within private property in a right-of-way, place the meter and box, vault or chamber at the right-of-way boundary line, and outside the right-of-way.

Where possible locate meters in landscaped areas, free of obstructions. If unavoidable, meters may be placed in pedestrian path areas or parking stalls. If the meter is placed in a parking stall, the pit-radio transceiver should be placed in a smaller box where it may be easily accessed and off parking stalls (refer drawing WM-7). Meters must not be located in driveways or roadways/highways.

Vaults and chambers should be placed in proximity to the site drainage system to permit installation of a gravity drain from the vaults and chambers.

5. Meter Types

There are three types of cold-water meters accepted for use by the City. These are positive displacement, turbine and compound types. The meters must be radio-read meters coupled with a radio transceiver unit that will function with the City's current Advanced Metering Infrastructure (AMI) system.

The actual meter or combination of meters accepted for use must accurately account for the total water use of the property serviced. All meters must be new. Used or reconditioned meters are not accepted.

Positive Displacement meters are to be either nutating disk or oscillating piston type to AWWA C-700. Meters are to have a lead free bronze (NSF/ANSI 61, Annex G and Annex F) case with cast iron or plastic frost protection cover. Meters 38mm and 50mm in size are to have oval two bolt flanged ends.

Acceptable positive displacement type meters are:

- Sensus SRII coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver
- Neptune T-10 coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver

  * *Equivalent means the radio transceiver unit that is compatible with City's current AMI system.*

Neptune R900i meters are **not** accepted.

Turbine meters are to conform to the AWWA C-701 class II. All turbine meters are to have lead free bronze (NSF/ANSI 61, Annex G and Annex F), stainless steel or ductile iron with epoxy coating cases and flanged connections. 38mm and 50 mm sizes are to have oval two bolt flanges. Meters are to have horizontal turbines.

Individual turbine meters are acceptable only in applications involving continuous high flows such as dedicated irrigation systems or some industrial processes. **Use of turbine meters requires City approval**.

Acceptable turbine type meters are:

- Sensus OMNI R^2, T^2 coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver
  Neptune HP coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver
  * *Equivalent means the radio transceiver unit that is compatible with City's current AMI system.*

Compound meters are to conform to AWWA C-702. All compound meters are to have lead free bronze (NSF/ANSI 61, Annex G and Annex F), stainless steel or ductile iron with epoxy coating cases and flanged connections. Meters 50mm in diameter are to have oval two bolt flanges.

Acceptable compound meters are:

- Sensus OMNI C^2 coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver
- Neptune TRU/FLO coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver with Double Pair wire
  * *Equivalent means the radio transceiver unit that is compatible with City's current AMI system.*

6. Registers

All meters are to have direct reading, sealed absolute encoder registers. The unit of measure shall be cubic meters. Registers must be new. Used or reconditioned registers are not acceptable. All registers shall be programmed to read all digits left of the decimal place (minimum 5 digits).

Acceptable encoder registers for indoor use are:

- Sensus Electronic Register+; Omni Register+
- Neptune Procoder Register

Acceptable encoder registers for pit installations are:

- Sensus Electronic Register+ WP (waterproof), Omni Register+
- Neptune Procoder Register

7. Meter Selection

The type or combination of types of meters to be used for recording water consumption from a service connection must accurately record consumption over the expected range of flow. The meter size selected shall ensure pressure losses are within acceptable limits and provide long meter life.

The following Table 1 provides a guide for acceptable meter types and sizes for a range of uses and flows.

Table 1: Meter Flow Ranges

WATER USE	LAND USE	SIZE		ACCEPTABLE	Flow (L/s)	
		mm	in	METER TYPE	Operating Range	Maximum Continuous
Domestic	Commercial	16	5/8	Displacement	0.032 - 1.26	1.26
	Institutional	19	3/4	Displacement	0.047 - 1.89	1.89
	Industrial	25	1	Displacement	0.063 - 3.16	3.16
		38	1 1/2	Displacement*	0.032 - 6.31	6.31
		50	2	Displacement*	0.032 - 12.62	12.62
		75	3	Compound	0.032 - 28.39	28.39
		100	4	Compound	0.063 - 63.09	63.09
		150	6	Compound	0.095 - 126.18	126.18
		200	8	Compound	0.252 - 170.34	170.34
		250	10	Compound	0.316 - 252.36	252.36
Irrigation/ Bulk Water Use	Agricultural Golf Courses Parks Some Industrial Uses	38	1 1/2	Turbine	0.079-12.62	10.09
		50	2	Turbine	0.095-15.77	12.62
		75	3	Turbine	0.158-41.01	31.55
		100	4	Turbine	0.189-78.86	63.09
		150	6	Turbine	0.252-157.73	126.18
		200	8	Turbine	0.316-220.82	220.82
		250	10	Turbine	0.379-347.00	347.00

* *Displacement refers to Positive displacement meter type or approved equal*

Conversion Factors: l/sec to USGPM multiply by 15.850
L/sec to IGPM multiply by 13.198

8. Dedicated Fire Services

Fire service connections are to be metered to detect unauthorized use. Provide all fire services with a double detector check valve in combination with an appropriately sized “tattle-tale” positive displacement radio type meter and double check valve on a bypass. Install “tattle-tale” meters in accordance with these specifications.

9. Combined Fire Domestic Services

All new water service connections to the municipal water system shall have a separate fire line and domestic service pipe, unless approved otherwise by the City.

Where the City approves the use of a combined domestic and fire service, an FM approved ULC listed meter assembly shall be installed to measure all flows. The meter assembly shall include a strainer, check valve, an approved type meter and a smaller approved domestic meter on a bypass. The meter set shall be factory assembled. All meters must be radio type as per this specifications.

Acceptable preassembled fire meter sets are:

- Neptune HP Protectus III, coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver
- Sensus OMNI F^2 (FireLine) with check valve and smaller (domestic) meter on a bypass and coupled with 510M (non-pit) / 520M (pit) or equivalent* radio transceiver.
- Neptune C&I Mach 10 meter coupled with 510 DP/520 DP wired or touch (3-wire) **(use of this meter to be approved by the City)**

** Equivalent means the radio transceiver unit that is compatible with City's current AMI system.*

10. Installation Requirements

Installation requirements are summarized on the following Table 2 and illustrated on the appended typical installation drawings.

Table 2: Installation Requirements

Size mm	Type	By Pass*		Strainer Required	Strainer Type	Chamber		
		Required	Size			Type	Size mm	Model
16x19	Displacement	No	-	No	-	Meter Box	300x500	Brooks 37
19-25	Displacement	No	-	No	-	Meter Box	425x750	Brooks 66
38-50	Displacement	Yes	25 mm	No	-	Meter Box	560x860	AEC 5686
75	Compound	Yes	50 mm	Yes	Straight	Vault	1200x2000	AEC 2121
100	Compound	Yes	50 mm	Yes	Straight	Vault	3260x1760	AEC 3151
150	Compound	Yes	50 mm	Yes	Straight	Vault	3260x1760	AEC 3151
150	Combined	Yes	50mm	Yes	FM/UL	Vault	3260x1760	AEC 3151
100-150	Detector Check /Fire	No	-	No	-	Vault	1200x2000	AEC 2121
200	Detector Check /Fire	No	-	No	-	Vault	3260x1760	AEC 3151

** A bypass is not required for dedicated irrigation meters.*

The applicant's Engineer must design installations for meters not shown on the above table.

Installation and Piping Requirements:
Install meters horizontally with register casings plumb, facing upward. Where installed in a meter box, center meter in box.

All connecting piping, valves and fittings shall be equal to the diameter of the meter for a distance of at least 5 pipe diameters up and down stream of the meter.

Where required, install strainers immediately upstream of the meter using a flanged connection. Strainers shall be of the same manufacturer and size as the meter. Exceptions must be approved by the City.

Provide isolation valves upstream and downstream of the meter to allow removal of meter and strainer cases. Install a valve on bypass. Provide a lock wing on the operating nut of bypass valves 50mm and smaller.

For all compound and turbine meter installations provide a straight section of horizontal pipe, 5 pipe diameters in length, between the strainer and the upstream isolating valve. Do not install elbows, bends, non-concentric reducers, check valves, backflow preventers and/or pressure reducing valves within 10 pipe diameters upstream or 5 pipe diameters downstream of a meter.

An assembly with a Neptune brand meter without a strainer requires a minimum of 8-pipe-diameters of straight run pipe upstream of the meter.

Provide a test point for all meters 75mm in diameter and larger. In the absence of a test plug on the meter case, install a testing tee with a 50mm diameter threaded nipple and cap, between the meter and the downstream isolating valve.

For meters 75mm in diameter and larger provide a mechanical flange adapter on the downstream side of the meter to provide flexibility for meter and strainer case removal.

Support all meters, valves and bypasses within chambers with adjustable pipe stands. Bricks, concrete or wood blocking are not acceptable means of support.

Vaults and chambers require drain connection to a storm drainage system. Where a gravity connection to the storm system is not available, the City may approve one of the following options:

- Installation of an electric sump pump
- Installation of a rock pit. A Professional Engineer specializing in geotechnical designs must design rock pits
- Installation of a hydraulic sump ejector assembly.

Radio Installation:
The required number of radio transceiver units must be installed according to the manufacturers' specifications. In non-traffic areas mount radio transceiver in the chamber lid in accordance with the manufacturer's instructions. Where the lid is in a traffic area, mount the radio transceiver unit in a meter box cover/lid with recessed-hole that will have the radio transceiver head flushed with the meter box cover/lid or in an adjacent Brooks 37 Box as shown in drawing WM-7.

Remote wiring connections shall be either factory or field sealed to ensure connections are water proof. Field seals shall be in accordance with the manufacturers' instructions. The wire/cable used to connect the meter and the radio transceiver must be supplied by or purchased from the meter manufacturer and has sufficient length, including slack, to be able to open or remove the lid/ hatch without snapping, removing, or separating the wire/cable.

For inside meter installations, where approved by the City, locate wall mounted radio transceivers about 1.6 metres above grade in clearly accessible location. Wiring radio transceiver to outside building and wall installation must comply to manufacturers' specifications.

11. Materials

Pipe

Copper Pipe: Copper pipe to be Certified Type K soft copper to ASTM B 88m.

All copper tubing joints are to be compression type or Victualic. Acceptable compression fittings are McDonald "T", James Jones "Super Grip", Ford "Quick Joint" or Mueller "110". Soldered joints are not permitted

Red Brass Pipe: Red Brass pipe to meet AWWA C-800.

Red brass joints to be threaded to ANSI B1.20.1.

Steel Pipe: Steel pipe is to meet AWWA C-200, electrically welded. Steel to ASTM A36. Epoxy coat the interior and exterior of all steel pipe and fabrications to AWWA C-210 or AWWA C-213.

Steel pipe joints are to be flanged to AWWA C-208 or made with mechanical couplers, mechanical flange adapters, and "Uniflange" or "EZ Flange" style adapters.

Stainless Steel Pipe: Stainless steel pipe is to be Schedule 10S, dual certified 304 series stainless steel.

Grooved ends to be roll grooved per Victaulic Standard Groove specifications.

Fittings

Brass: Brass fittings to 75mm to meet AWWA C-800. All fitting joints to be compression type, threaded to ANSI B1.20.1, flanged or Victualic. Acceptable compression fittings are specified in the latest edition of the City's MMCD supplemental specifications and approved products list.

Steel: Steel fittings are acceptable in sizes 75mm and larger. Fabricated steel fittings to meet AWWA C-208 and AWWA C-207. Epoxy coat steel fittings to AWWA 210 or AWWA-213. All fitting connections shall be shop welded, flanged or Victualic. Flange dimensions and drilling are to be ANSI B16.1

Stainless Steel: Welded stainless steel fittings to be Class 150 weld-neck or slip-on type with continuous weld.

All grooved fittings to be Schedule 10S, 304 series stainless steel. Couplings to be Victaulic Style 489.

Valves

All valves are to be suitable for buried service. Valves on domestic service connections up to 50mm in diameter shall be bronze ball or cylinder corporation style valves meeting AWWA C-800. Valves shall have rubber o-ring seals. Connections shall be threaded, compression type or flanged. Actuation is to be by a tee-head style operating nut. Provide a lock wing on the tee-head and case for all bypass valves (locking mechanisms on levers are not acceptable).

Valves on domestic service connections 75mm to 250mm in diameter are to be cast iron, resilient seat, NRS gate valves to AWWA C-509 with flanged ends. Stem seal to be o-ring type. Actuation of buried valves or valves in vaults shall be by a standard 50mm square operating nut. Valves within person entry chambers shall be operated by hand wheel.

Provide a Nelson style valve box over buried valves.

Fire service valves within vaults or chambers shall be resilient seat, OS&Y gate valves to AWWA 509.

Detector Check Valves

Double detector check valves are to comply with AWWA C-510. Detector check valves for fire service use must be FM approved and ULC listed.

Flange Adapters

Mechanical Flange adapters for 50mm to 200mm sizes shall be to AWWA C219.

Connections between flanged fittings and steel piping may be made with “Uni-flange” or “EZ-flange” adapters.

Bolts and Nuts

Bolts and nuts are to be stainless steel to ASTM F-593 and F-594. Rolled threads, fit and dimension to AWWA C-111.

Meter Setters

Setters are permitted only for water meters 50 mm or smaller and must be same size as the water service connection.

For 19 mm and 25 mm services, setters must be equipped with a full port inlet ball valve and dual check valve on outlet.

For 38 mm and 50 mm services, the setter shall be equipped with a full port inlet ball valve and full port outlet ball valve to facilitate in-situ testing of the meter. Further, the setter shall have a bypass valve with a lock wing.

All setters must meet NSF 61 Annex F/G requirements.

Meter Boxes

The box, vault or chamber shall be precasted concrete to the dimensions provided in Table 3. Vaults shall be design for boulevard (off road) use with static H-20 loading. Chambers shall be designed for roadway use with H-20 loading or deep installations. The minimum headroom for chambers shall be 1.9 meters for worker entry.

Boxes shall have galvanized steel or aluminum lids capable of withstanding H-20 static loads (for off road). Lids shall include a “bolt down” capability. Cast iron lids require City approval.

Vaults sized 1200 x 2000 shall have two hinged aluminum lids providing an 800mm x 1700mm opening. Vaults sized 1760 x 3260 shall have three hinged aluminum lids providing an 820mm x 2590mm opening. Vault lids shall be capable of withstanding H-20 static loading. Lids shall include a “bolt down” capability.

Lids for chambers shall be 1200mm x 1200mm square split hinged aluminum. Chamber lids shall be capable of withstanding H-20 loading. Lids shall include a “bolt down” capability.

Lids for boxes, vaults and chambers shall be predrilled and with a recessed hole for transceiver unit installation. Where this is not feasible follow drawing WM-7.

Where the depth from the top of the lid frame to the chamber floor exceeds 0.6 meters, provide an aluminum ladder securely fastened to the chamber floor and wall. Ladders shall have a telescoping aluminum post fixed to the ladder to enable safe worker entry or exit (Bilco LadderUP Safety Post LU4 or approved equal). The access hatch must be sized for a worker to enter or exit with confined space gear/clothing.

Damp proof the exterior surfaces of all vaults and chambers by applying an asphalt emulsion coating. Make construction joints water tight with an appropriate sealant.

An area of at least 1.0 metre horizontal around the meter box, vault or chamber shall be free of major landscaping or objects, including shrubs, trees, retaining or other types of walls, fences, gates, tracks, poles, etc., to facilitate maintenance of the meter assembly.

Where the meter is approved by the City to be installed within a building / utility room, the installation should be within a reasonable distance of a floor drain, which must be suitably sized to accept the flows associated with meter testing and/or maintenance. The meter should be installed a minimum of 600 mm above the floor. A space of at least 1.0 metre horizontal and 1.0 metre vertical from the meter assembly shall be free of obstruction to allow for convenient servicing / maintenance and testing of the meter. No electrical, mechanical, or water-sensitive equipment should be placed or installed under the meter assembly or in an area where splash or flow from the meter assembly could occur during servicing / maintenance or testing of the meter.

Acceptable boxes, vaults and chambers are listed in Table 3 below:

Table 3: Meter chambers

Type	Size (mm)	Model*	Lid / Hatch Size (mm)
Boxes	300x500	Brooks 37	300x450 galv. steel (cast iron with City approval)
	425x750	Brooks 66	450x750 galv. Steel (cast iron with City approval)
	560x860	AE Concrete 5686	630x940 aluminum
Vaults	1200x2000	AE Concrete 2121	2 – 880x880 aluminum
	1760x3260	AE Concrete 3151	3 – 880x880 aluminum
Chambers	1760x3260	AE Concrete 3152	2 – 600x1200 aluminum

** Specified or equivalent product*

12. Inspection Procedure

A request for water service connection is initiated by an application for a Plumbing Permit through the City's Development Services Department.

The Applicant's Engineer shall determine from the City whether the service connection requires a meter and shall select the appropriate meter type for the intended use in accordance with the City's Water Meter Specifications. Plans submitted as part of the Plumbing Permit Application must indicate the meter size, type and chamber location. The plans shall also indicate the expected range of flows and the average expected flow for the proposed installation.

For non-typical meter installations, or for meters of 200mm diameter and larger, the applicant's Engineer must provide detailed drawings giving complete details of the installation.

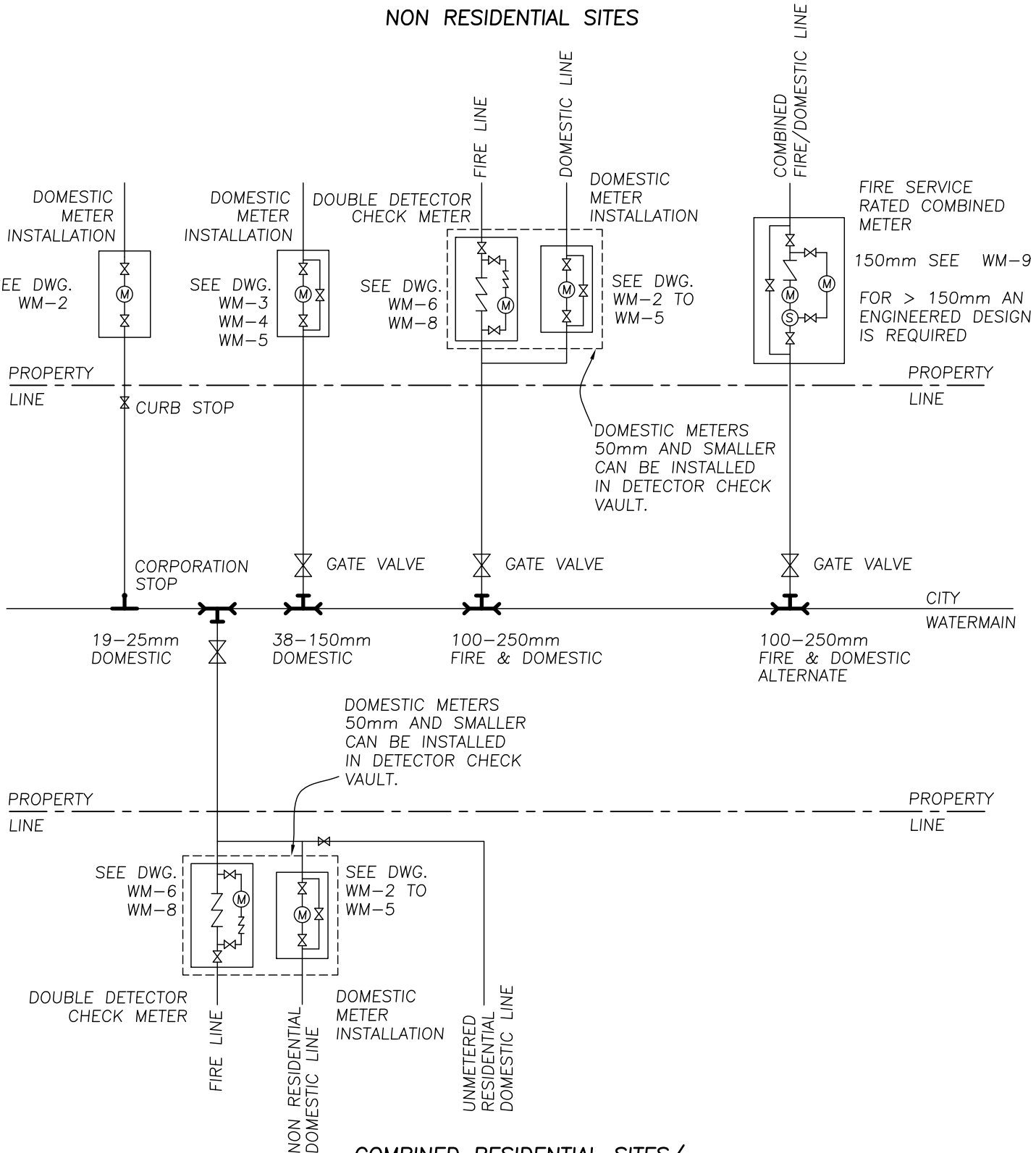
The City Development Services Department will inspect the meter installation to ensure conformance to this specification and the B.C. Plumbing Code.

Upon approval of the installation by the Plumbing Inspector, the developer is to call the City Engineering and Public Works Department at 604-927-3500 to lock the bypass valve where applicable, take the initial meter reading and activate the service connection. All factory tags and labels are to remain on the meter until the City Public Works department removes them.

13. Water Service During Construction

Water service connections required during construction phase of a development project generally be unmetered per the latest applicable *Water Distribution Amendment Bylaw*, however at the discretion of the City a meter may be required. Meters installed on such service connections are to conform to the requirements of this specifications – unless variations approved by the City - and the meter to be in place prior to the activation of the service. Only City Engineering Department personnel may deactivate such a service or remove the meter. Contact the City Engineering Customer Service Desk at 604-927-3500.

Water Meter Specifications
Typical Installation Drawings



PLOTTED: 1-Dec-21

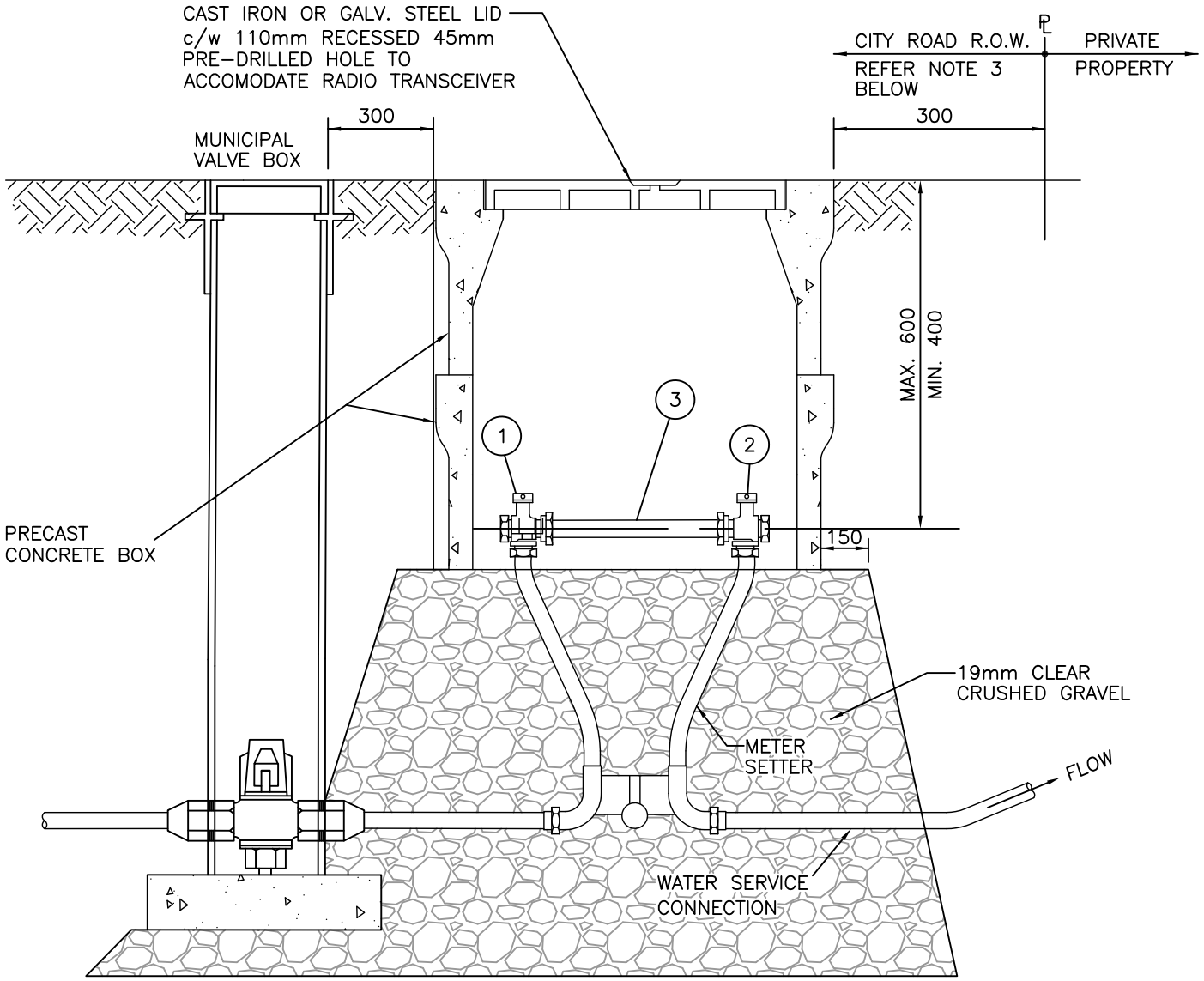
TYPICAL SERVICE INSTALLATION

DATE:	DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: WM-1

Coquitlam

STANDARD DETAIL DRAWINGS



SECTION

METER BOXES			
16 mm	METER	–	BROOKS 37
16x19 mm	METER	–	BROOKS 37
19 mm	METER	–	BROOKS 66
25 mm	METER	–	BROOKS 66

No.	DESCRIPTION
1	INLET BALL VALVE (FULL PORT)
2	DUAL CHECK VALVE (IN SETTER)
3	TYPE K COPPER SPOOL PIECE IN PLACE OF METER

NOTES:

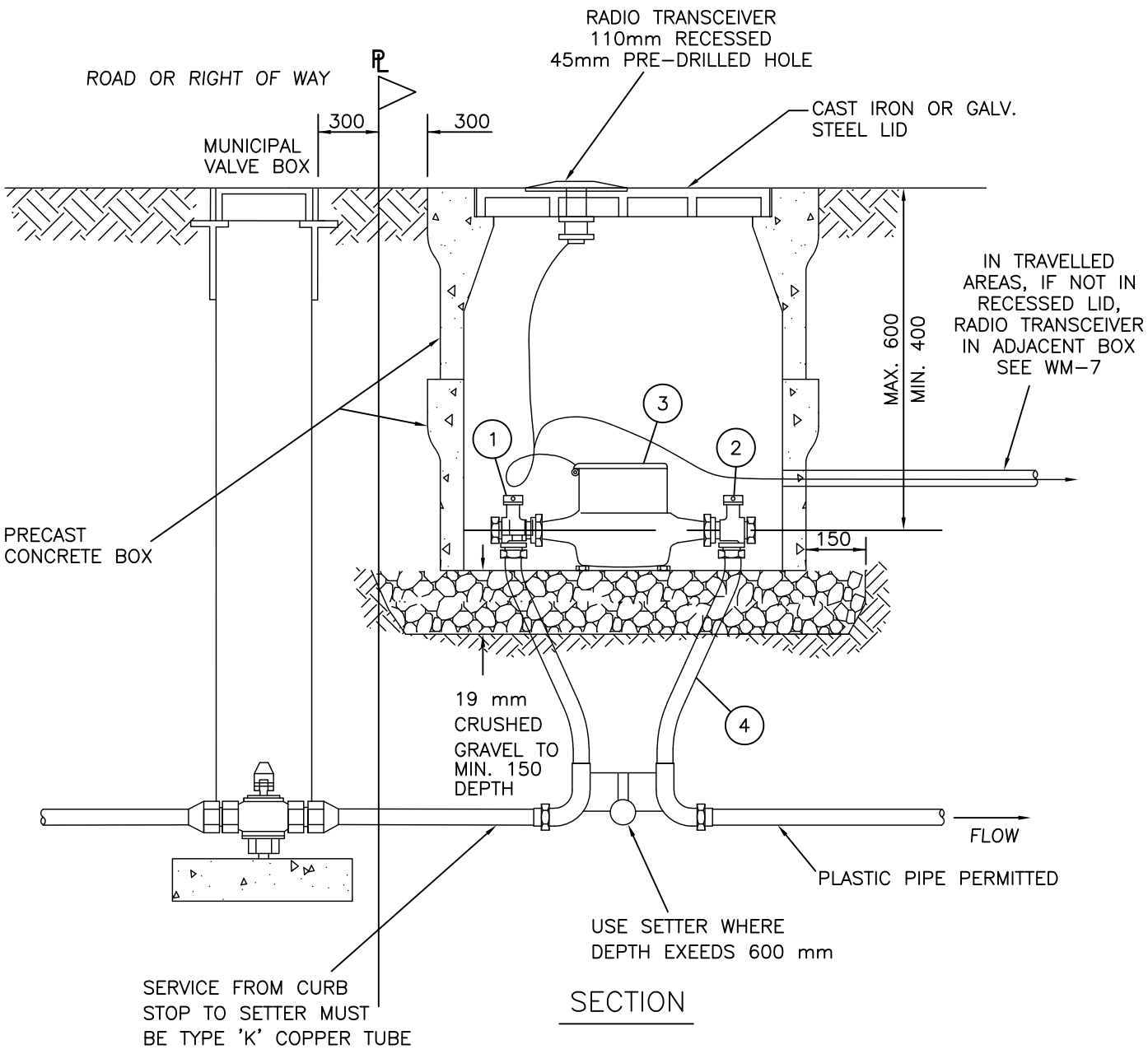
1. THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.
2. REFER TO SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
3. METER SETTER TO BE LOCATED ON PRIVATE PROPERTY (300mm FROM PROPERTY LINE) IF BEING INSTALLED AS PART OF A DEVELOPMENT.

16mmø - 25mmø METER SETTER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

COQ-W2m



SECTION

METER BOXES			
16 mm	METER	–	BROOKS 37
16x19 mm	METER	–	BROOKS 37
19 mm	METER	–	BROOKS 66
25 mm	METER	–	BROOKS 66

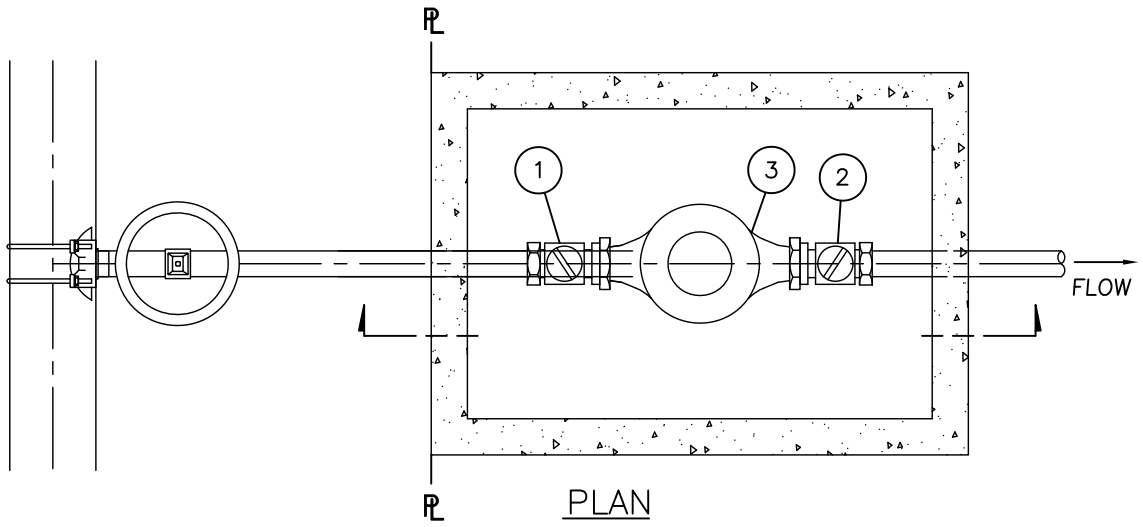
No.	DESCRIPTION
1	INLET BALL VALVE (FULL PORT)
2	DUAL CHECK VALVE (IN SETTER)
3	APPROVED METER
4	APPROVED METER SETTER

Note: This drawing should be reviewed with water meter specifications document.

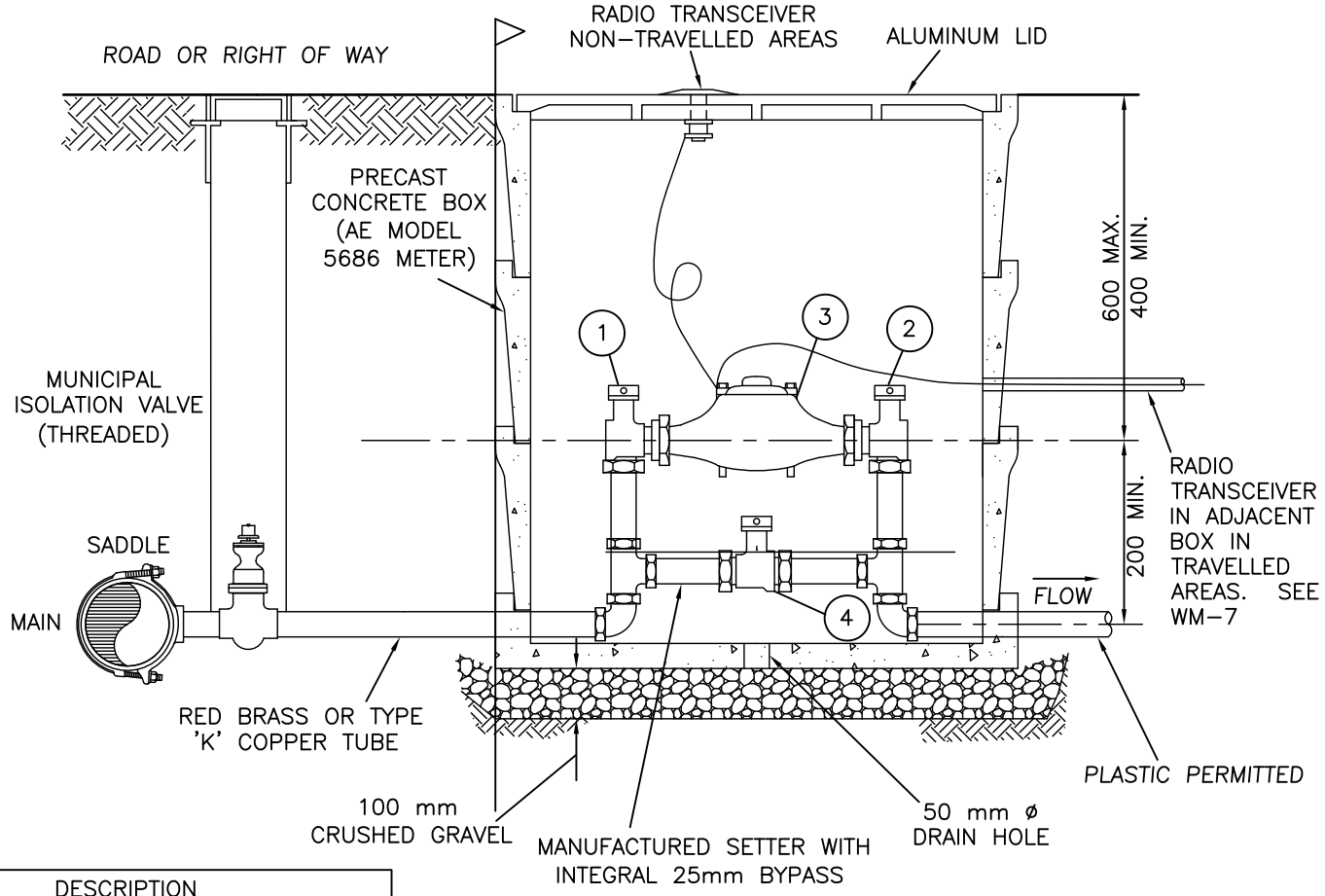
16mmø – 25mmø POSITIVE DISPLACEMENT METER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: WM-2



PLAN



SECTION

No.	DESCRIPTION
1	STOP WITH LOCKWING
2	DOWNSTREAM STOP
3	METER
4	BYPASS STOP WITH LOCKWING

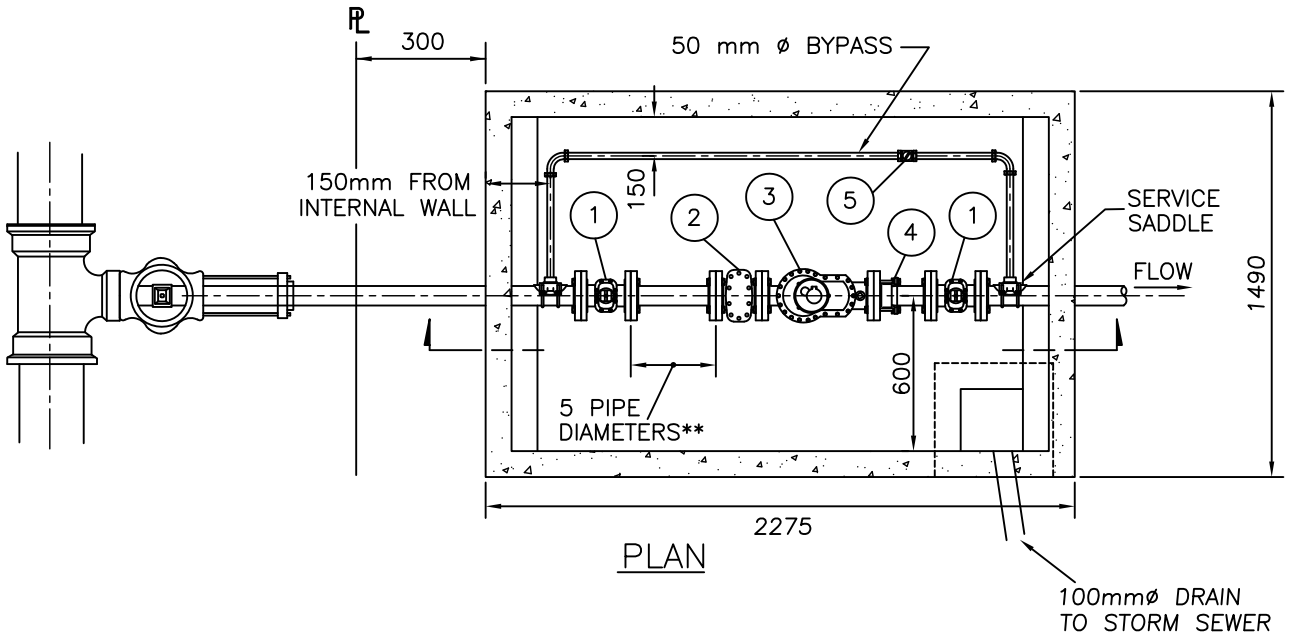
NOTES:
ALL FIELD JOINTS TO BE THREADED OR COMPRESSION.
ALL PIPE TO BE BRASS OR COPPER TUBE.
MANUFACTURED SETTERS MAY HAVE SOLDERED JOINTS.

PLOTTED: 1-Dec-21

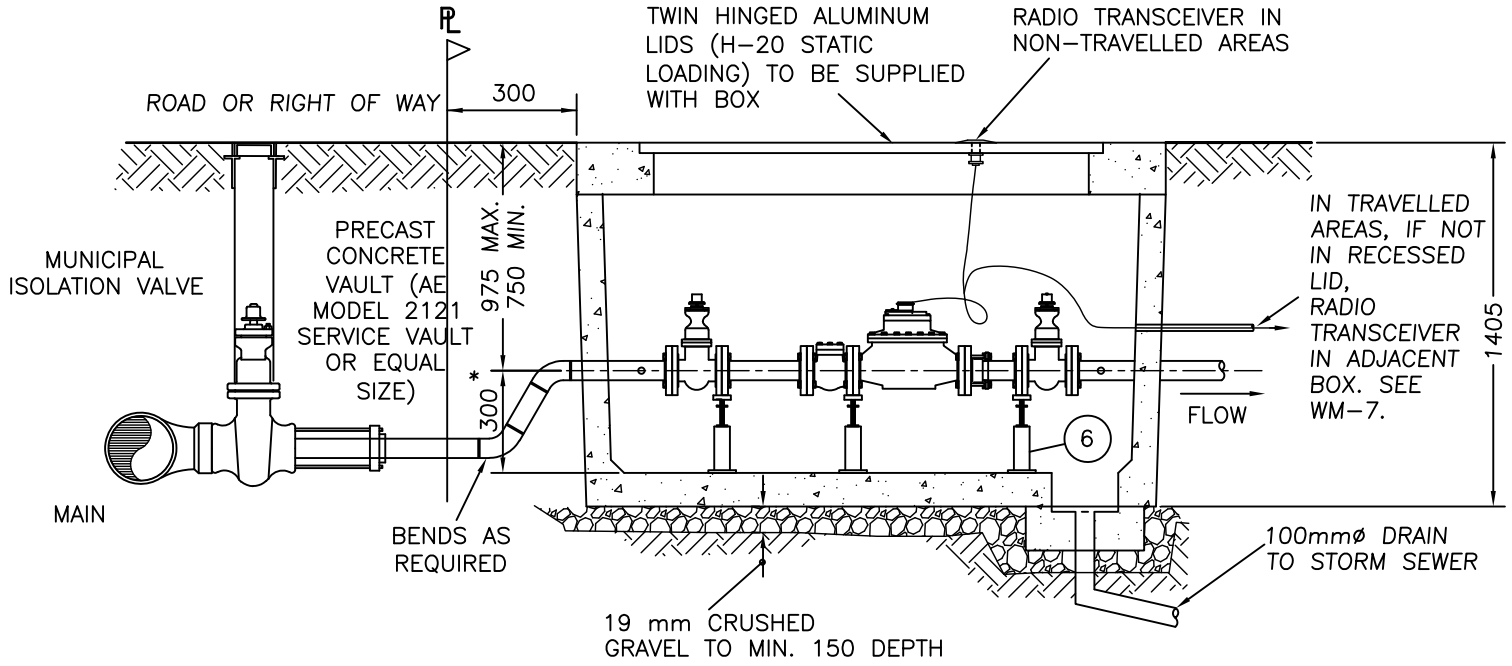
38mmø – 50mmø POSITIVE DISPLACEMENT METER INSTALLATION

DATE:	DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: WM-3



PLAN



SECTION

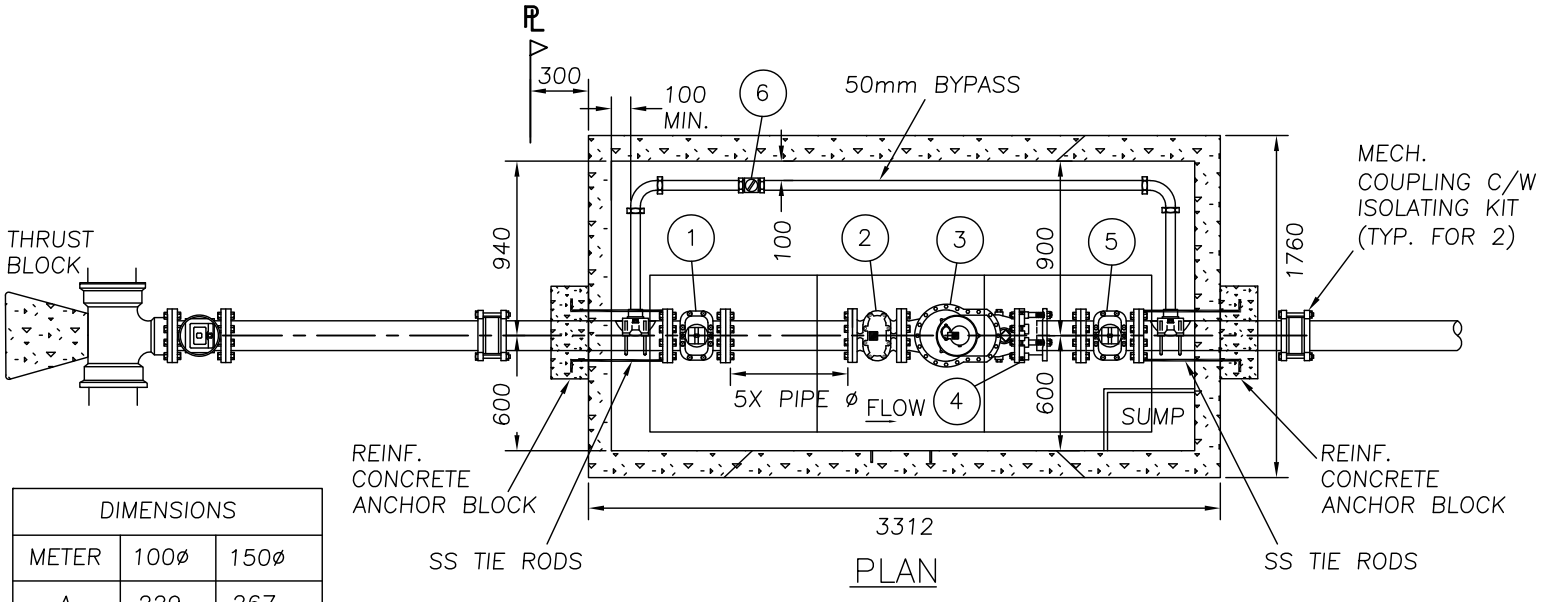
NOTES:
1. *THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.*
2. *PIPE TO BE TYPE K COPPER, BRASS, EPOXY COATED WELDED STEEL OR SS.*
3. *REFER DISTANCES IN WATER METER SPECIFICATIONS DOCUMENT.*
4. *CONNECTIONS:*
   BRASS: IPT
   COPPER: COMPRESSION OR VICTAULIC. NO SOLDER PERMITTED
   STEEL: FLANGED, "UNIFLANGE", OR "EZ FLANGE" OR VICTAULIC

No.	DESCRIPTION
1	GATE VALVE (ISOLATION)
2	STRAINER
3	APPROVED METER
4	MECHANICAL FLANGE ADAPTOR
5	BYPASS BALL VALVE WITH LOCKWING
6	ADJUSTABLE PIPE STANDS

75mmø COMPOUND METER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

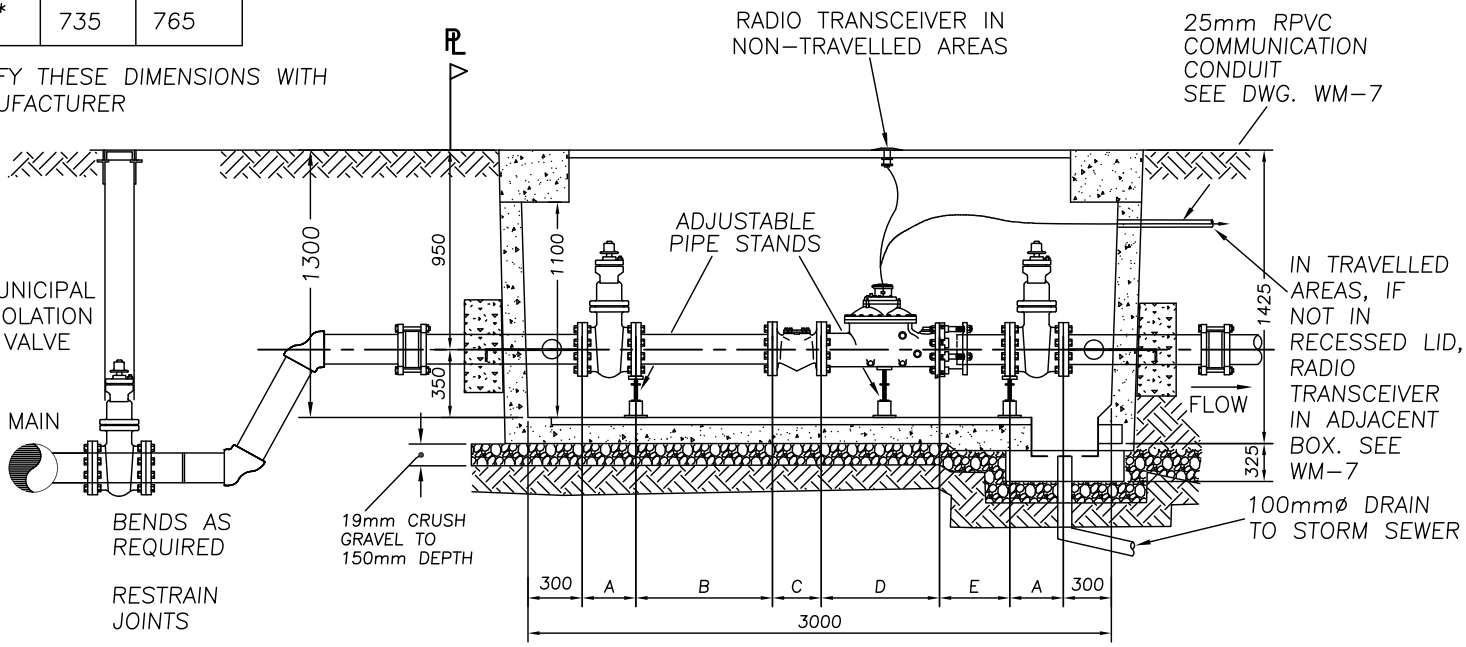
DRAWING NUMBER: **WM–4**



PLAN

DIMENSIONS		
METER	100ø	150ø
A	229	267
B	508	762
C*	191	229
D*	508	610
E*	735	765

* VERIFY THESE DIMENSIONS WITH MANUFACTURER



SECTION

NOTES:
PIPE: TO BE TYPE K COPPER, BRASS, EPOXY COATED WELDED STEEL OR SS.

CONNECTIONS:
BRASS: IPT
COPPER: COMPRESSION OR VICTAULIC. NO SOLDER PERMITTED
STEEL: FLANGED, "UNIFLANGE", "EZ FLANGE" OR VICTAULIC

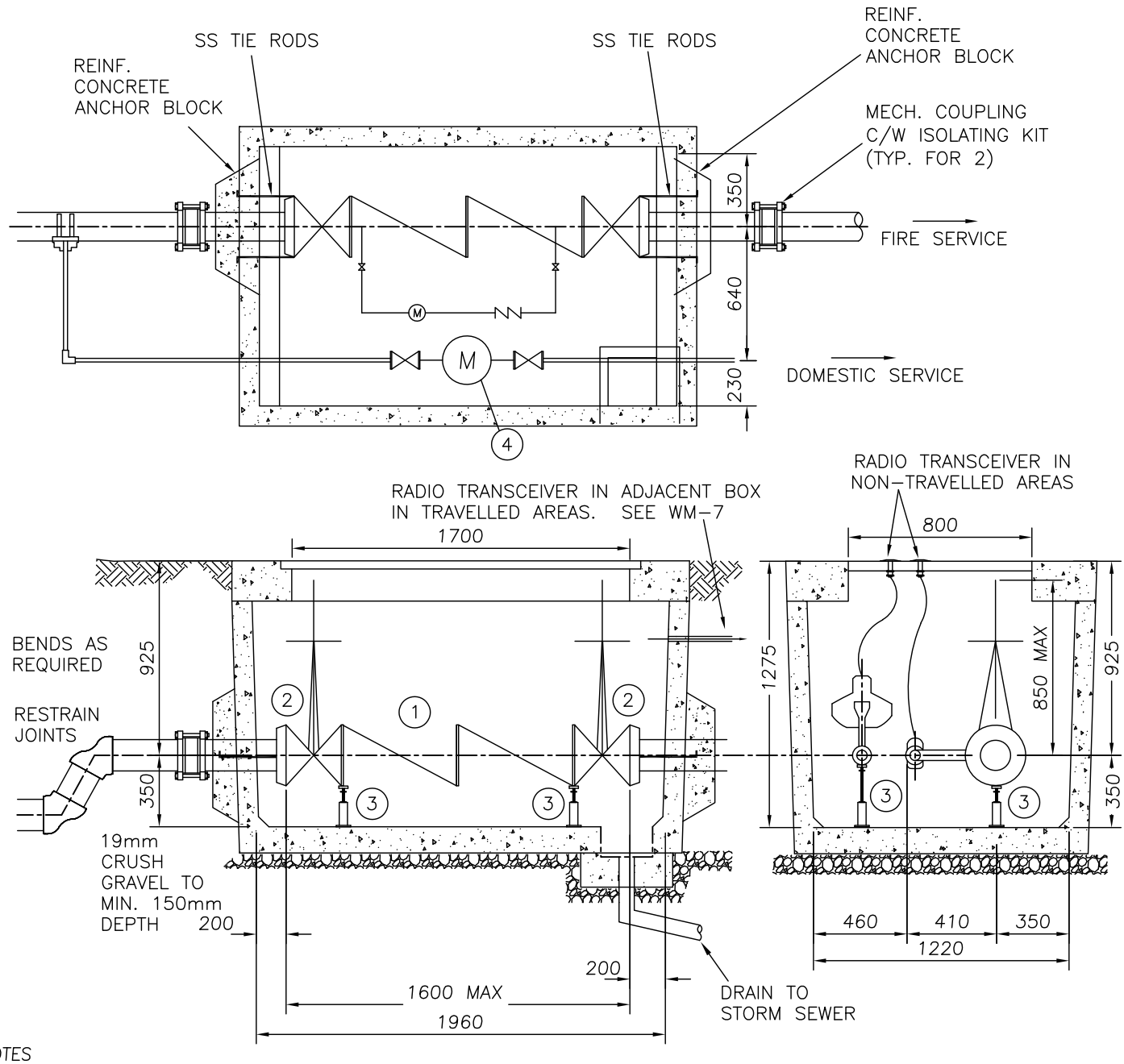
CHAMBER:
AE CONCRETE MODEL 3151 VAULT OR EQUAL SIZE

No.	DESCRIPTION
1	UPSTREAM RESILENT SEAT GATE VALVE
2	STRAINER
3	APPROVED METER
4	MECHANICAL FLANGE ADAPTOR
5	DOWNSTREAM RESILENT SEAT GATE VALVE
6	BYPASS BALL VALVE WITH LOCKWING

100mmø – 150mmø COMPOUND METER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: WM-5



NOTES

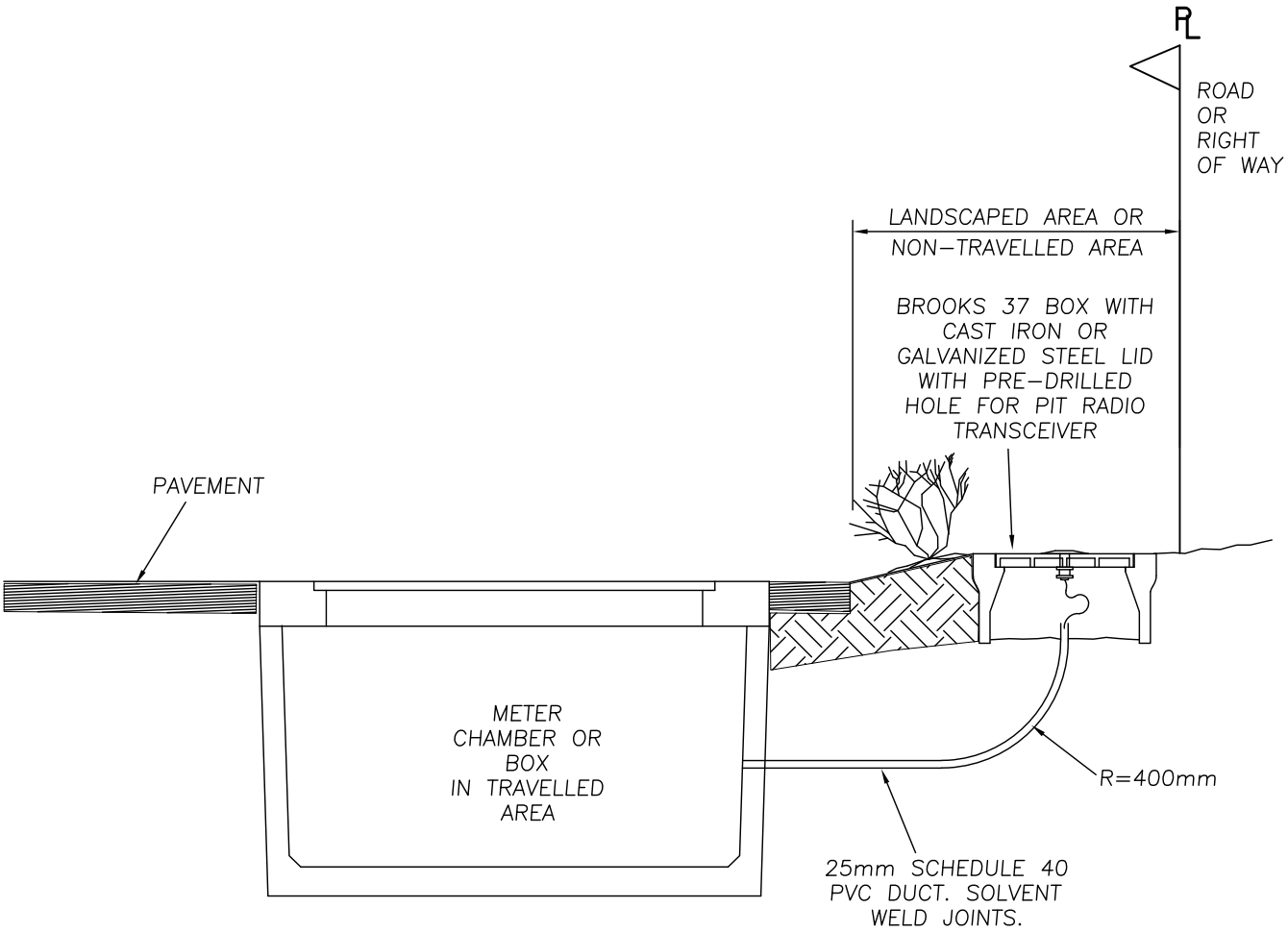
1. *THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.*
2. *PIPE: TO BE TYPE K COPPER, BRASS, EPOXY COATED WELDED STEEL OR SS.*
3. *CONNECTIONS:*
   BRASS: IPT
   COPPER: COMPRESSION OR VICTAULIC. NO SOLDER PERMITTED
   STEEL: FLANGED, "UNIFLANGE", "EZ FLANGE" OR VICTAULIC
4. *AS PER BC BUILDING CODE 3.2.4.9.1), 2) & 3), VALVE HANDWHEELS CONTROLLING THE FIRE WATER SERVICE SHALL BE ELECTRICALLY SUPERVISED AND MONITORED.*
5. *VAULT: AE CONCRETE MODEL 2121 OR EQUAL SIZE*

No.	DESCRIPTION
1	*FM APPROVED ULC LISTED DOUBLE DETECTOR CHECK ASSEMBLY CW 2 OS & Y GATE VALVES, TEST COCKS, APPROVED METER AND BY PASS.*
2	*"UNIFLANGE" OR "MEGA LUG" FLANGE ADAPTORS.*
3	*ADJUSTABLE PIPE STANDS.*
4	*50mm AND SMALLER DOMESTIC METER. METERS > 50mm REQUIRE SEPARATE VAULT.*

SEPARATE DOMESTIC METER AND 100mm – 150mm FIRE SERVICE WITH DOUBLE DETECTOR CHECK VALVE INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: **WM-6**

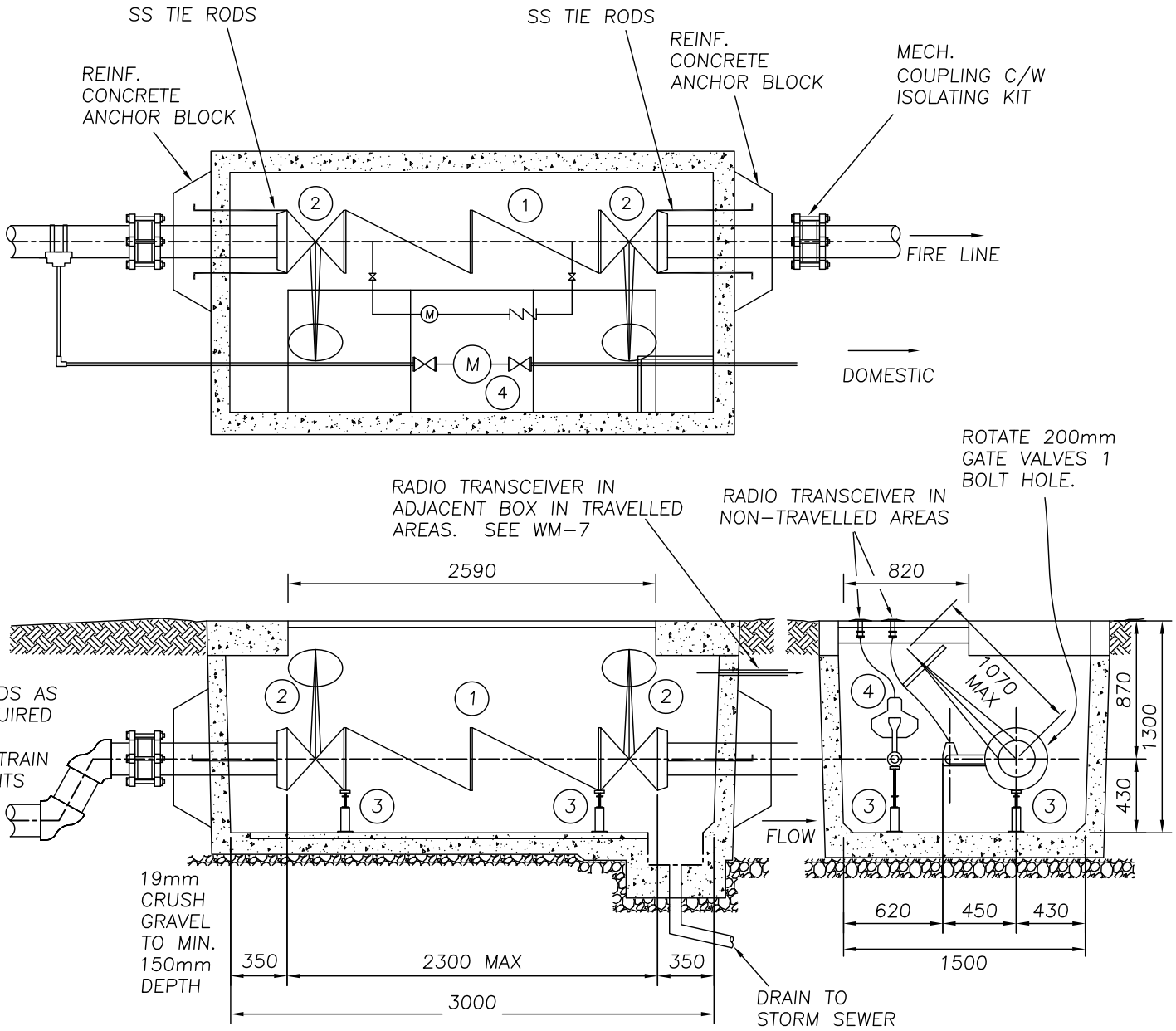


PIT RADIO TRANSCEIVER INSTALLATION IN TRAVELLED AREAS

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

WM–7



NOTES

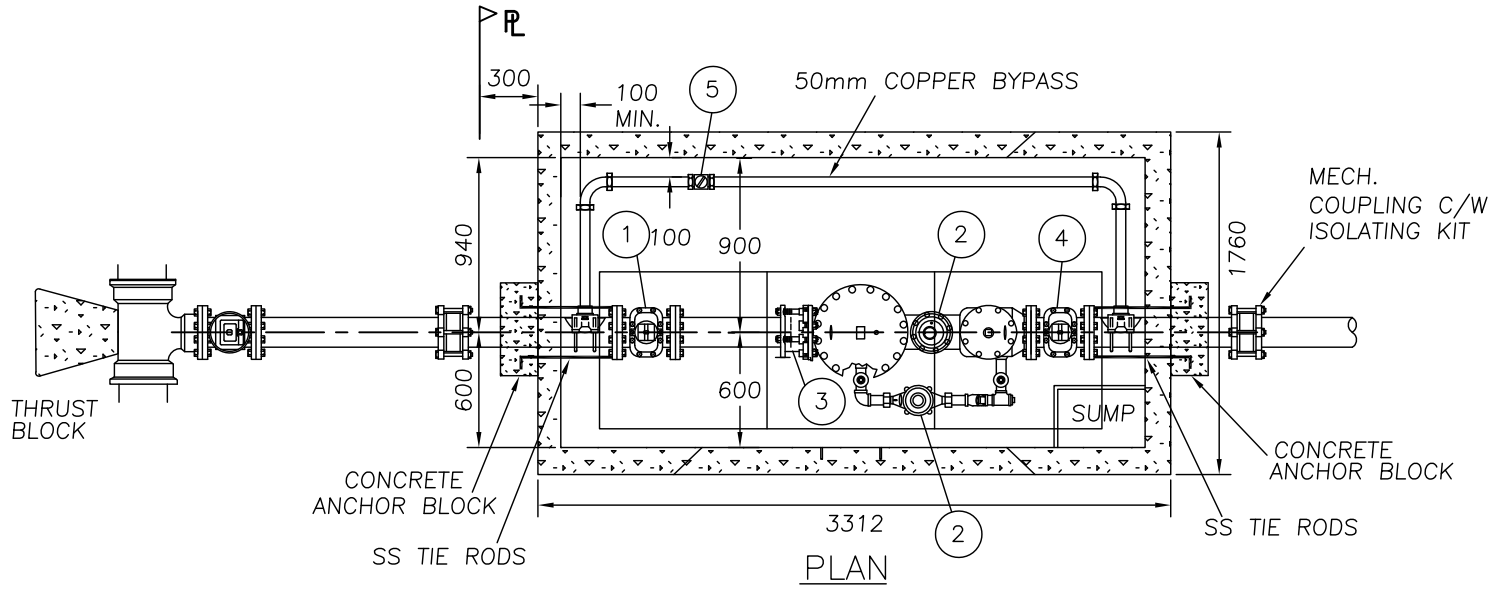
1. THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.
2. PIPE: TO BE TYPE K COPPER, BRASS, EPOXY COATED WELDED STEEL OR SS.
3. CONNECTIONS:
   BRASS: IPT
   COPPER: COMPRESSION OR VICTAULIC. NO SOLDER PERMITTED
   STEEL: FLANGED, "UNIFLANGE", "EZ FLANGE" OR VICTAULIC
4. AS PER BC BUILDING CODE 3.2.4.9.1), 2) & 3), VALVE HANDWHEELS CONTROLLING THE FIRE WATER SERVICE SHALL BE ELECTRICALLY SUPERVISED AND MONITORED.
5. VAULT: AE CONCRETE MODEL 2121 OR EQUAL SIZE

No.	DESCRIPTION
1	FM APPROVED ULC LISTED DOUBLE DETECTOR CHECK ASSEMBLY C/W 2 OS & Y GATE VALVES, TEST COCKS, APPROVED METER AND BY PASS.
2	"UNIFLANGE" OR "MEGA LUG" FLANGE ADAPTORS.
3	ADJUSTABLE PIPE STANDS.
4	DOMESTIC METERS 50mm WITH LOW BYPASS SETTER. METERS > 50mm REQUIRE SEPARATE VAULT.

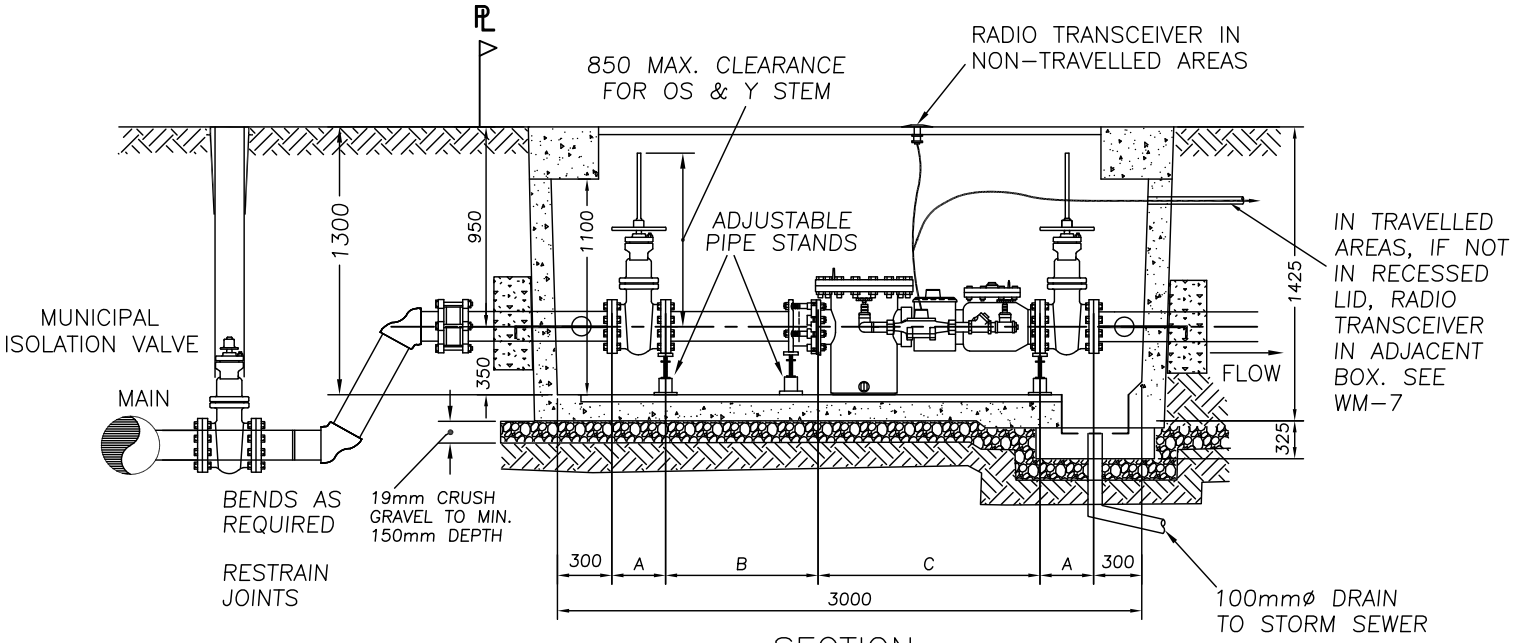
SEPARATE FIRE/DOMESTIC LINES METER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER: WM-8



PLAN



SECTION

No.	DESCRIPTION
1	UPSTREAM RESILENT SEAT GATE VALVE (OS & Y)
2	APPROVED FIRE SERVICE METER
3	MECHANICAL FLANGE ADAPTOR
4	DOWNSTREAM RESILENT SEAT GATE VALVE (OS & Y)
5	BYPASS BALL VALVE WITH LOCKWING

DIMENSIONS	
METER	150ø
A	267
B	723
C*	1143

* VERIFY THESE DIMENSIONS WITH MANUFACTURER

NOTES
1. THIS DRAWING SHOULD BE REVIEWED WITH WATER METER SPECIFICATIONS DOCUMENT.
2. PIPE: TO BE TYPE K COPPER, BRASS, EPOXY COATED WELDED STEEL OR SS.
3. CONNECTIONS:
   BRASS: IPT
   COPPER: COMPRESSION OR VICTAULIC. NO SOLDER PERMITTED
   STEEL: FLANGED, "UNIFLANGE", "EZ FLANGE" OR VICTAULIC
4. AS PER BC BUILDING CODE 3.2.4.9.1), 2) & 3), VALVE HANDWHEELS CONTROLLING THE FIRE WATER SERVICE SHALL BE ELECTRICALLY SUPERVISED AND MONITORED.
5. VAULT: AE CONCRETE MODEL 2121 OR EQUAL SIZE

150mmø COMBINED FIRE/DOMESTIC METER INSTALLATION

DATE:	01 DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

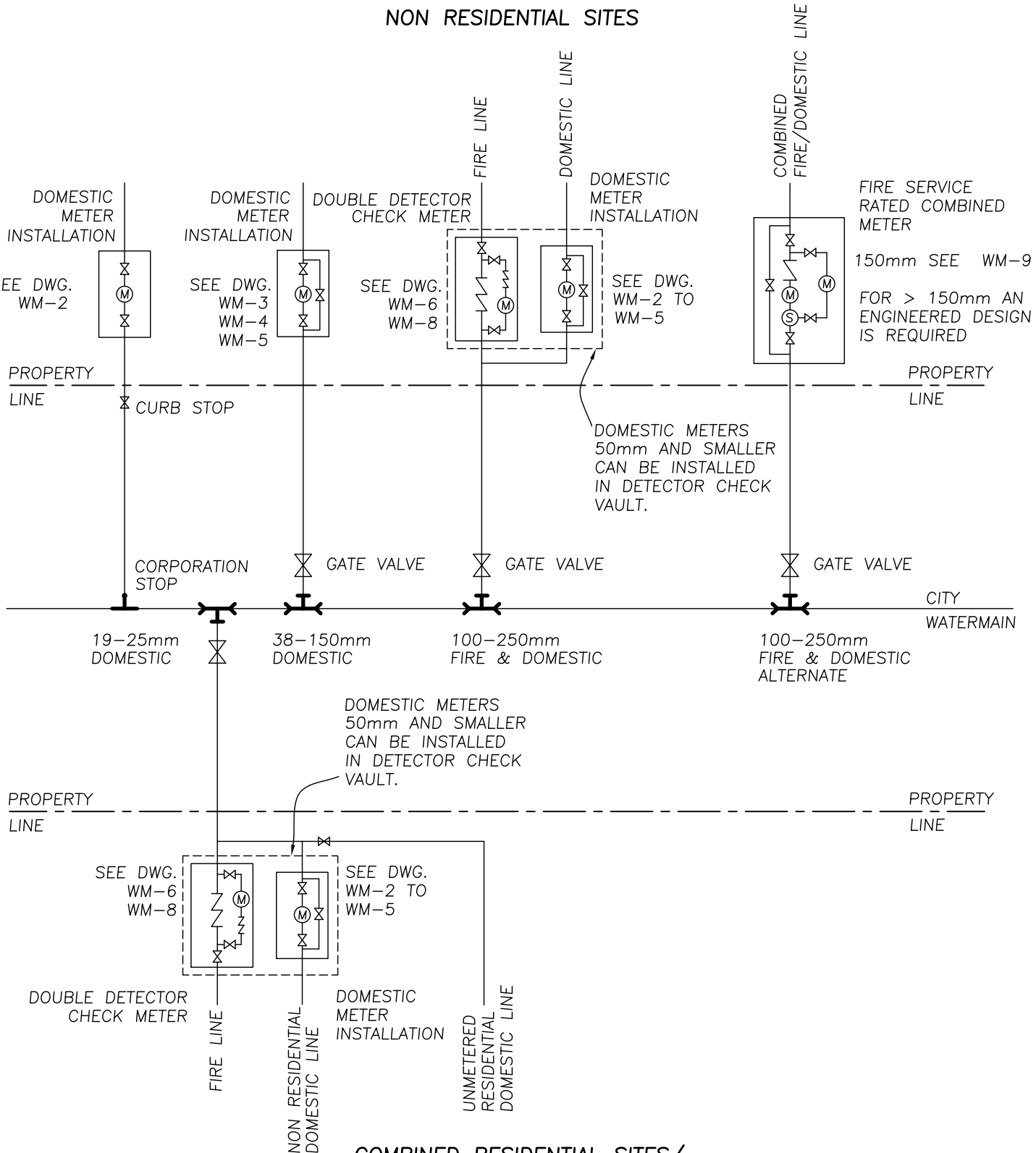
DRAWING NUMBER: **WM-9**

Appendix H -

Standard Detail Drawings & Park Development Standards

Coquitlam

STANDARD DETAIL DRAWINGS



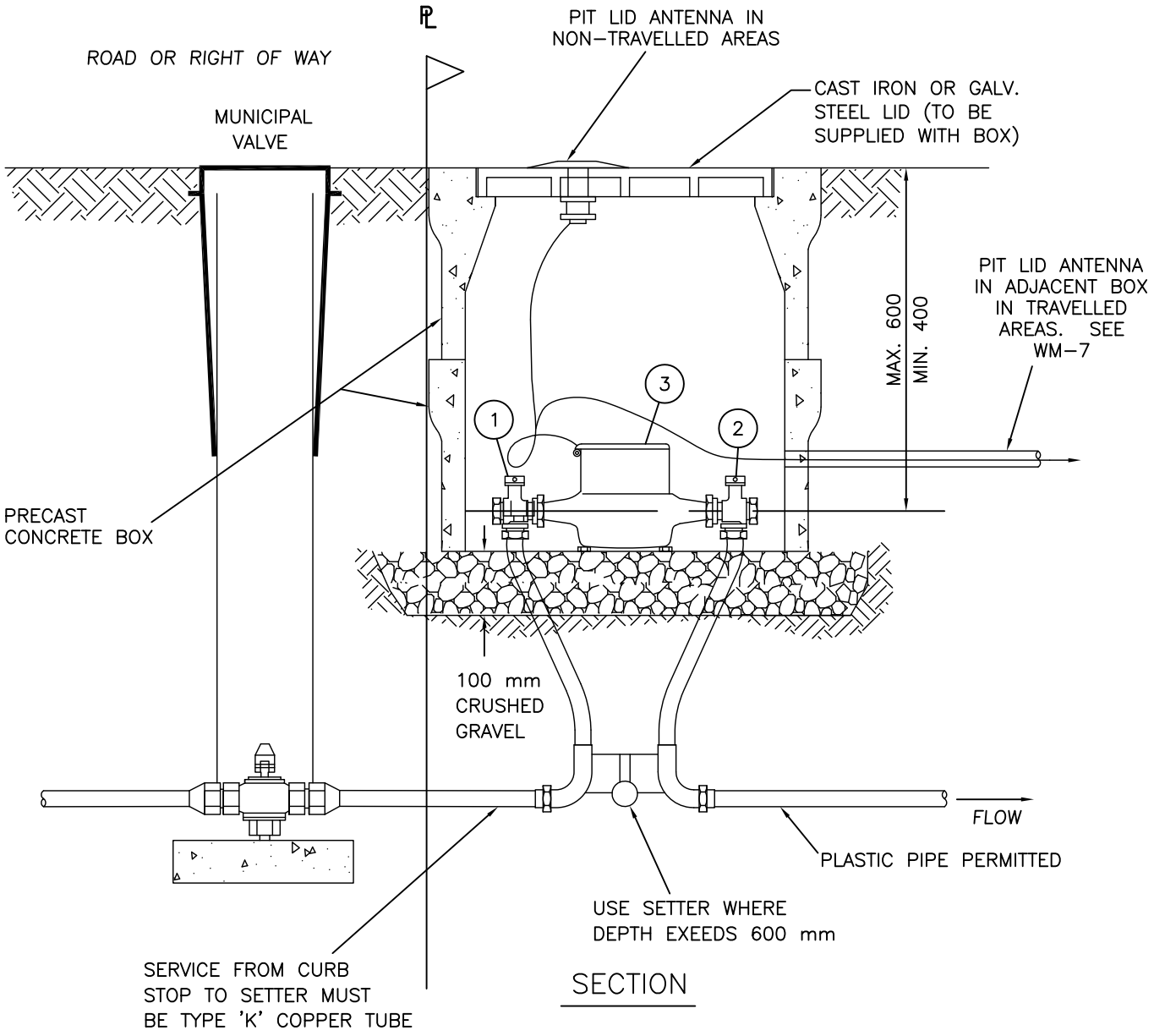
PLOTTED: 1–Dec–21

TYPICAL SERVICE INSTALLATION

DATE:	DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

WM–1



SECTION

BOXES			
16 mm	METER	–	BROOKS 37
16x19 mm	METER	–	BROOKS 37
19 mm	METER	–	BROOKS 66
25 mm	METER	–	BROOKS 66

No.	DESCRIPTION
1	CURB STOP WITH LOCKWING
2	DOWNSTREAM CURB STOP
3	METER, NEPTUNE OR SENSUS

Coquitlam Water Utility

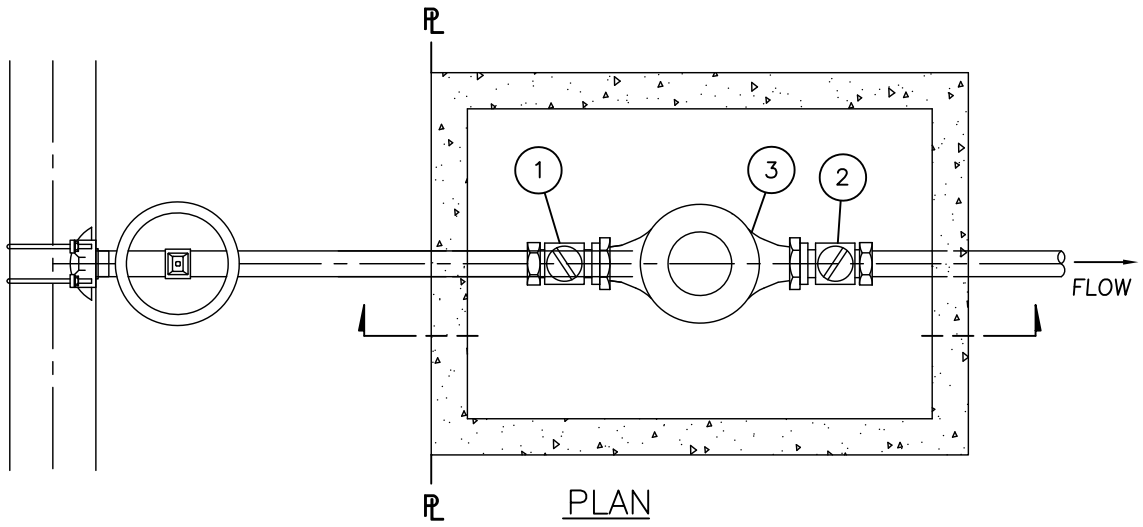
16 mm ø – 25 mm ø DISPLACEMENT METER INSTALLATION

REVISIONS	No.	DATE:	CKD.	APP.
minor text changes	5	07/15	D.K.S.	
minor text changes	4	01/15	D.K.S.	

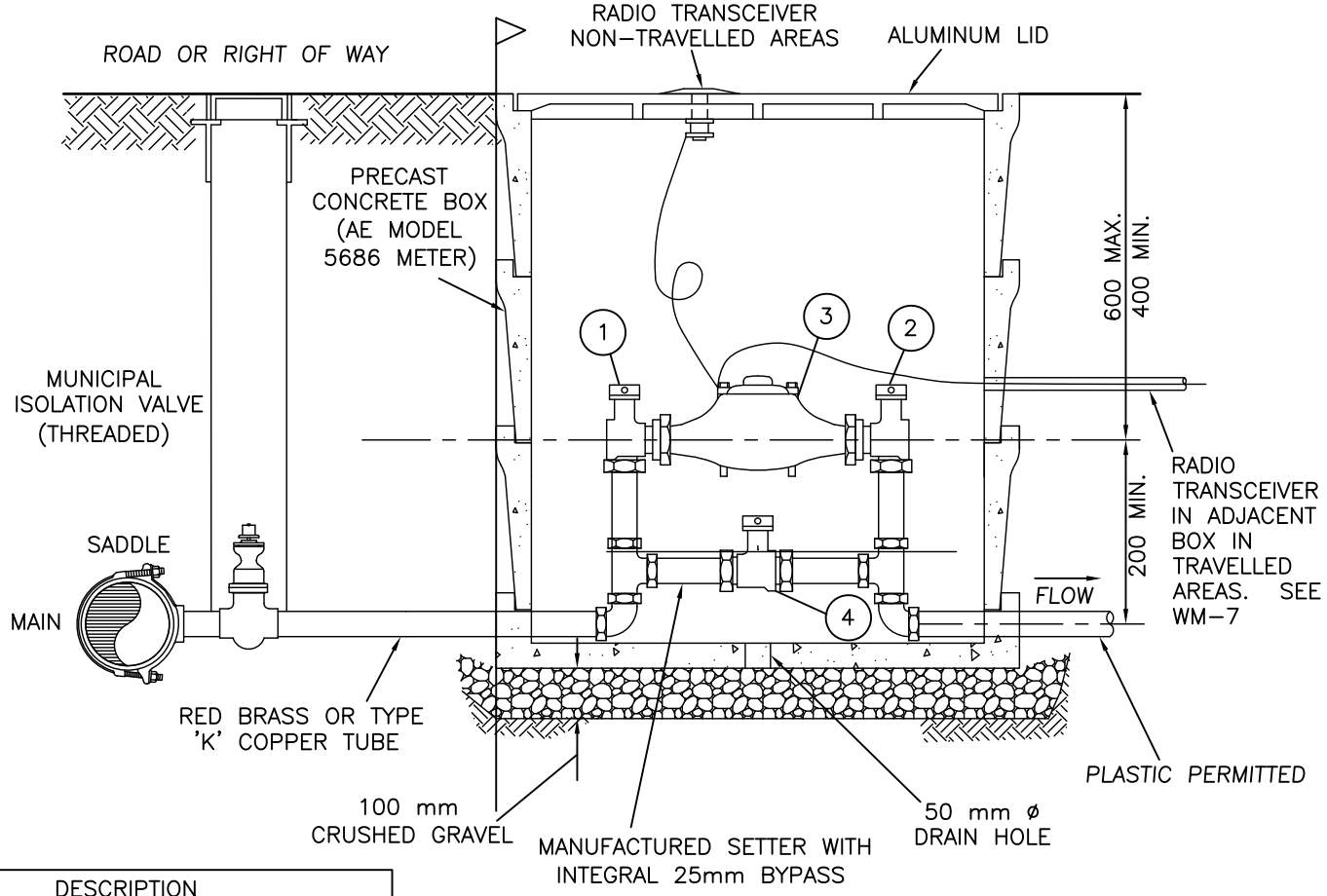
DESIGNED BY: MC	DRAWN BY: A.S.K.	CHECKED BY:	APPROVED BY:
SCALE: N.T.S.	DATE: 11/10/94		DRAWING NO.: WM–2

Coquitlam

STANDARD DETAIL DRAWINGS



PLAN



SECTION

No.	DESCRIPTION
1	STOP WITH LOCKWING
2	DOWNSTREAM STOP
3	METER
4	BYPASS STOP WITH LOCKWING

NOTES:
ALL FIELD JOINTS TO BE THREADED OR COMPRESSION.
ALL PIPE TO BE BRASS OR COPPER TUBE.
MANUFACTURED SETTERS MAY HAVE SOLDERED JOINTS.

PLOTTED: 1-Dec-21

38mmø – 50mmø POSITIVE DISPLACEMENT METER INSTALLATION

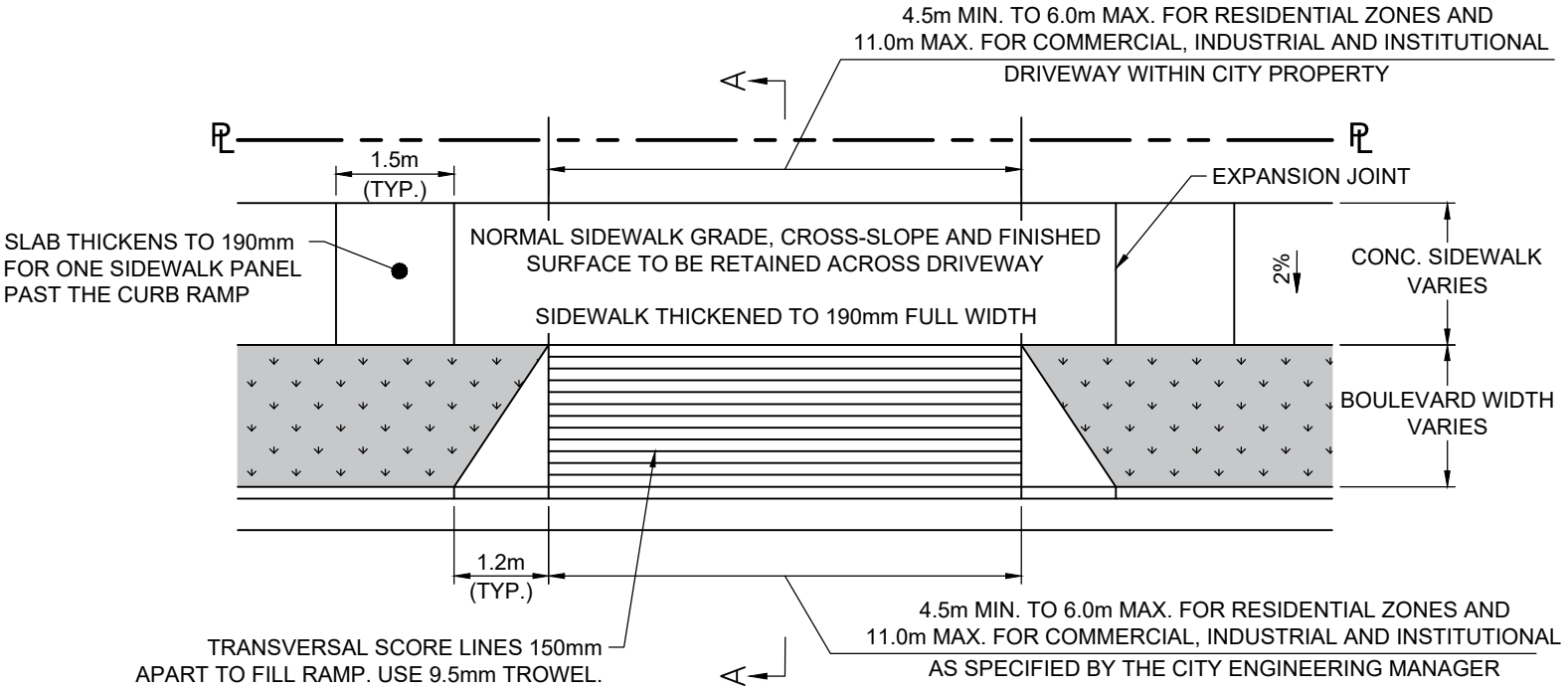
DATE:	DEC/2021
DRAWN:	REY
SCALE:	N.T.S.

DRAWING NUMBER:

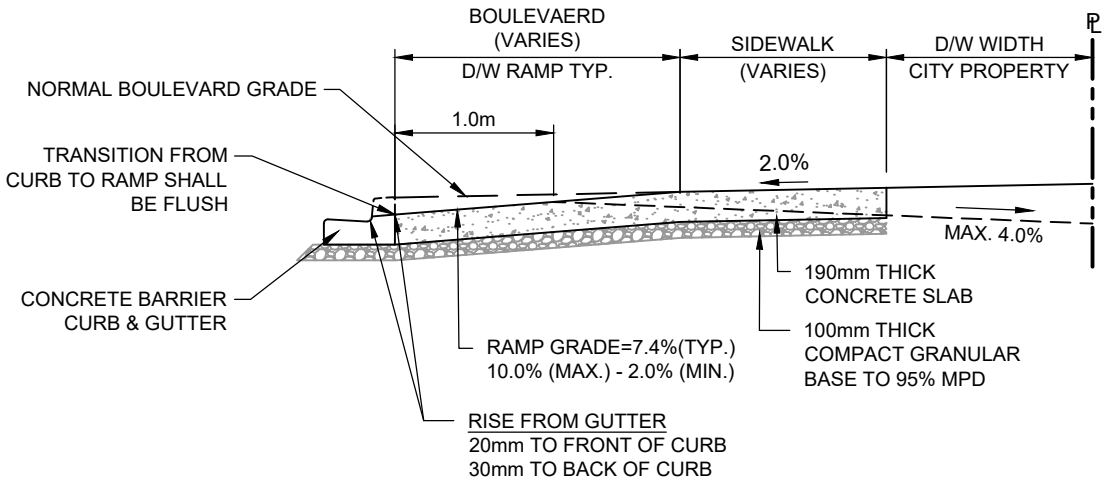
WM-3

Coquitlam

STANDARD DETAIL DRAWINGS



PLAN VIEW



SECTION A-A CURB RAMP

NOTES:

1. DRIVEWAY LETDOWN TO BE CENTERED ON GARAGE.
2. DRIVEWAY WIDTH ON CITY PROPERTY TO MATCH WIDTH OF LETDOWN EXCLUDING THE FLARES.
3. WHERE DRIVEWAY IS AT LOWER GRADE THAN SIDEWALK, CROSSING SLOPES, BREAKOUT POINT AND D/W GRADE AS INDICATED BY DASHED LINE IN SECTION IF APPROVED BY THE CITY ENGINEERING MANAGER.

PLOTTED: 19–NOV–20

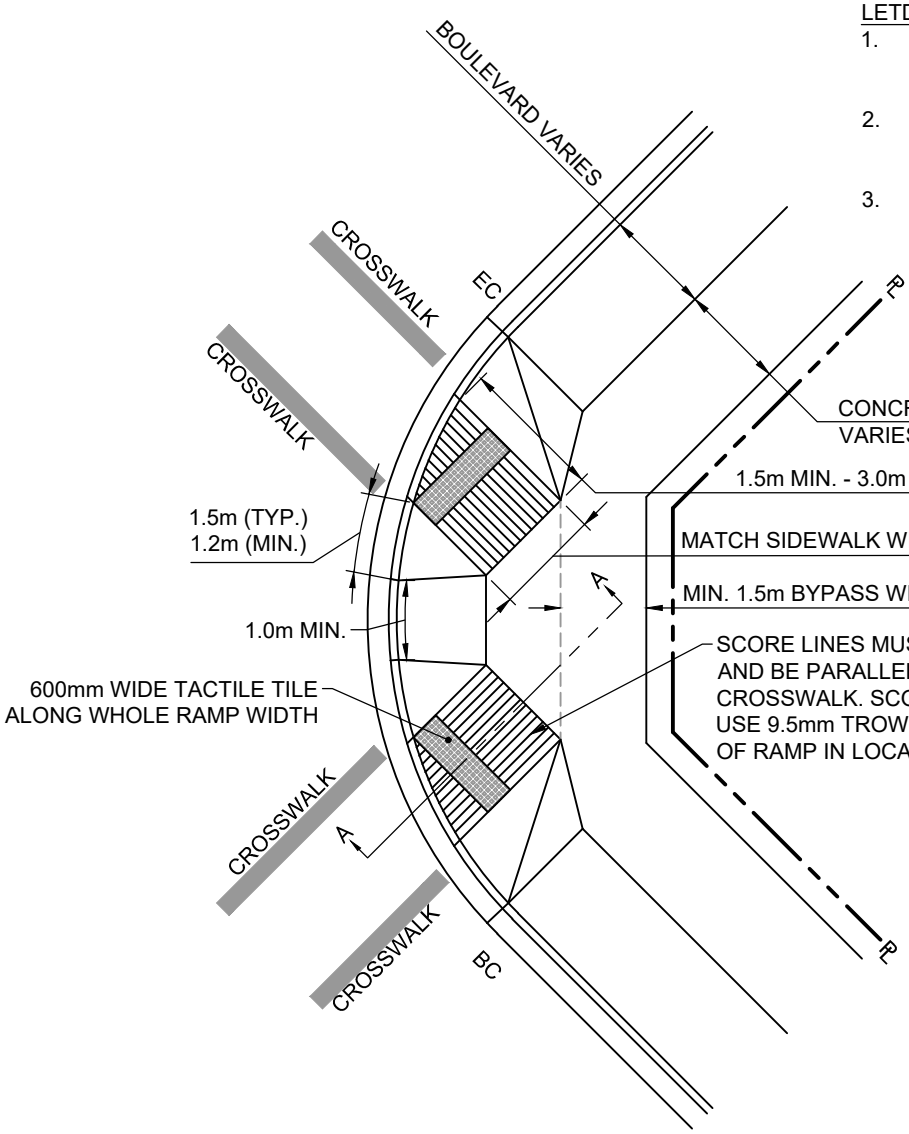
TYPICAL CURB/SIDEWALK DRIVEWAY LETDOWN - SEPARATED SIDEWALK	DATE: NOV/2020 DRAWN: GA SCALE: N.T.S.	DRAWING NUMBER: COQ-C7B

Coquitlam

STANDARD DETAIL DRAWINGS

LETDOWN NOTES:

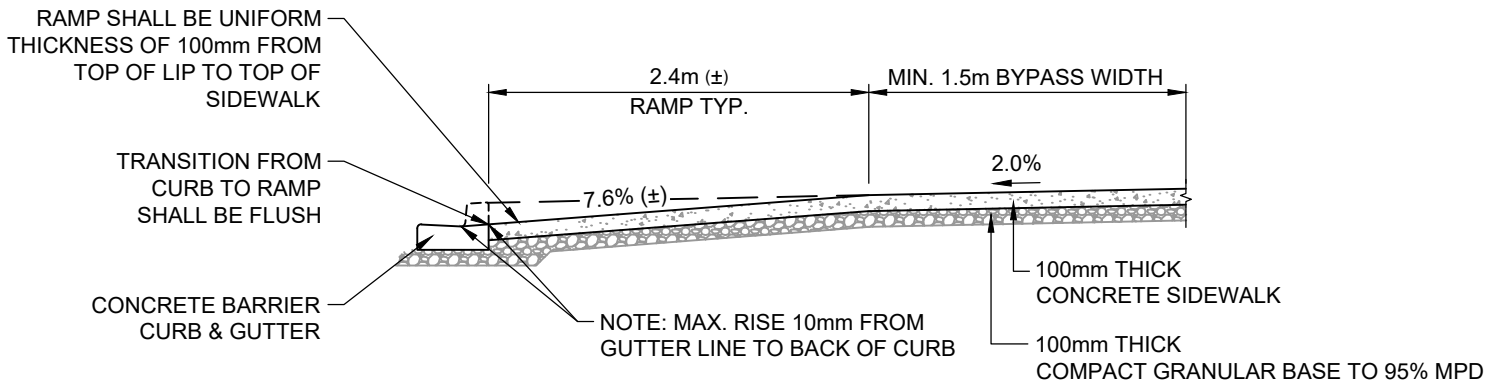
1. STANDARD RAMP LENGTH: 2.4m AT CENTRE OF RAMP. RECOMMENDED RAMP SLOPE: 7.6% (±) MAX. SLOPE 8.3% (1:12) WHERE TOPOGRAPHY PERMITS.
2. WHEN SITE CONDITIONS DO NOT PERMIT TYPICAL LAYOUT DESIGN TO BE APPROVED BY THE CITY ENGINEERING MANAGER.
3. IN CASE OF SINGLE CROSSING: REMOVE UNNECESSARY LETDOWN AND EXTEND BOULEVARD TO CURB RETURN.



TACTILE TILE NOTES:

1. TO BE INSTALLED ONLY WHEN PRESCRIBED BY THE MANAGER.
2. IN-LINE TRUNCATED DOME PATTERN 5.1mm IN HEIGHT, 22.9mm DIAMETER AT THE BASE AND 10.2mm DIAMETER AT THE TOP OF DOME SPACED 59.7mm NOMINAL DIAGONALLY AND 43.2mm NOMINAL SIDE BY SIDE EXCEPT FOR RADIUS TILE.
3. COLOUR: FEDERAL YELLOW PER U.S. FEDERAL STANDARD 595B, TABLE IV, COLOR NO.335.
4. WIDTH = 600mm, LENGTH = RAMP WIDTH
5. REFER TO COQUITLAM APPROVED PRODUCTS LIST FOR ACCEPTABLE SUPPLIERS.

SPLIT LETDOWN



SECTION A-A CURB RAMP

PLOTTED: 19–NOV–20

SPLIT LETDOWN AT INTERSECTION WITH BOULEVARD	DATE: NOV/2020 DRAWN: GA SCALE: N.T.S.	DRAWING NUMBER: COQ-C9A

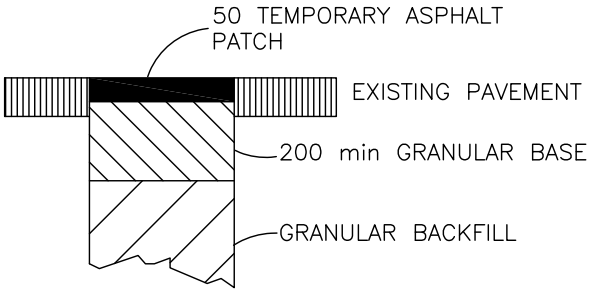
Coquitlam

STANDARD DETAIL DRAWINGS

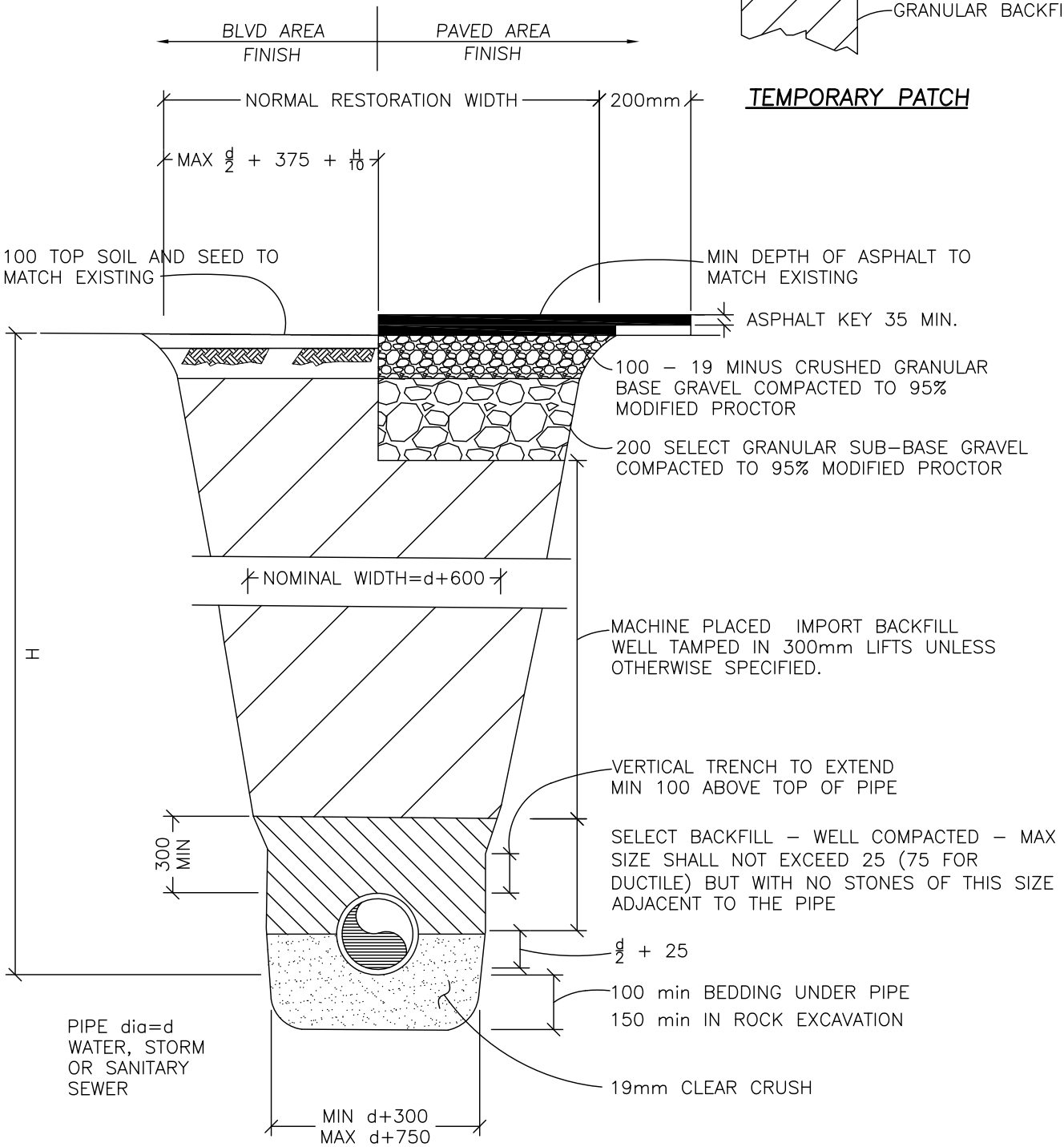
ALL DIMENSIONS IN MILLIMETRES

d = PIPE DIA IN mm

H = TRENCH DEPTH IN mm



TEMPORARY PATCH



PLOTTED: 20–Sep–21

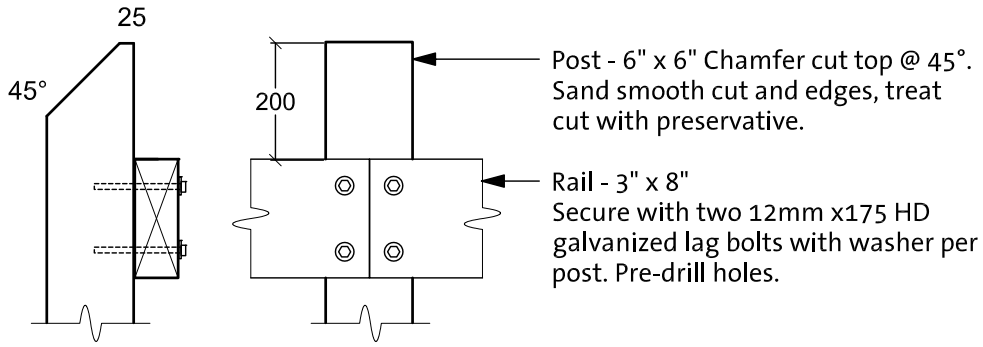
TRENCH DETAILS FOR STANDARD SECTION	DATE: AUG/2021	DRAWING NUMBER: COQ-G4
	DRAWN: REY	
	SCALE: N.T.S.	

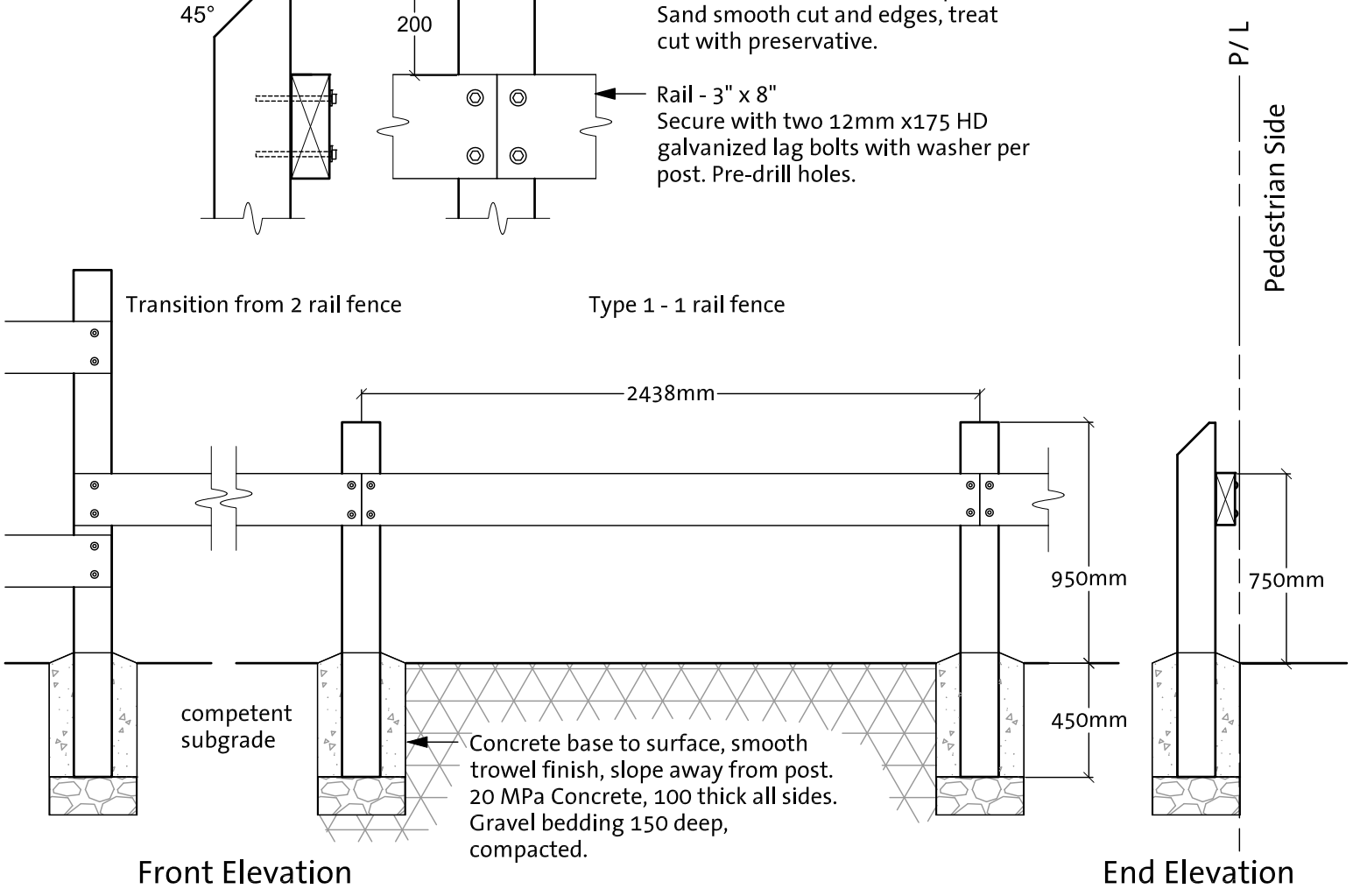
Coquitlam

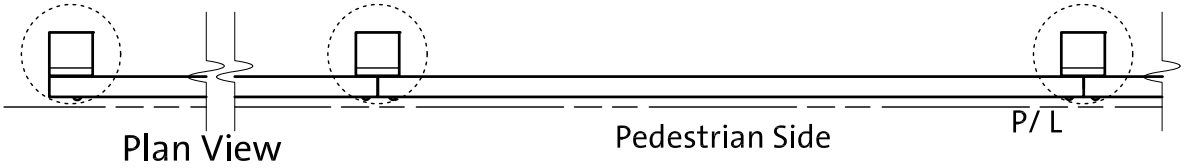
STANDARD DETAIL DRAWINGS

Notes:

1. All wood to be #2 or better pressure treated S4S Douglas Fir.
2. All cuts to be treated with 2 coats wood preservative to match PT colour.
3. All metal hardware to be hot dip galvanized unless noted otherwise.





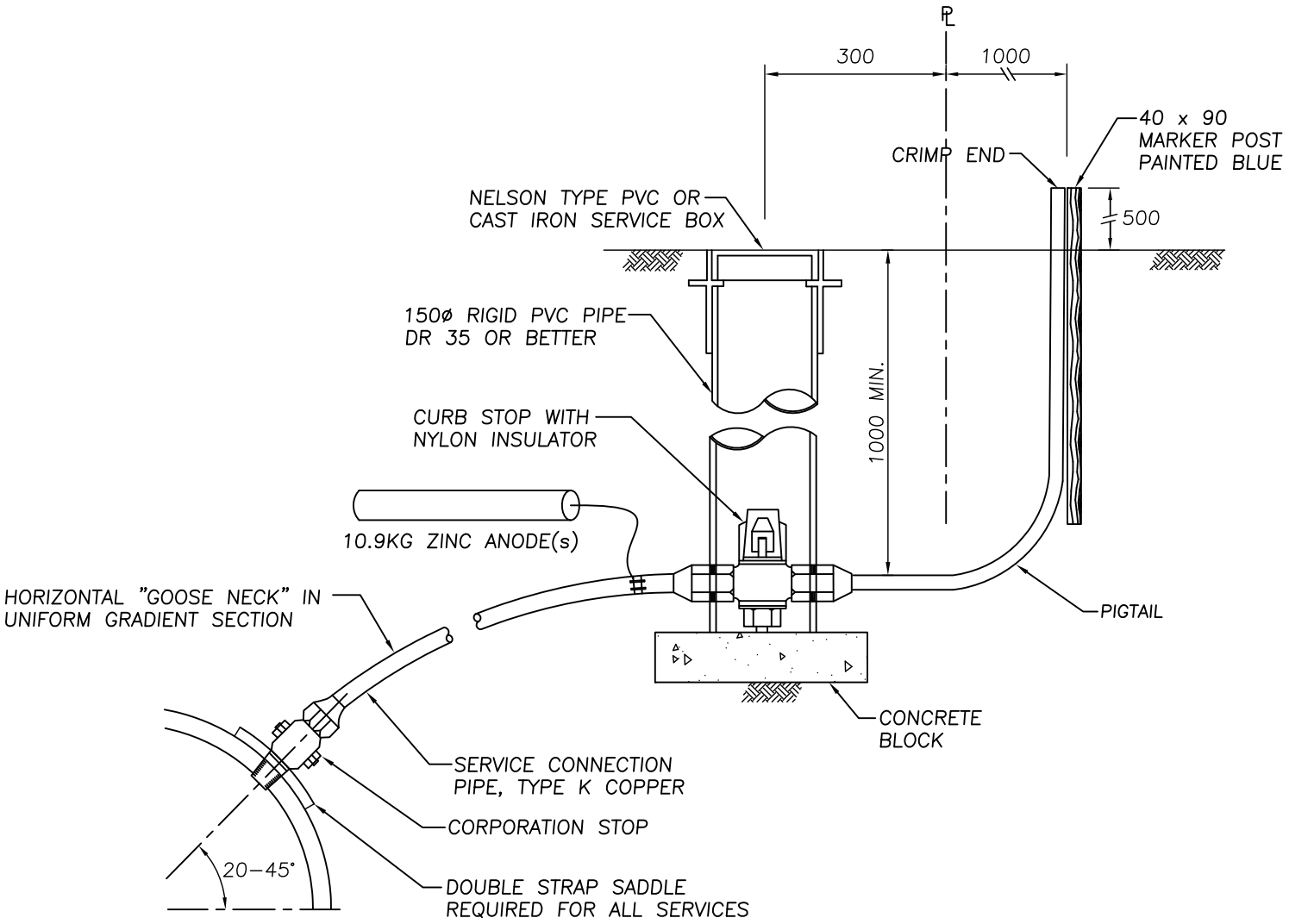


PLOTTED: 29–Feb–16

FENCE TYPE 1 SINGLE RAIL TRAIL FENCE	DATE: DEC/2015 DRAWN: AJM SCALE: N.T.S.	DRAWING NUMBER: COQ-L5A

Coquitlam

STANDARD DETAIL DRAWINGS



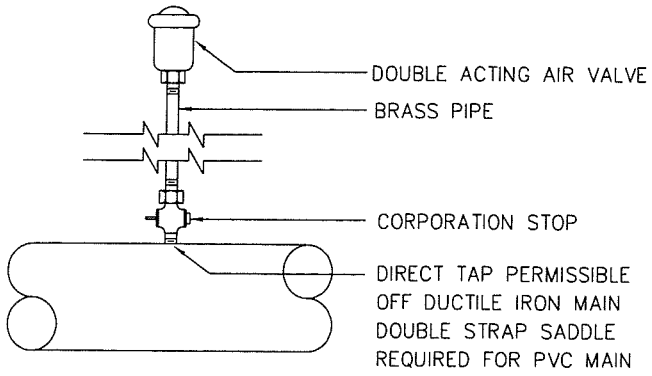
NOTE:

1. THIS DETAIL FOR SERVICES 19 TO 38mm ONLY.
2. SERVICE SADDLES TO SECTION 33 11 01.
3. INSTALL ZINC ANODE PARALLEL AND 0.5m FROM WATER SERVICE PIPE, ADJACENT TO CURB STOP. AN ADDITIONAL ZINC ANODE REQUIRED ANODE ADJACENT TO CORPORATION STOP IF COPPER SERVICE PIPE IS OVER 10m IN LENGTH. PERFORATE CARDBOARD PACKAGING AND CONNECT WITH ELECTRICAL COPPER ALLOY GROUND CLAMP.
4. NYLON INSULATOR ON CURB STOP SHALL BE INSTALLED ON THE PROPERTY SIDE OF VALVE.
5. WHEN CURB STOP INSTALLED IN DRIVEWAY A CAST IRON VALVE BOX MUST BE USED.
6. CORPORATION STOPS ARE TO BE POSITIONED UPRIGHT TO ALLOW OPERATION FROM THE SURFACE.
7. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

PLOTTED: 28–Aug–18

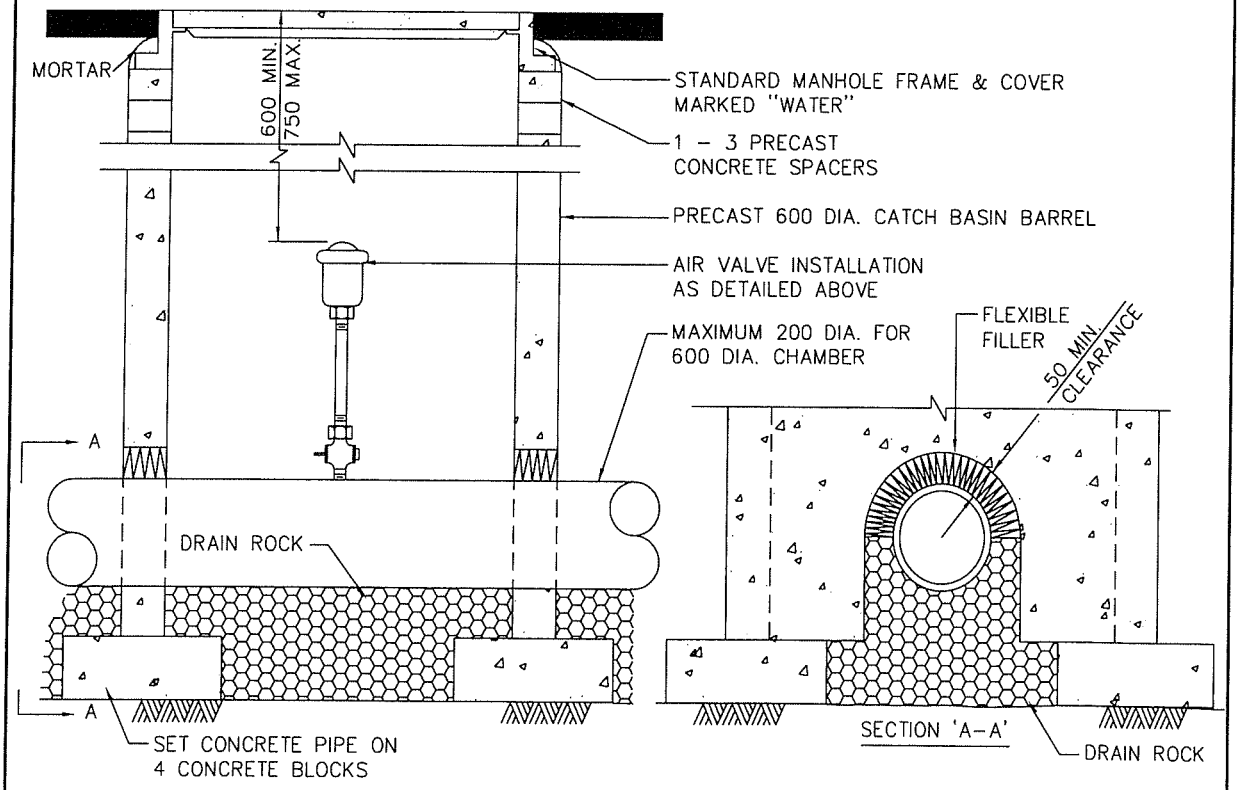
WATER SERVICE CONNECTION 19 TO 38mm DIAMETER	DATE: AUGUST/2018	DRAWING NUMBER: COQ-W2b
	DRAWN: REY	
	SCALE: N.T.S.	

MMCD STANDARD DETAIL DRAWINGS



AIR VALVE SIZE	CORPORATION STOP SIZE
25	25
50	40

AIR VALVE ASSEMBLY DETAIL



CHAMBER DETAIL

NOTE: 1. FOR 25mm AND 50mm AIR VALVES
2. REFER TO CONTRACT DRAWINGS, SECTION 33 11 01 FOR DETAILED SPECIFICATIONS

NOT TO SCALE

2008

AIR VALVE ASSEMBLY – 25 AND 50mm VALVES

DRAWING NUMBER: **W6**

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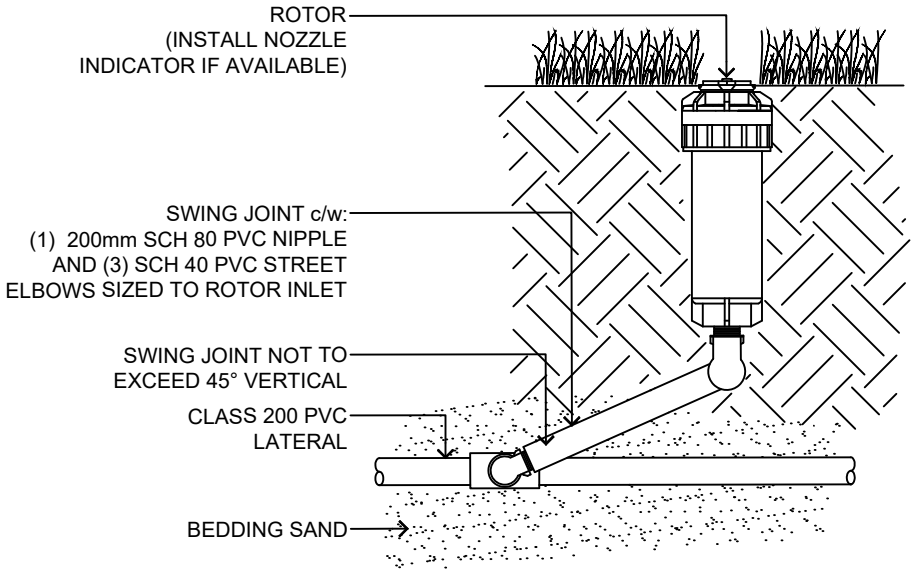
Coquitlam

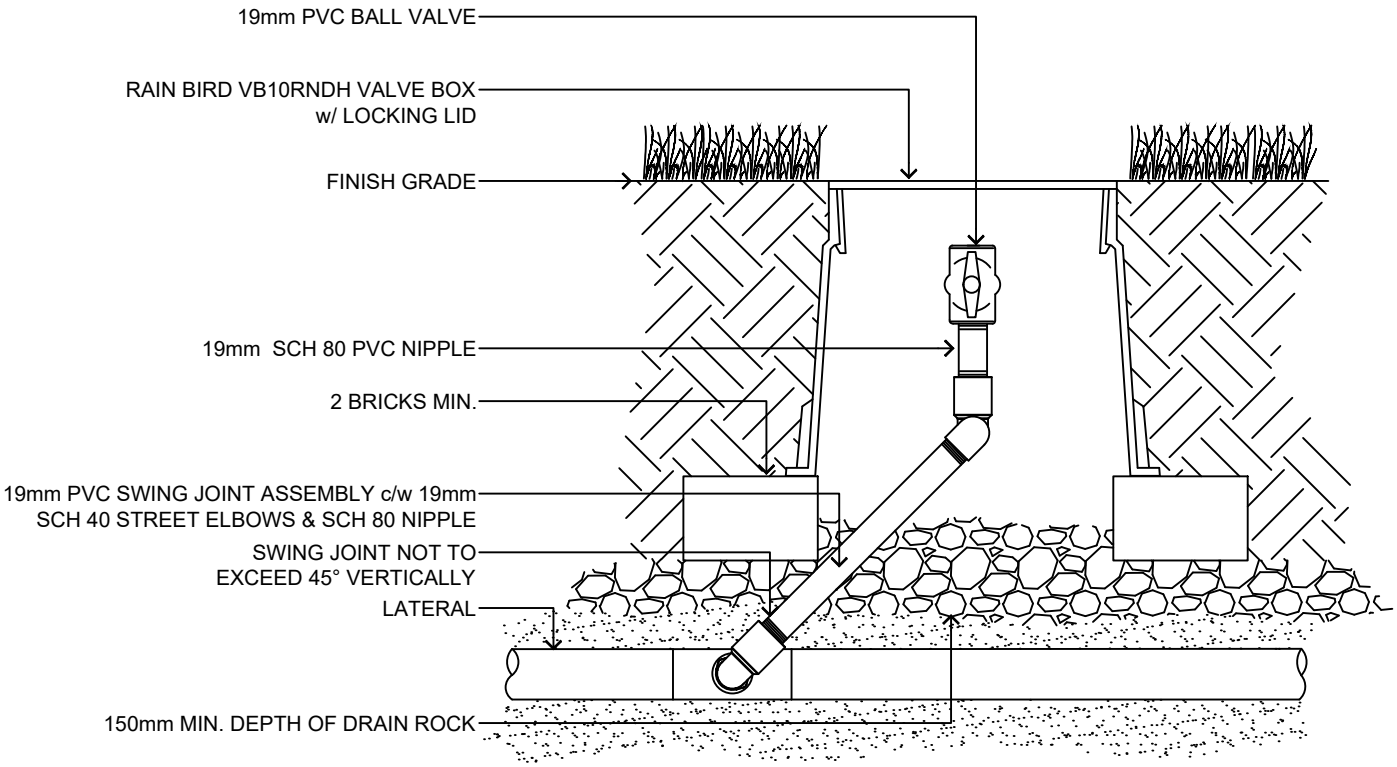
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	ROTOR
REV 30/11/2018	DETAIL NO: PRC-ID-03

Coquitlam

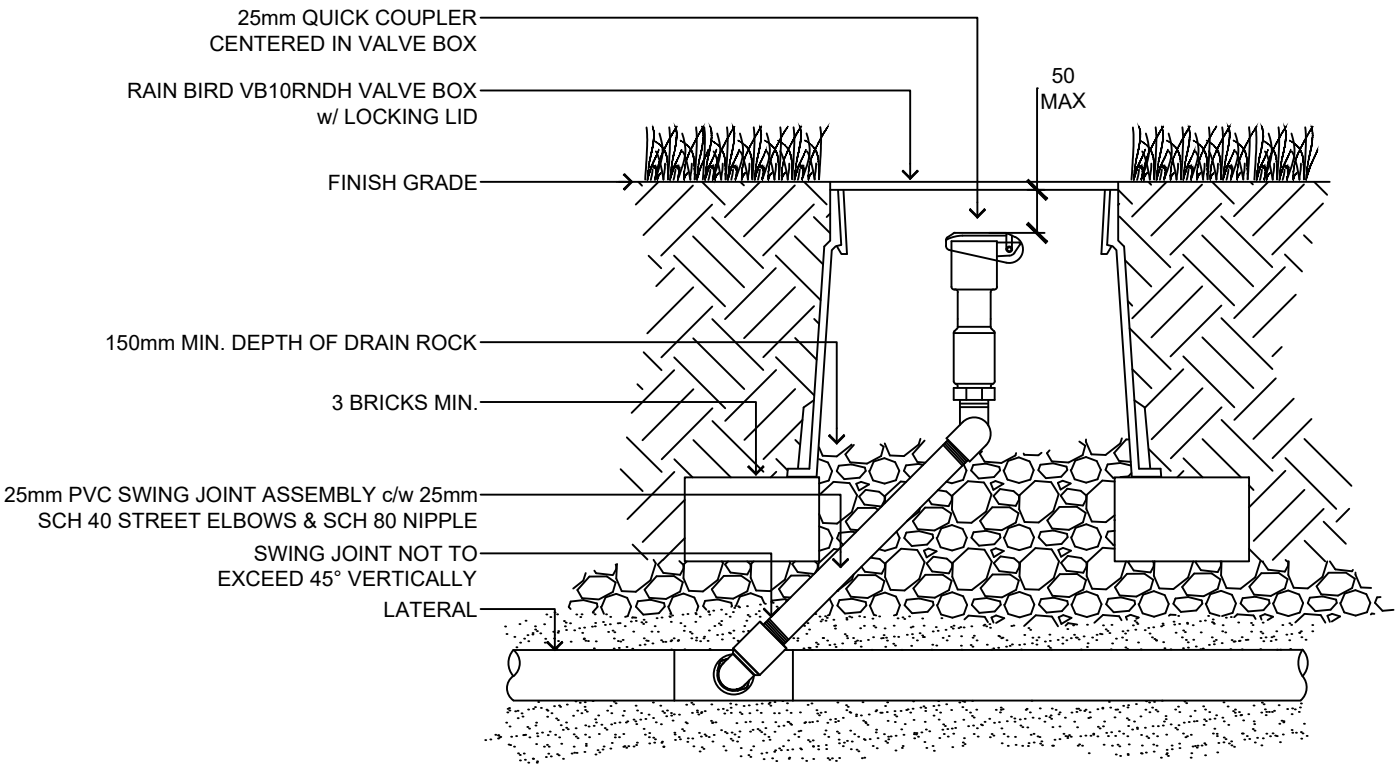
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	FLUSH VALVE ASSEMBLY
REV 30/11/2018	DETAIL NO: PRC-ID-05

Coquitlam

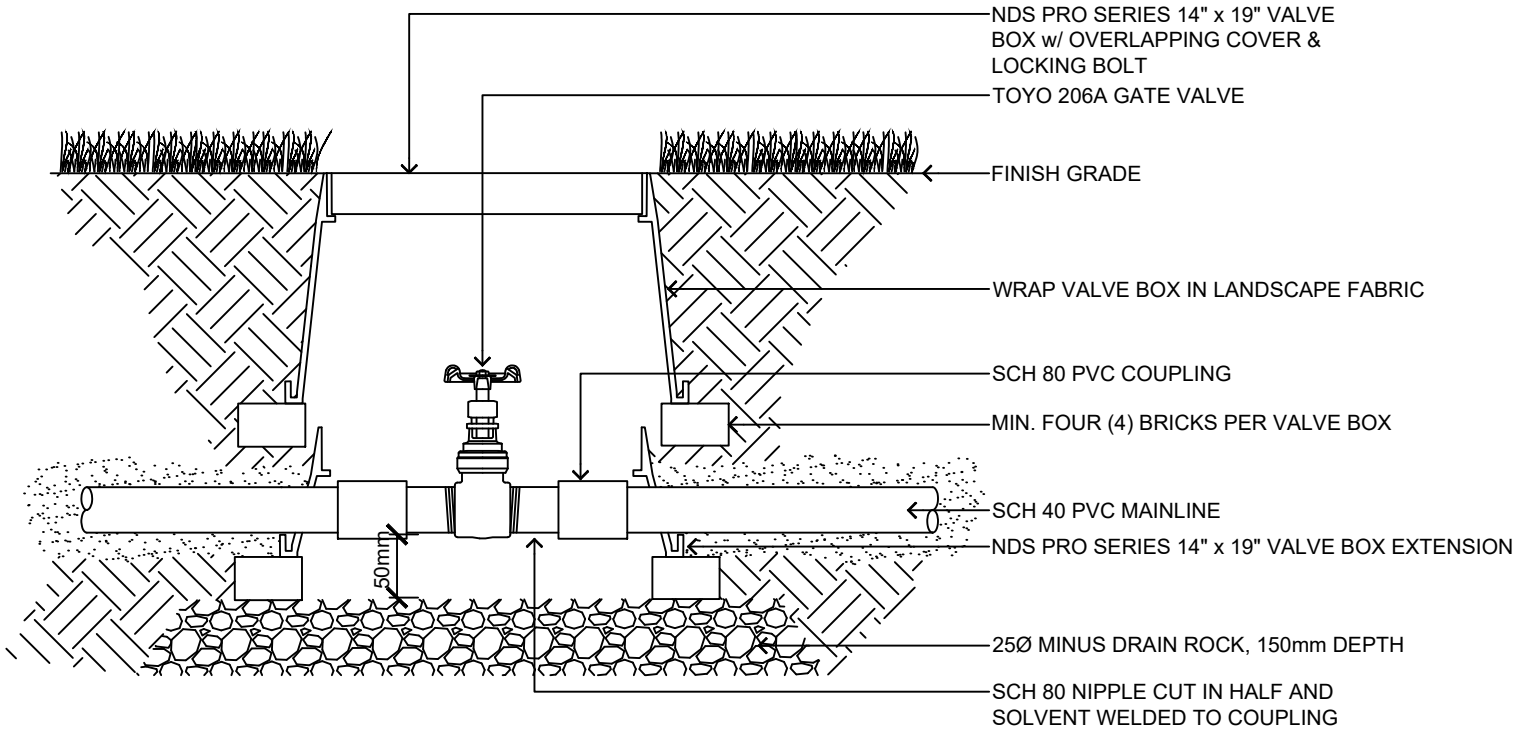
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	QUICK COUPLER
REV 30/11/2018	DETAIL NO: PRC-ID-06

Coquitlam

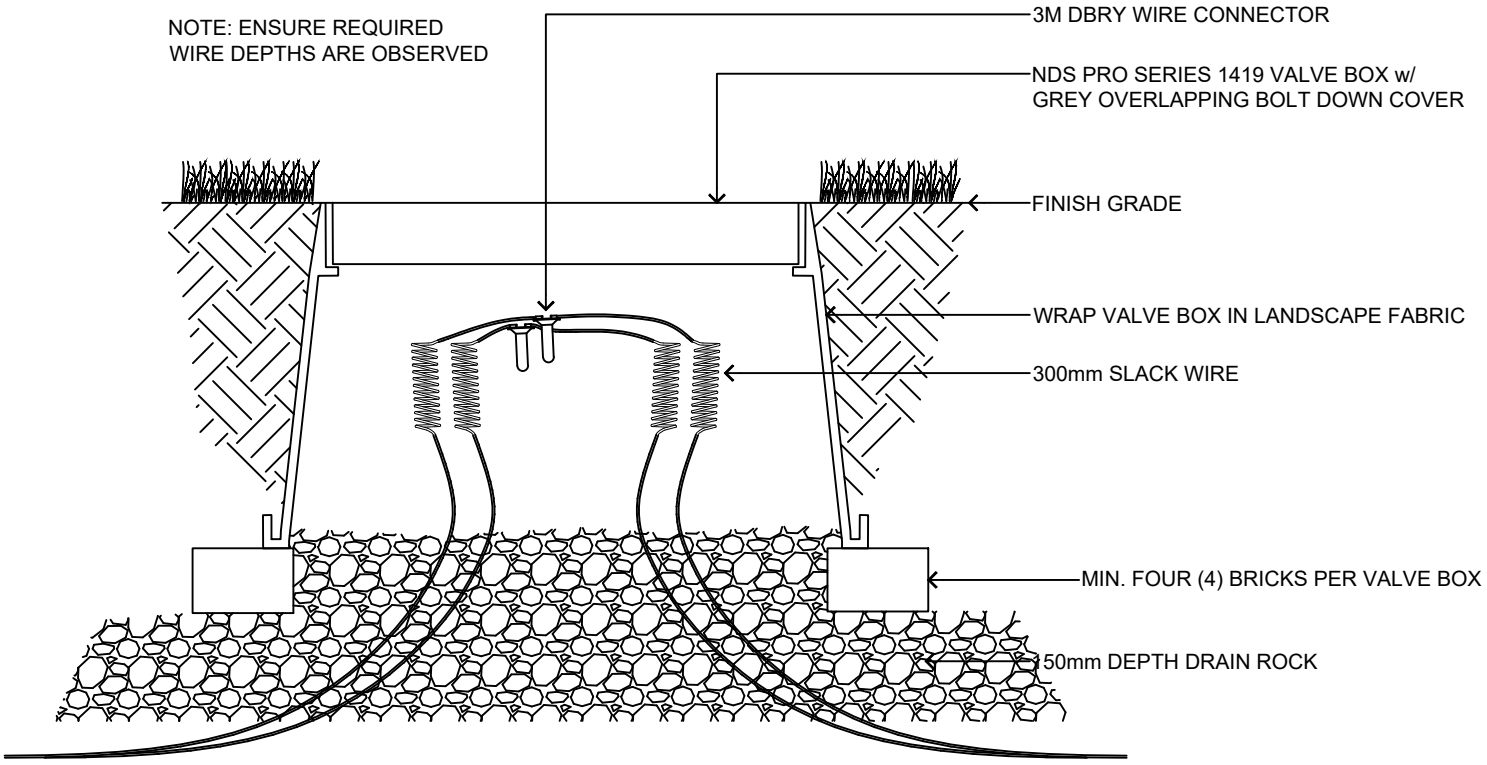
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	GATE VALVE
REV 30/11/2018	DETAIL NO: PRC-ID-07

Coquitlam

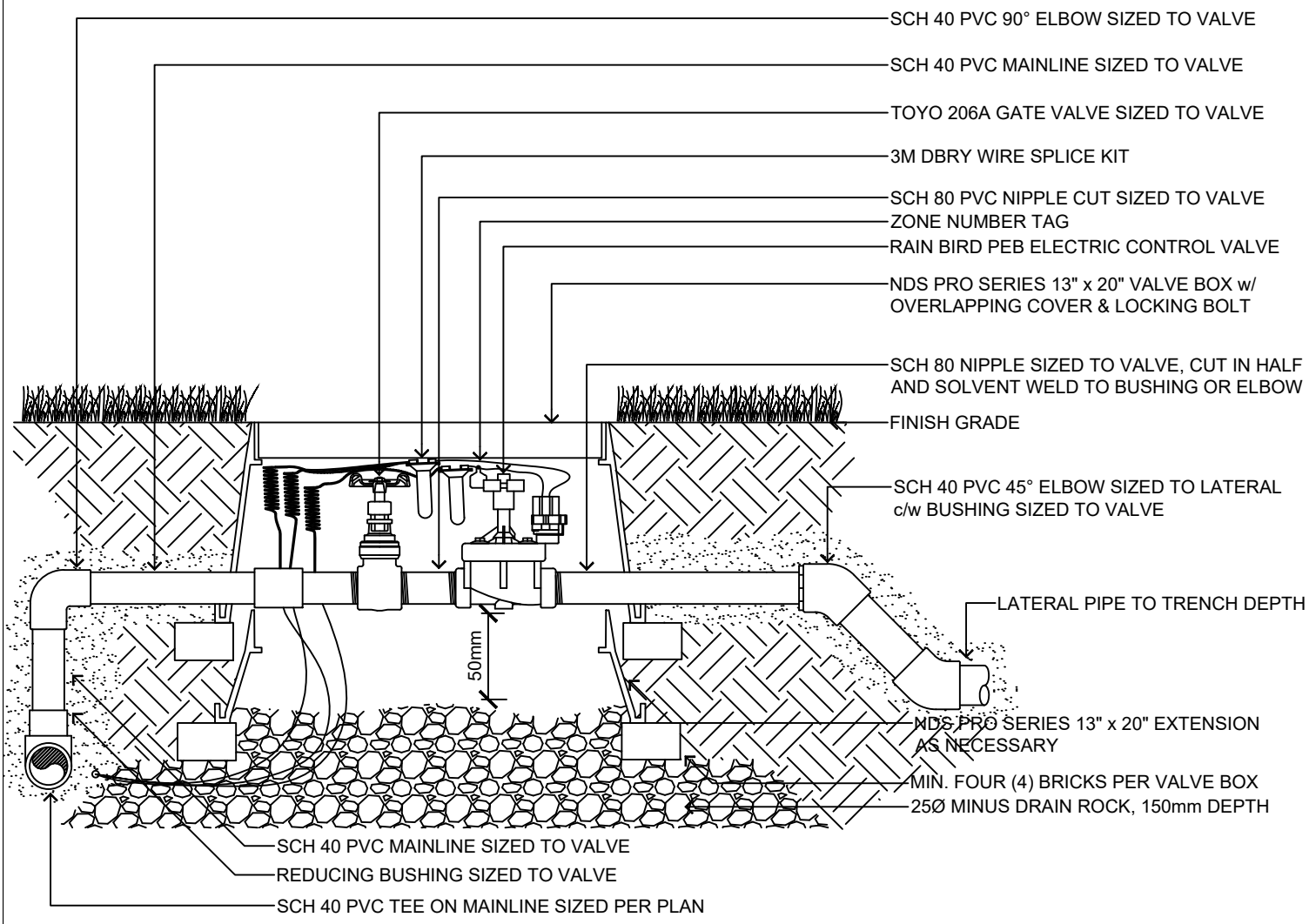
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	WIRE SPLICE BOX
REV 30/11/2018	DETAIL NO: PRC-ID-08

Coquitlam

PARK DEVELOPMENT STANDARDS



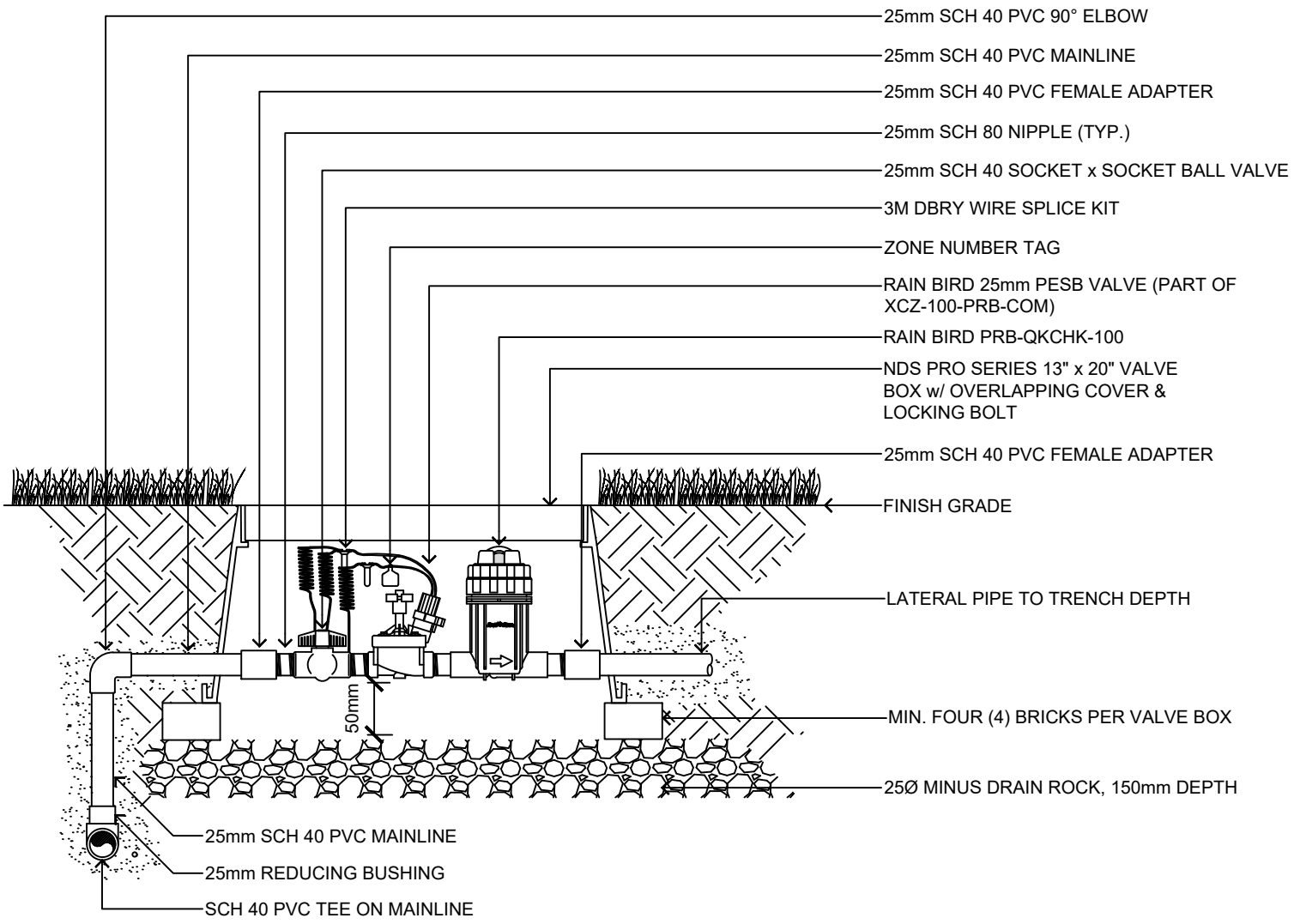
NOTE:

- CENTER VALVE IN VALVE BOX
- DO NOT INSTALL VALVE OVER MAINLINE
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX IN LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL

SCALE N.T.S.	38mm TO 50mm ELECTRIC CONTROL VALVE
REV 30/11/2018	DETAIL NO: PRC-ID-10

Coquitlam

PARK DEVELOPMENT STANDARDS



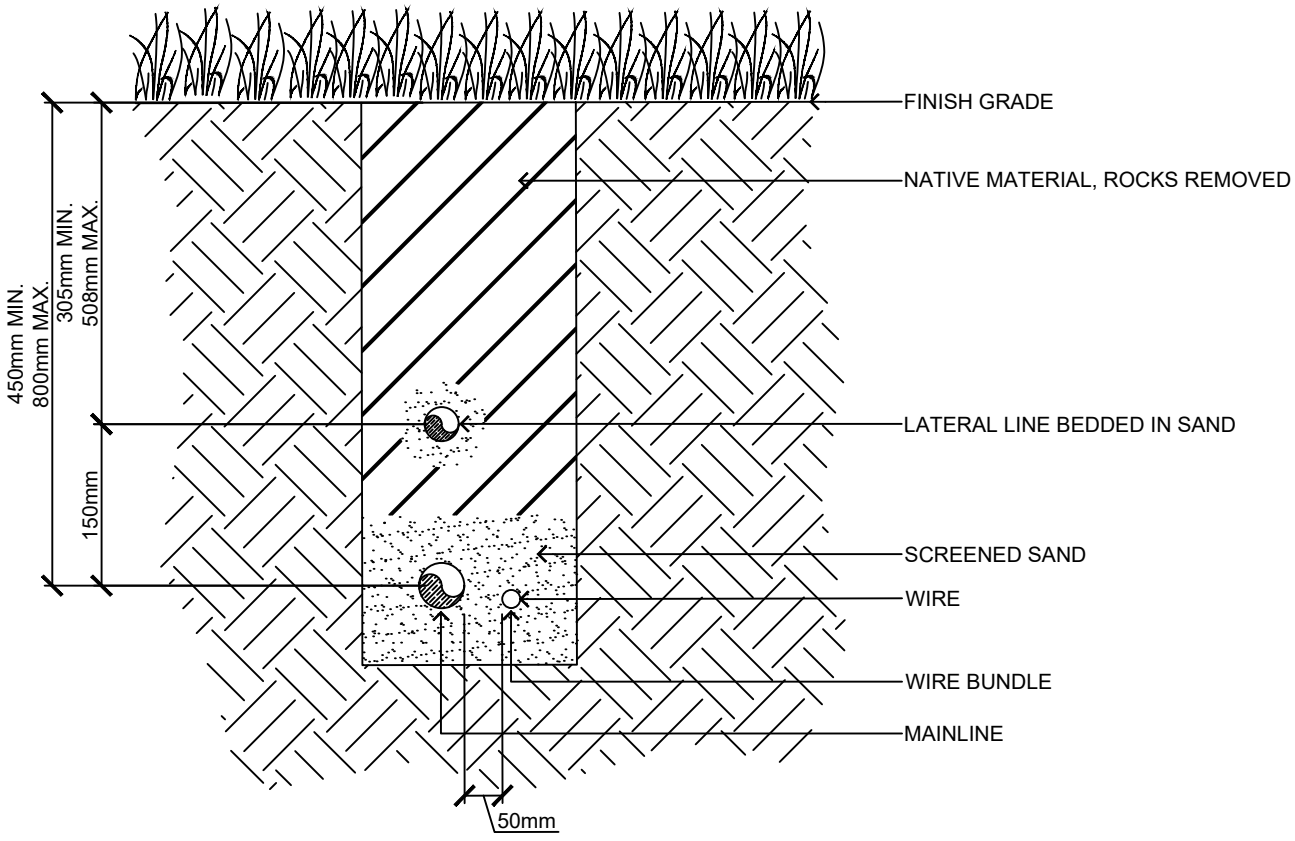
NOTE:

- CENTER VALVE IN VALVE BOX
- DO NOT INSTALL VALVE OVER MAINLINE
- OPERATING FLOW RANGE: 0.3 TO 20 gpm
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX IN LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL

SCALE N.T.S.	CONTROL ZONE KIT
REV 30/11/2018	DETAIL NO: PRC-ID-11

Coquitlam

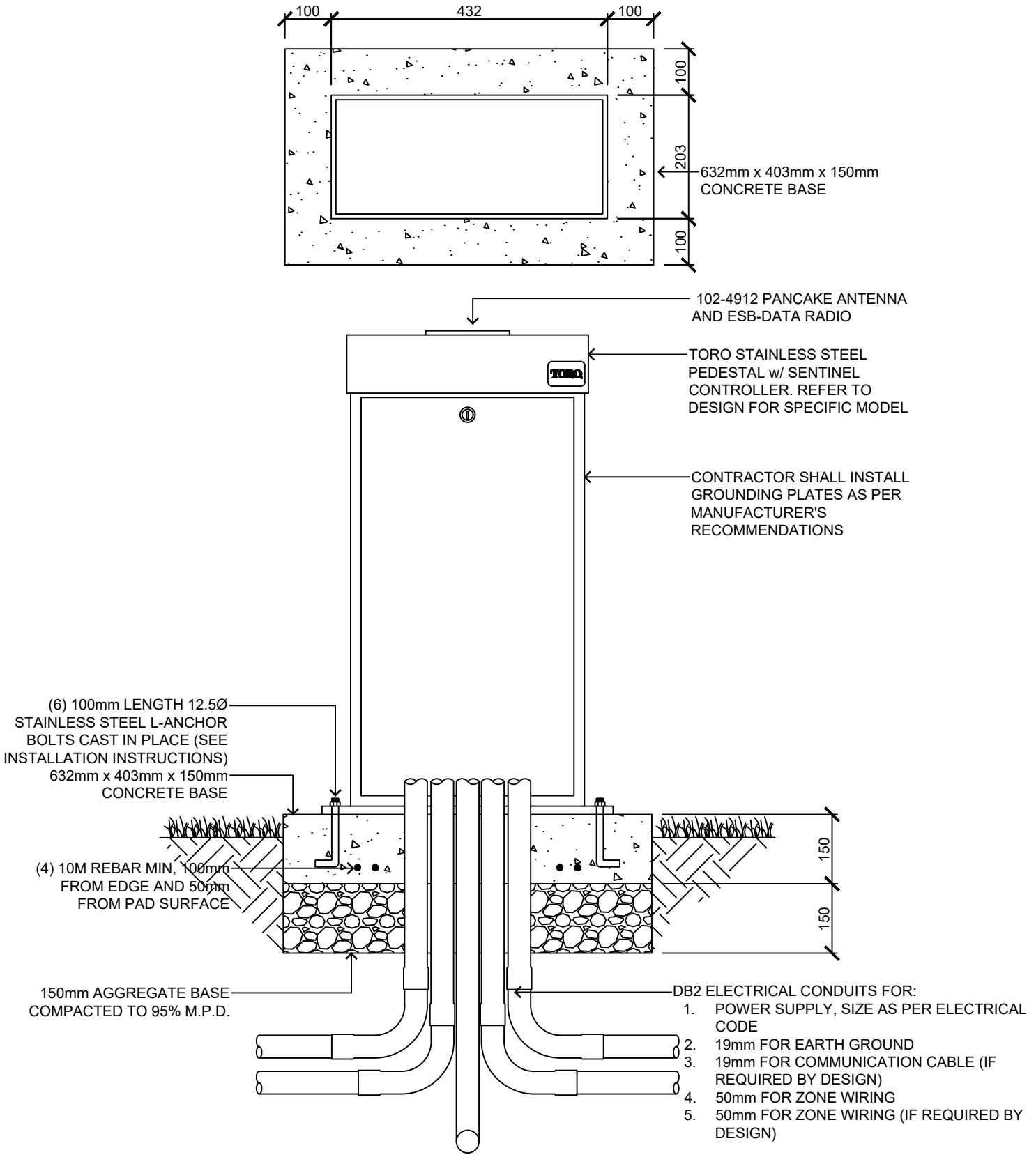
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	TRENCH SECTION
REV 30/11/2018	DETAIL NO: PRC-ID-12

Coquitlam

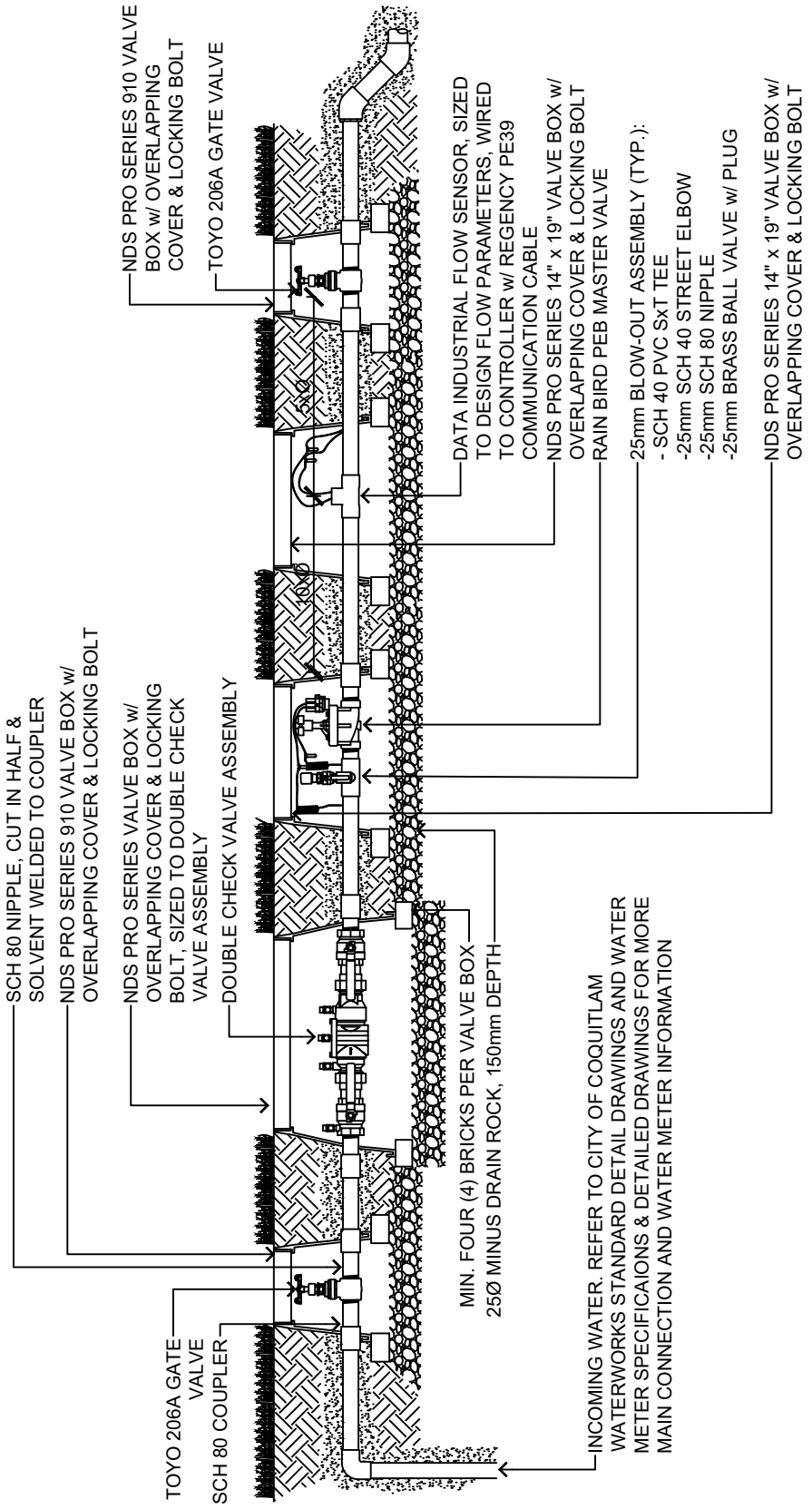
PARK DEVELOPMENT STANDARDS



SCALE N.T.S.	IRRIGATION CONTROLLER - PEDESTAL MOUNT
REV 30/11/2018	DETAIL NO: PRC-ID-15

Coquitlam

PARK DEVELOPMENT STANDARDS



SCALE N.T.S.

REV 30/11/2018

25mm TO 50mm POINT OF CONNECTION

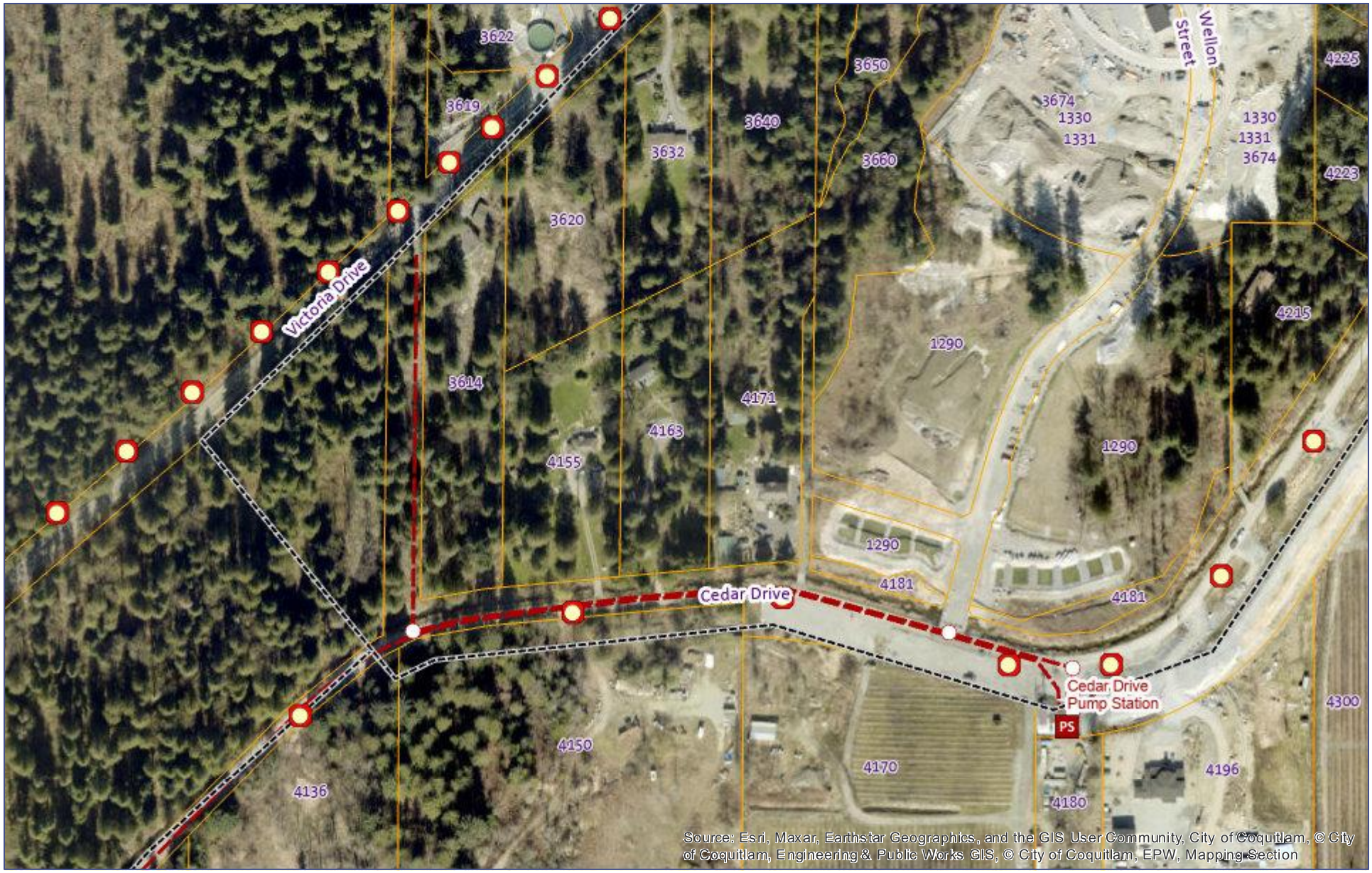
DETAIL NO: PRC-ID-18

Appendix I -

As-Built Drawings

City of Coquitlam

Coquitlam



Map Printed 4/3/2025

The City of Coquitlam assumes no responsibility with respect to the accuracy, completeness or appropriateness of information shown.

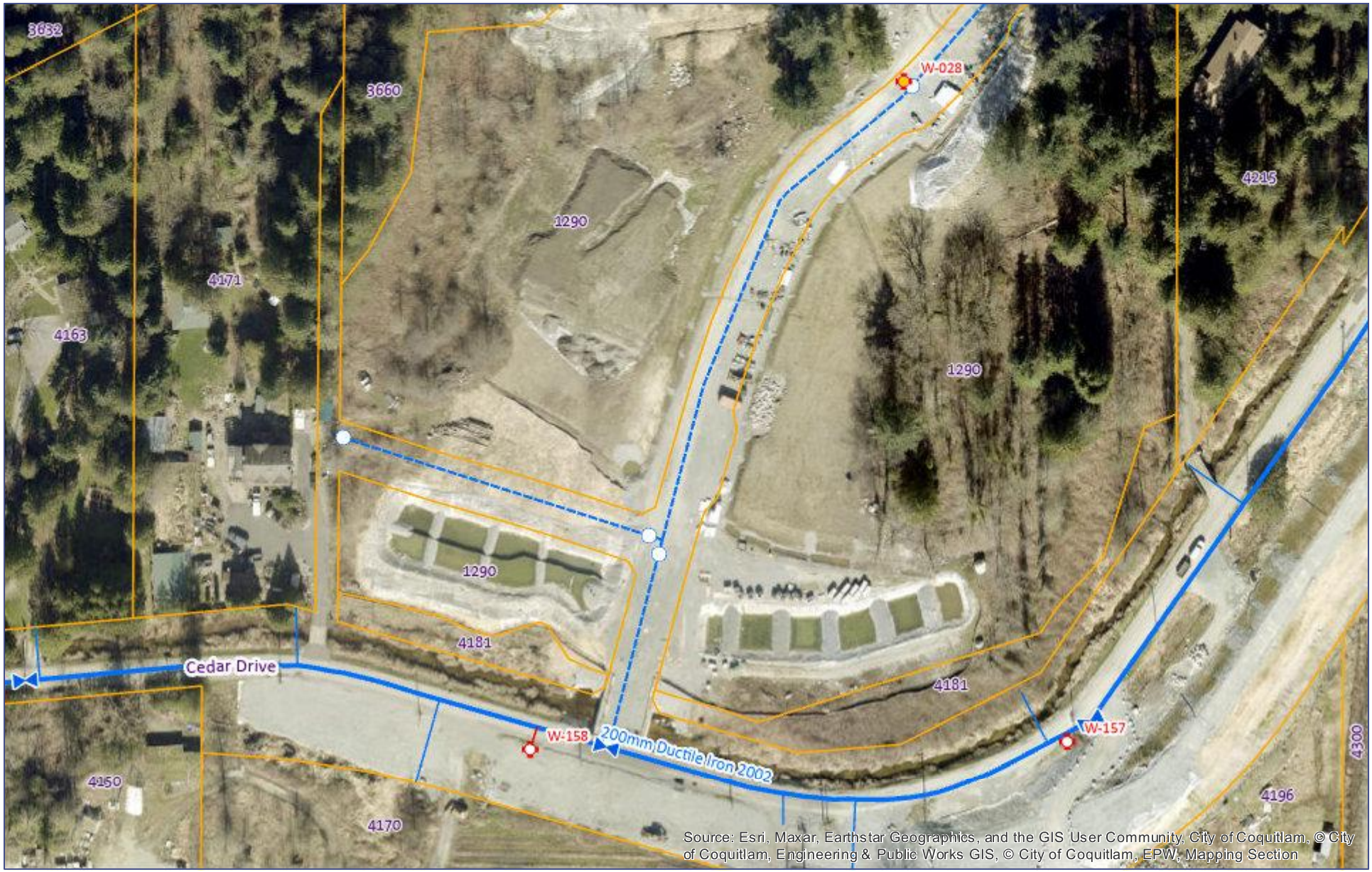
0 0.1 0.2 km

1:4,514

North

City of Coquitlam

Coquitlam



Map Printed 4/3/2025

The City of Coquitlam assumes no responsibility with respect to the accuracy, completeness or appropriateness of information shown.

0 0.05 0.1 km

1:2,257

North

NOTES:

1. GEODETIC ELEVATIONS ARE DERIVED FROM TIES TO INTEGRATED SURVEY CONTROL MONUMENT 77H4126. LOCATED AT INTERSECTION OF OLIVER ROAD AND GILLEYS TRAIL, PUBLISHED ELEVATION=4.574m, DATUM IS [CGVD28 (GVRD 2005)].
2. THIS PLAN SHOWS HORIZONTAL GROUND LEVEL MEASURED DISTANCES. PRIOR TO COMPUTATION OF NAD83 U.T.M. COORDINATES MULTIPLY BY THE COMBINED FACTOR 0.9995887. DATE OF SURVEY COMPLETION IS APRIL 3, 2020.
3. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE INDICATED IN THE PUBLIC ROAD ALLOWANCE ONLY AND ARE SHOWN APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. BC ONE-CALL PROVIDES UNDERGROUND UTILITY LOCATIONS (1-800-474-6886).
4. BASEMAP WAS IMPORTED FROM CITY OF COQUITLAM G.I.S. COORDINATE GEOMETRY. ACCURACY IS ESTIMATED AT ±0.1m.

15
PLAN 25042

IMPORTANT:
HYDRO, GAS, TELEPHONE AND CABLE **ARE NOT SHOWN** ON THE CITY OF COQUITLAM AS-BUILTS OR RECORD DRAWINGS. **CONTACT BC HYDRO, FORTIS BC, TELUS AND SHAW FOR CURRENT AS-BUILTS PERTAINING TO THESE UTILITIES.**

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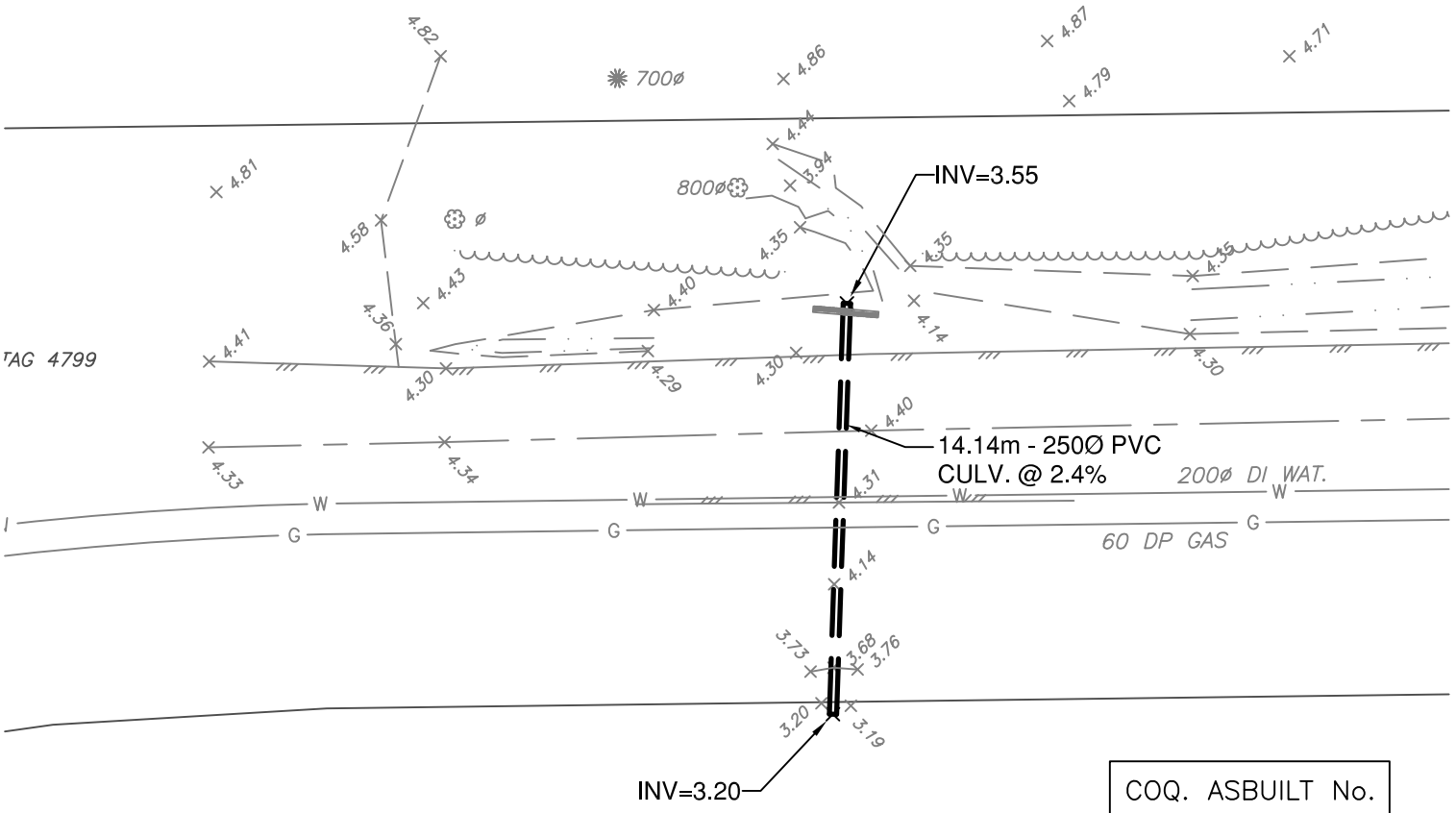
OLIVER ROAD

#4265 OLIVER ROAD



COQ. ASBUILT No.
D3058-01

Destroy All Prints Bearing Rev. No. less than one indicated below

1:250 0 5 15m

City of Coquitlam			
CULVERT #4265 OLIVER ROAD			
RECORD DRAWING		1	15 MAY/2020
REVISIONS		No.	DATE:
DESIGNED:	DRAWN: R.D.	CHECKED:	PLOTTED: 28-May-20
SCALE: 1:250	DATE: 15 MAY/2020	SHT. 1 OF 2	FILE:20Oliver04220524A1

NOTES:

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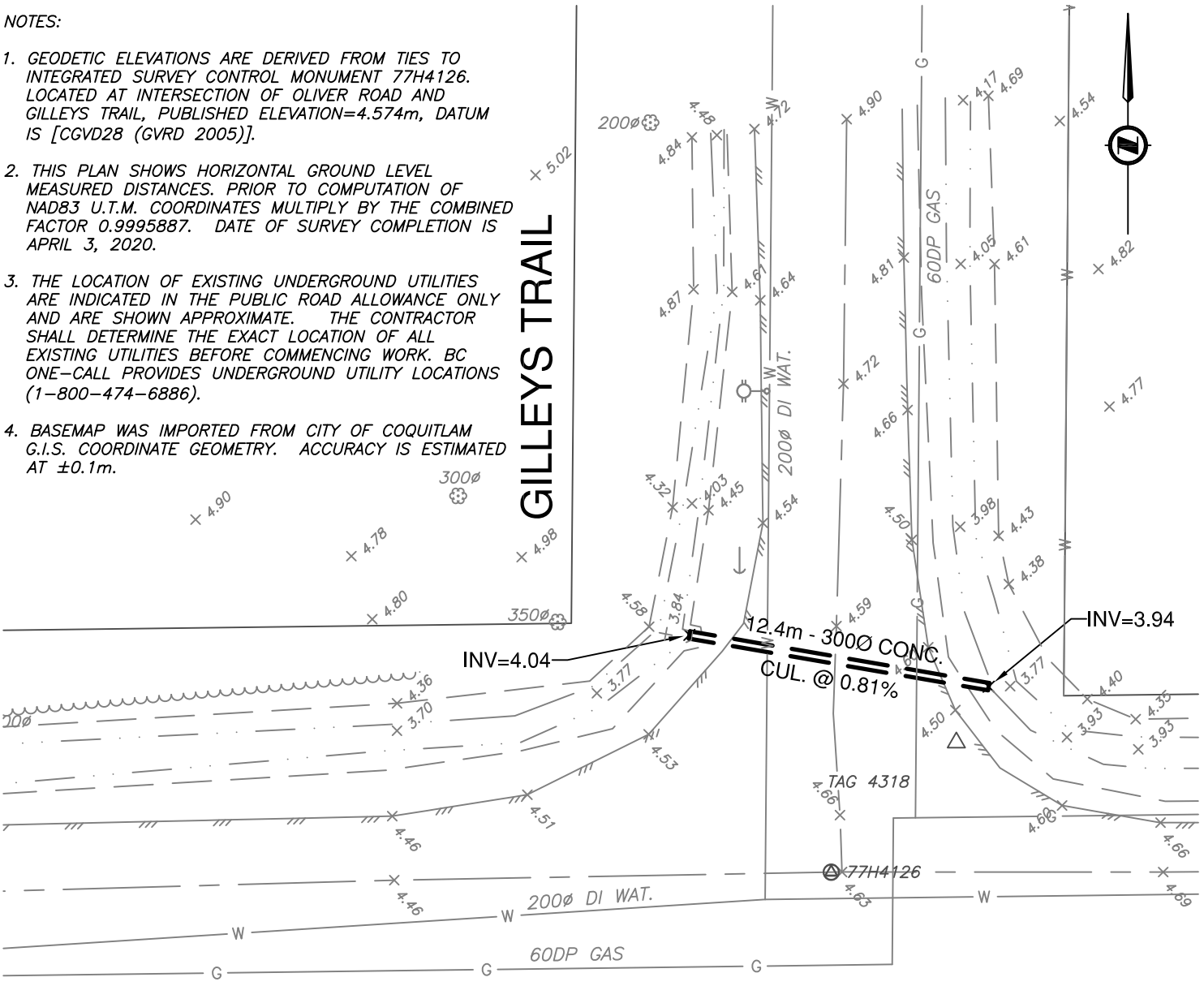

CULVERT INDICATED IN BOLD ARE NOT NEW WORKS BUT ARE PREVIOUSLY UNDOCUMENTED RECORD INFORMATION DESCRIBED SPECIFICALLY ON THIS PLAN.

OLIVER ROAD

COQ. ASBUILT No.
D3058-02

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1:250 0 5 15m

Destroy All Prints Bearing Rev. No. less than one indicated below

City of Coquitlam			
CULVERT OLIVER ROAD AND GILLEYS TRAIL			
RECORD DRAWING		1	15 MAY/2020
REVISIONS		No.	DATE:
DESIGNED:	DRAWN: R.D.	CHECKED:	PLOTTED: 28-May-20
SCALE: 1:250	DATE:	SHT. 2 OF 2	FILE:20Oliver04220524A1

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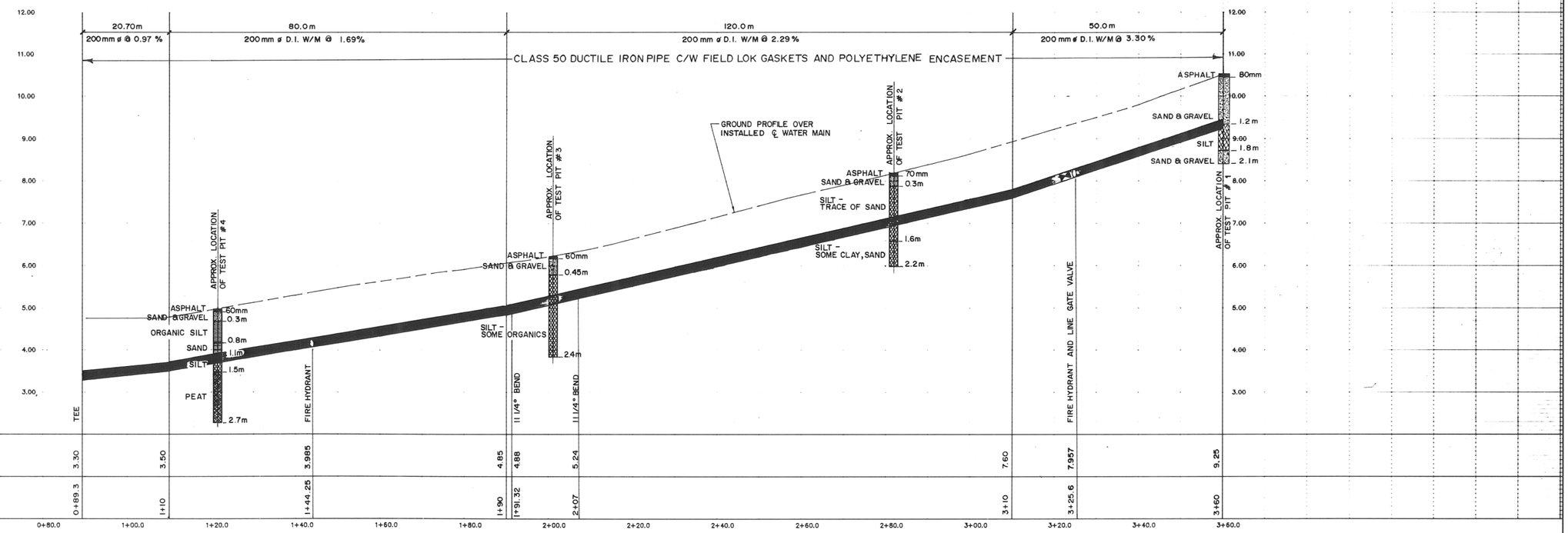
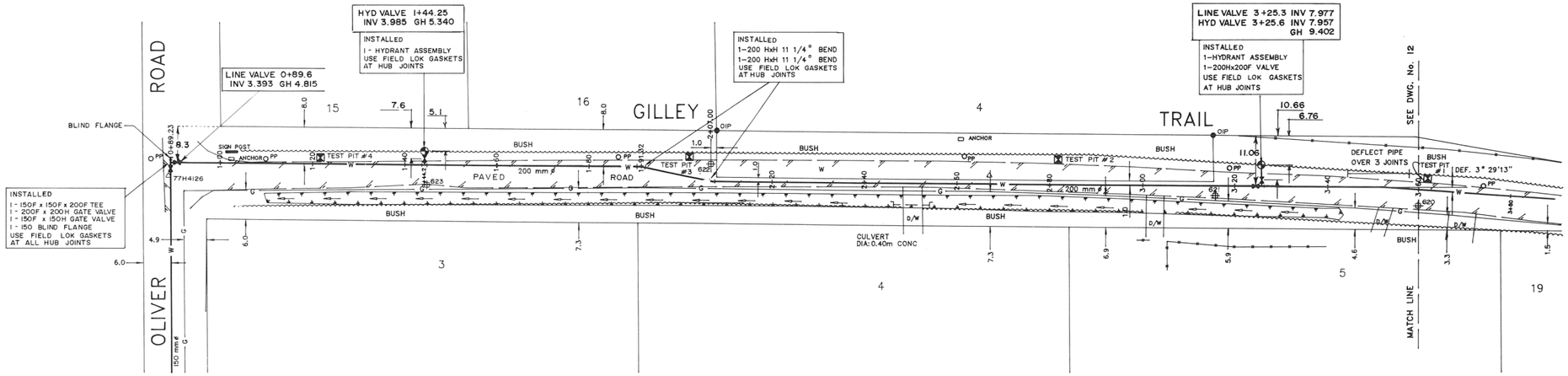


NOTE :
CONTRACTOR SUPPLIED AND INSTALLED FIELD LOK GASKETS FOR ALL DUCTILE IRON PIPE JOINTS AND POLYETHYLENE ENCASEMENT OF WATERMAIN PIPE ALONG GILLEY'S TRAIL BETWEEN STA. 0+89.3 AND 3+60. TRENCH BACKFILL IS IMPORTED RIVER SAND AS SPECIFIED IN THE CONTRACT DOCUMENTS.



NORTHING	EASTING	ELV	DESCRIPTION
62429.030	20673.899	37.360	MON 77H4131
62514.100	20776.375	30.810	MON 77H4130
62628.471	20913.218	17.580	MON 77H4129
62774.454	20467.319	56.030	MON 73H0467
62155.586	20276.603	40.580	MON 73H466
61984.582	20119.352	32.110	MON 73H0465
62449.489	20884.278	11.810	MON 77H4128
62293.237	20873.125	7.620	MON 77H4127
62116.359	20873.196	4.630	MON 77H4126
62677.593	20970.372	19.811	HUB76
62745.895	21059.344	19.375	HUB77
62758.701	21142.455	19.220	HUB78
62797.215	21241.523	18.401	HUB79
62519.061	20267.879	70.871	HUB80
62191.097	20270.749	43.504	HUB81
62235.243	20270.342	46.723	HUB82
62278.087	20270.250	49.337	HUB83
62320.081	20269.837	52.080	HUB84
62362.259	20269.977	55.430	HUB85
62446.875	20269.818	62.446	HUB87
62520.705	20335.486	67.653	HUB88
62516.799	20223.015	74.420	HUB89
62517.383	20180.804	79.249	HUB90
62518.611	20139.785	84.845	HUB91
62519.445	20099.549	90.058	HUB92
62523.391	20059.717	94.497	HUB93
62118.105	20237.091	39.661	HUB94
62123.474	20196.005	42.311	HUB95
62122.934	20151.438	44.784	HUB96
62122.008	20129.048	46.383	HUB97
62123.312	20087.935	49.530	HUB98
62125.516	20072.699	51.050	HUB99
62309.144	20672.068	31.041	HUB600
62387.317	20678.007	35.336	HUB601
62343.481	20675.965	32.755	HUB602
62259.998	20675.597	28.863	HUB603
62196.419	20681.633	19.399	HUB604
62545.002	20669.691	39.377	HUB606
62687.072	20680.321	37.308	HUB607
62469.427	20676.207	39.058	HUB608
62636.631	20678.169	35.848	HUB609
62808.205	20677.690	47.129	HUB610
62884.507	20677.919	60.813	HUB611
62115.428	20915.984	4.848	HUB612
62116.210	20960.483	4.846	HUB613
62116.664	21003.528	5.006	HUB614
62117.223	21045.765	4.655	HUB615
62117.942	21091.212	4.372	HUB616
62121.333	21134.380	3.977	HUB617
62574.285	20909.186	15.206	HUB618
62513.738	20896.516	13.777	HUB619
62386.136	20879.743	10.607	HUB620
62342.211	20877.448	9.147	HUB621
62232.775	20870.754	6.287	HUB622
62171.128	20875.197	5.335	HUB623

GILLEY TRAIL

W 1364

Legend

	Proposed	Existing
STORM SEWER	ST	ST
SAN SEWER	SAN	SAN
GAS	G	G
WATER	W	W
UG ELECTRIC	BCH	BCH
UG TELEPHONE	BCT	BCT
VALVE		
MANHOLE		

DITCH
UTILITY POLE
FIRE HYDRANT
IRON PIN ● IP
BASEMENT ELEV
EDGE OF PVMT
INTEG SURVEY MON
SURVEY HUB

STORM INLET TYPES :- I II III IV

UMA Engineering Ltd.
Engineers & Planners
British Columbia Alberta Saskatchewan Manitoba Ontario Yukon Territory Northwest Territories

REV'N	DATE	DR'N	CH'D	
2	92/03/09	JR	MLB	AS RECORDED FB 561 / PG 7-8
1	91/06/24	E.A.	MLB	FOR TENDER
0	91/06/21	J.R.	MLB	FOR APPROVAL

DISTRICT OF COQUITLAM Engineering Department

DESIGNED – M.L.B
DRAWN – A.F./J.R.
METRIC H= 1:500 SCALE – V= 1:50
APPROVED–
DATE – 91-06-21

1991 WATER IMPROVEMENTS
GILLEY TRAIL
1+00 TO 3+60

FILE –
CONSULTANTS DWG No. – 0785-016
DISTRICT DWG No. –
SHEET 11 OF 18

DWG. FILE : COQUITLAM\GILLEY\GILLEY1.DWG

IMPORTANT:
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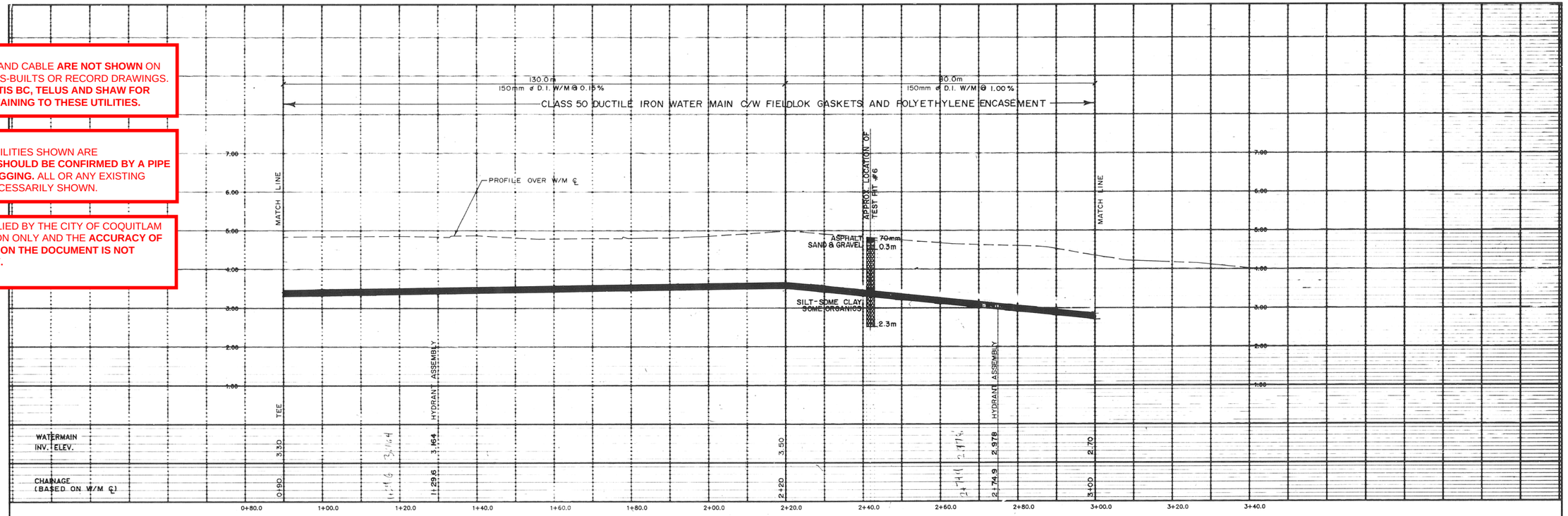
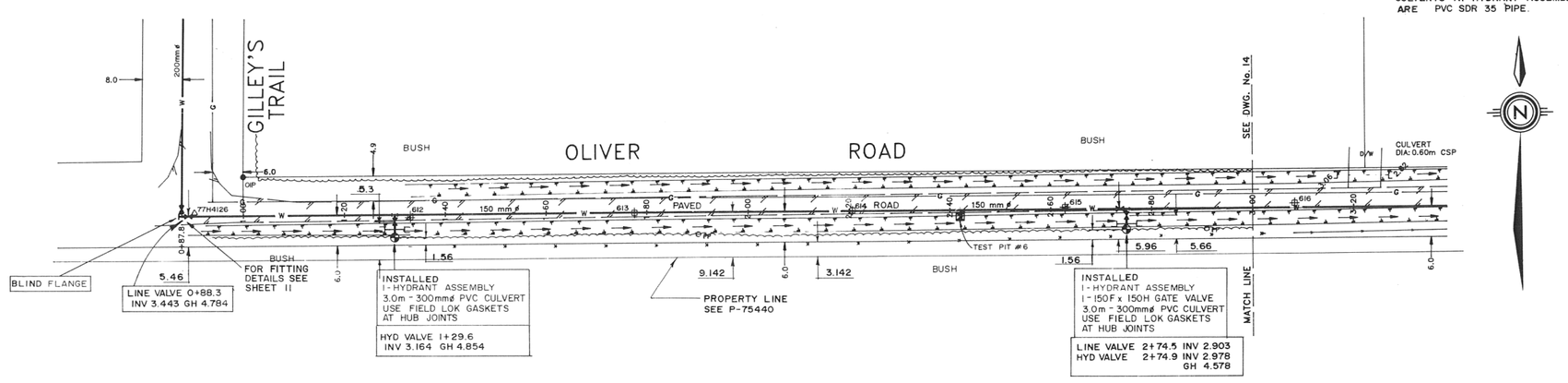


NOTE:
WATERMAIN ON OLIVER ROAD IS CLASS 50 DUCTILE IRON WITH FIELD LOK GASKETS AND POLYETHYLENE ENCASEMENT.
WATERMAIN TRENCHES ARE BACKFILLED WITH RIVER SAND AS SPECIFIED.
CULVERTS AT HYDRANT ASSEMBLIES ARE PVC SDR 35 PIPE.



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62232.775	20870.754	6.287	HUB622
62171.128	20875.197	5.335	HUB623

OLIVER ROAD

W 1366

Legend

	Proposed	Existing
STORM SEWER	ST	ST
SAN SEWER	SAN	SAN
GAS	G	G
WATER	W	W
UG ELECTRIC	BCH	BCH
UG TELEPHONE	BCT	BCT
VALVE		
MANHOLE		

DITCH
UTILITY POLE
FIRE HYDRANT
IRON PIN
BASEMENT ELEV
EDGE OF PVMT
INTEG SURVEY MON
SURVEY HUB

STORM INLET TYPES - I - II - III - IV -

UMA Engineering Ltd.
Engineers & Planners
British Columbia Alberta Saskatchewan Manitoba Ontario Yukon Territory Northwest Territories

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1	91/06/24	JR	MLB	FOR TENDER
0	91/06/21	RD	MLB	FOR APPROVAL

DISTRICT OF COQUITLAM Engineering Department

DESIGNED - M.L.B.
DRAWN - A.F./R.D.
METRIC H= 1:500 SCALE - V= 1:50
APPROVED -
DATE - 91-06-21

1991 WATER IMPROVEMENTS
OLIVER ROAD
0+87 TO 3+00

FILE -
CONSULTANTS DWG No. - 0785-016
DISTRICT DWG No. -
SHEET 13 OF 18

DWG. FILE : COQUITLU\OLIVER\OLIVER1.DWG

VICTORIA DRIVE

SEE TIE-IN DETAIL BELOW

1 – 200mmØ GATE VALVE COQUITLAM DWG F-3-2

150mm W/M

88mm GAS

RBCL MON 77H4116

B.C.H. R/W PLAN 57948

25 PLAN 31982

1 – 200mmØ GATE VALVE COQUITLAM DWG F-3-2 FLANGED TO HYDRANT TEE

HYDRANT ASSEMBLY AS PER COQUITLAM DWG F-3-4.

REM. 1 PLAN 16742

2 PLAN 16742

FREEMONT DR.

REM. F EXP. PLAN 14577 #4105

MATCH LINE STA. 3+60 SHEET 2

PARTINGTON CREEK

25mmØ SERVICE CONN. COQUITLAM DWG F-3-7 (TYPICAL)

CEDAR DRIVE

MON. 77H4118

1+00 200 mm DIA W/M

2+00

3+00

200 mm DIA W/M

MON 77H4117

CITY OF COQUITLAM

CITY OF PORT COQUITLAM

LOWER VICTORIA DRIVE

4m–450mmØ ULTRA RIB CULVERT

WATERMAIN DEFLECTED TO MATCH EXISTING W/M OFFSET AT TIE-IN. MAX 2.5 DEG DEFLECTION PER JOINT.

1 – TYT x FLG 45 DEG HORIZ BEND
1– FLG x TYT 11.25 DEG HORIZ BEND

DE BOALLE SLOUGH

CITY OF PORT COQUITLAM
CITY OF COQUITLAM

WATER SERVICE INSTALLED FOR 4100 CEDAR DRIVE

22.15
21.65
0.95
6.60
7.00
19.173
1.65
0.10
1.30
11.25
0.20
41.25
3.00
57.10
11.15

2.0 1.5

150 x 150 x 150 TEE

1–200mm HxH VALVE

1–150 x 200 HxH REDUCER

TIE-IN DETAIL
NTS

MATERIAL LIST

PIPE	PACIFIC STATE D.I. C350-50
HYDRANTS	TC P20 SLIDE GATE
SADDLES	SMITH BLAIR
FITTINGS	BRASS – MUELLER CAST – AGS
GATE VALVES	MUELLER

NOTES:

1.) ALL WATERMAINS AND APPURTENANCES ARE DUCTILE IRON CLASS 50.

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GROUND OVER WATERMAIN

EXIST. GAS

150 x 200 INCREASER GATE VALVE

HYDRANT TEE GATE VALVE

2500mm CONC. CULV.

HORIZ. BEND

39.96m – 200mm DIA D.I. W/M @ –6.900%	24.587	0+40 0+60 0+80 0+85.000
40.00m – 200mm DIA D.I. W/M @ –7.746%	21.489	1+00 1+20 1+25.000
45.00m – 200mm DIA D.I. W/M @ –10.149%	16.922	1+40 1+60 1+70.000
80.00m – 200mm DIA D.I. W/M @ –13.278%	6.300	1+80 2+00 2+20 2+40 2+50.000
25.00m – 200mm DIA D.I. W/M @ –10.00%	3.800	2+60 2+75.000
27.50m – 200mm DIA D.I. W/M @ –3.380%	2.870	2+80 3+00 3+02.500
97.50m – 200mm DIA D.I. W/M C/W "FIELD LOC" GASKETS AND POLYETHELYNE ENCASEMENT @ 0.430%		3+16.080 3+20 3+40 3+60

WATERMAIN INVERTS, LENGTHS AND GRADES

CHAINAGE

COQUITLAM AS-BUILT No. W1961-01

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

THIS DRAWING HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES. McELHANNEY CONSULTING SERVICES LTD., ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS ACCEPT NO RESPONSIBILITY TO ANY OTHER PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, FOR LOSS OR LIABILITY INCURRED AS A RESULT OF THEIR USE OF TI-ESE DRAWINGS.

LEGAL DESCRIPTION OF PROPERTY

BENCHMARKS
All elevations refer to Coquitlam
Monument No.: 77H4118
Elevation 3.811 m.

McElhanney
McElhanney Consulting Services Ltd.
13160–88 Ave., Surrey, B.C. V3W 3K3
Tel. (604)596–0391 Fax(604)596–8853

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. Y. M. HO

CITY OF COQUITLAM
3000 GUILDFORD WAY, COQUITLAM, BC V3B 7N2 TEL. 604-927-3000 FAX: 604-927-3015

CEDAR DRIVE WATERMAIN
VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

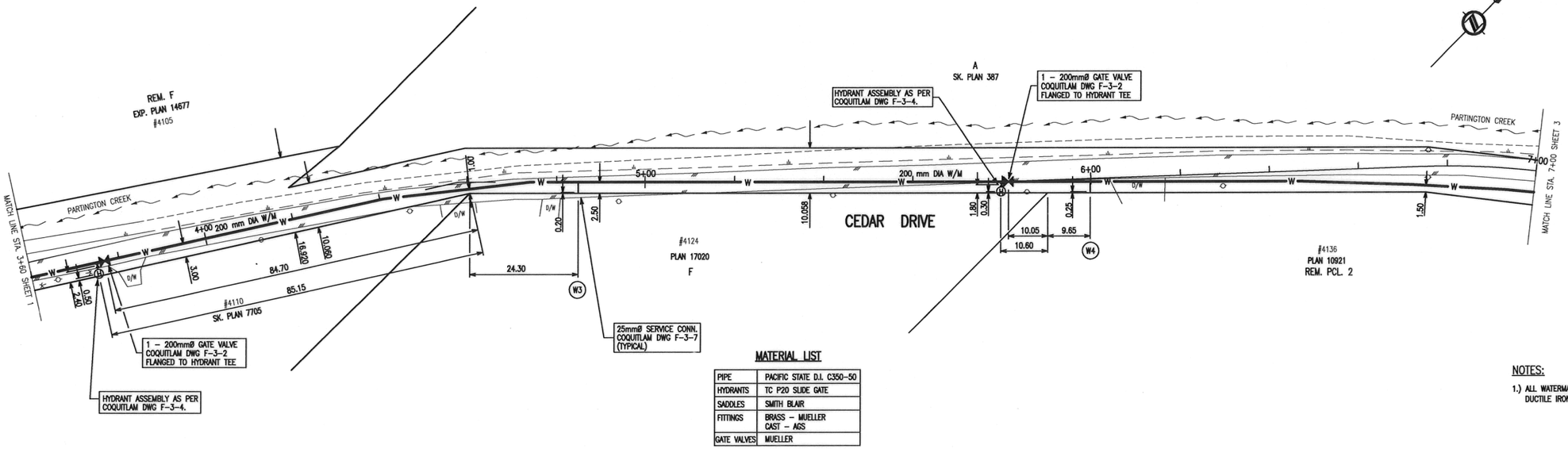
Scale	Horiz. 1:500 Vert. 1:50
Drawn	LRP/HS
Checked	
Designed	G.S.
Checked	
Approved	E.H.

City Project No. C 96845-1
City Drawing No.
Job No. 2111-01887-0
Date APRIL 2002

Drawing No. 1 of 6
Revision 2

20 NOV 2002 m:\proj\2111-01887 cedar dr\for-constructed\wheel1.dgn

Destroy all prints/drawings previous to this date

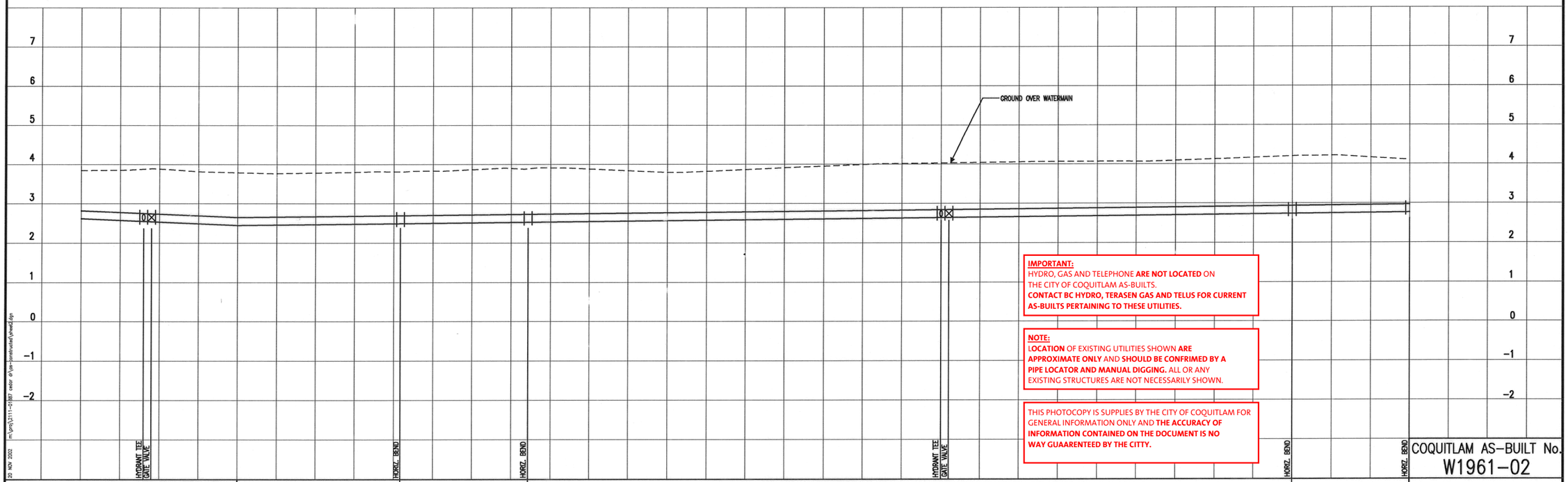


MATERIAL LIST

PIPE	PACIFIC STATE D.I. C350-50
HYDRANTS	TC P20 SLIDE GATE
SADDLES	SMITH BLAIR
FITTINGS	BRASS – MUELLER CAST – AGS
GATE VALVES	MUELLER

NOTES:

1.) ALL WATERMAINS AND APPURTENANCES ARE DUCTILE IRON CLASS 50.



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CONTACT BC HYDRO, TERASEN GAS AND TELUS FOR CURRENT AS-BUILTS PERTAINING TO THESE UTILITIES.

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97.50m – 200mm DIA D.I. W/M C/W "FIELD LOC" GASKETS AND POLYETHELYNE ENCASEMENT @ 0.430%

355.00m – 200mm DIA D.I. W/M C/W "FIELD LOC" GASKETS AND POLYETHELYNE ENCASEMENT @ 0.110%

3+60 3+80 4+00 4+20 4+40 4+47.71 4+60 4+74.35 4+80 5+00 5+20 5+40 5+60 6+00 6+20 6+40 6+60 6+70.000 6+80 7+00.000

CHAINAGE

WATERMAIN INVERTS, LENGTHS AND GRADES

COQUITLAM AS-BUILT No.
W1961-02

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

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LEGAL DESCRIPTION OF PROPERTY

BENCHMARKS
All elevations refer to Coquitlam Monument No.: 77H4118
Elevation 3.811 m.

McElhanney
McElhanney Consulting Services Ltd.
13160–88 Ave., Surrey, B.C. V3W 3K3
Tel. (604)596–0391 Fax(604)596–8853

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. Y. M. HO

CITY OF COQUITLAM
3000 GUILDFORD WAY, COQUITLAM, BC V3B 7N2 TEL. 604-927-3000 FAX: 604-927-3015

CEDAR DRIVE WATERMAIN
VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

Scale	Horiz. 1:500 Vert. 1:50
Drawn	LRP/HS
Checked	
Designed	G.S.
Checked	
Approved	E.H.

City Project No. C 96845-1
City Drawing No.
Job No. 2111-01887-0
Date APRIL 2002

2 of 6
Revision 2

Destroy all prints to technology previous to and date

ASB 9

IMPORTANT:
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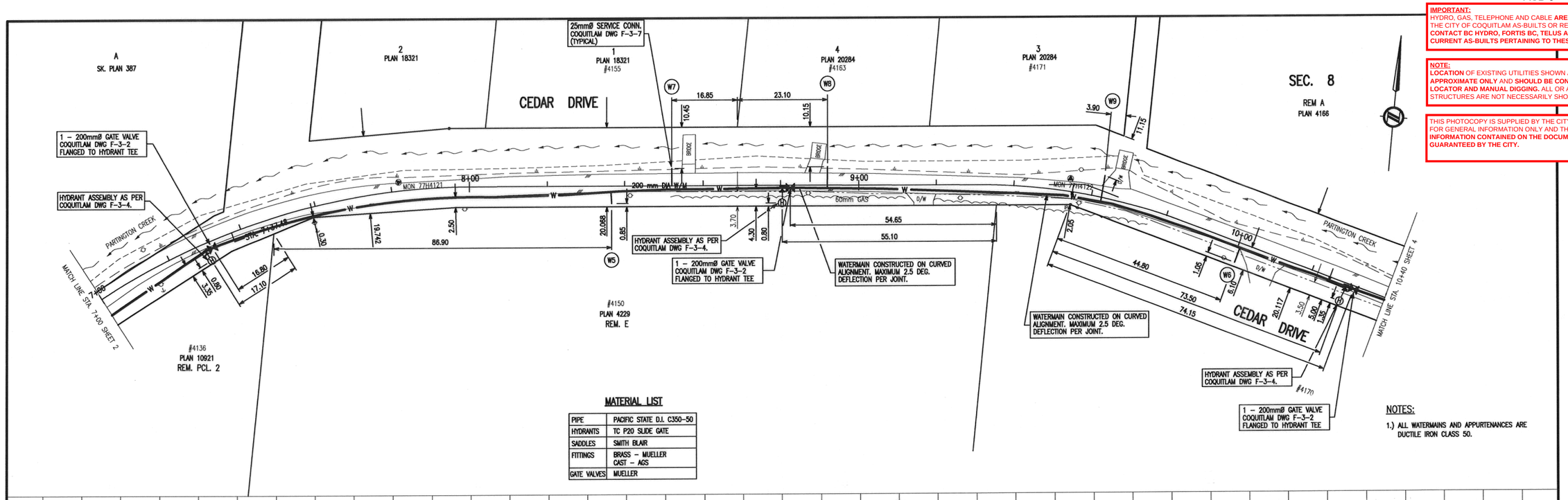
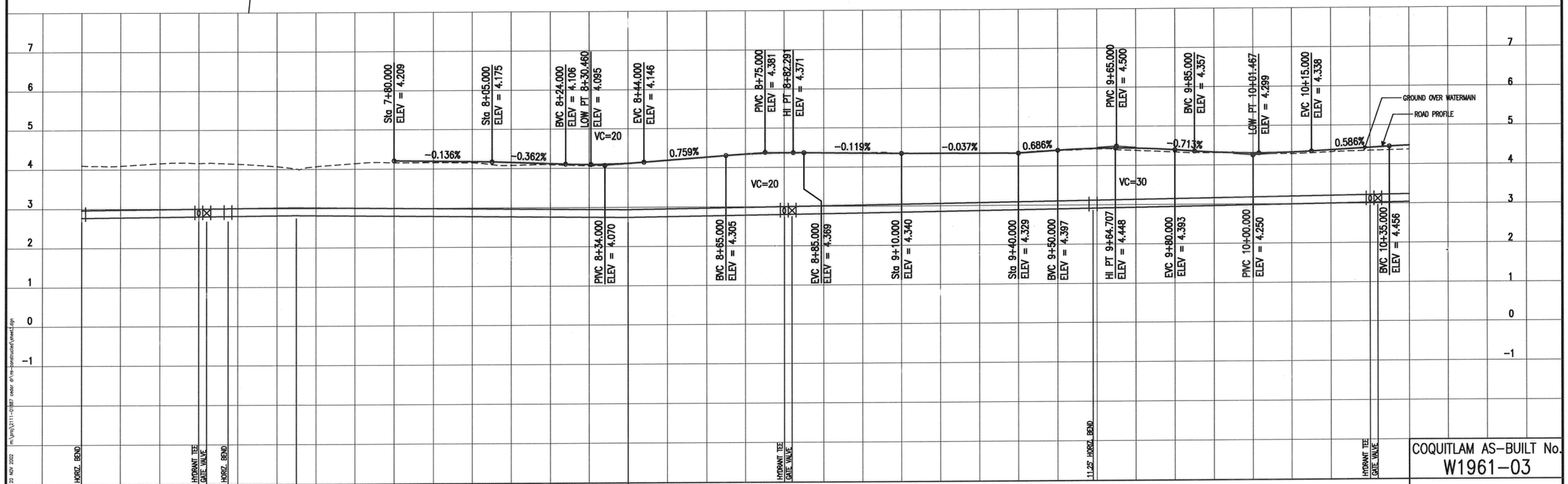


MATERIAL LIST

PIPE	PACIFIC STATE D.I. C350-50
HYDRANTS	TC P20 SLIDE GATE
SADDLES	SMITH BLAIR
FITTINGS	BRASS – MUELLER CAST – AGS
GATE VALVES	MUELLER

NOTES:

1.) ALL WATERMAINS AND APPURTENANCES ARE DUCTILE IRON CLASS 50.



COQUITLAM AS-BUILT No.
W1961-03

WATERMAIN INVERTS, LENGTHS AND GRADES

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

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LEGAL DESCRIPTION OF PROPERTY

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Elevation 3.811 m.

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CITY OF COQUITLAM
3000 GUILDFORD WAY, COQUITLAM, BC V3B 7N2 TEL. 604-927-3000 FAX: 604-927-3015

CEDAR DRIVE WATERMAIN
VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

Scale	Horiz. 1:500 Vert. 1:50
Drawn	LRP/HS
Checked	
Designed	G.S.
Checked	
Approved	E.H.

City Project No. C 96845-1
City Drawing No.
Job No. 2111-01887-0
Date APRIL 2002

Drawing No. 3 of 6
Revision 2

Destroy all prints bearing previous revision

20 NOV 2002 I:\prj\2111-01887 roster d\rpt-construction\plan3.dgn

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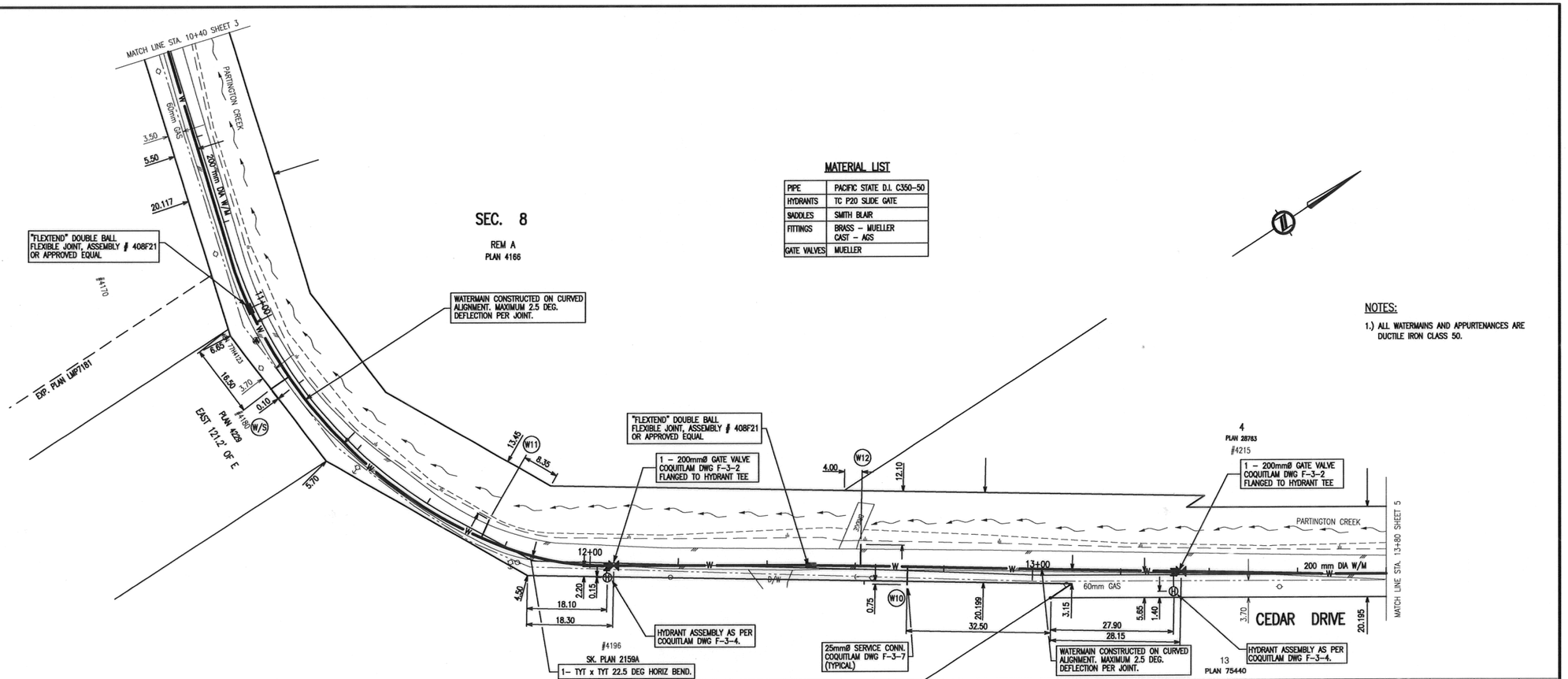

MATERIAL LIST

PIPE	PACIFIC STATE D.I. C350–50
HYDRANTS	TC P20 SLIDE GATE
SADDLES	SMITH BLAIR
FITTINGS	BRASS – MUELLER CAST – AGS
GATE VALVES	MUELLER

NOTES:

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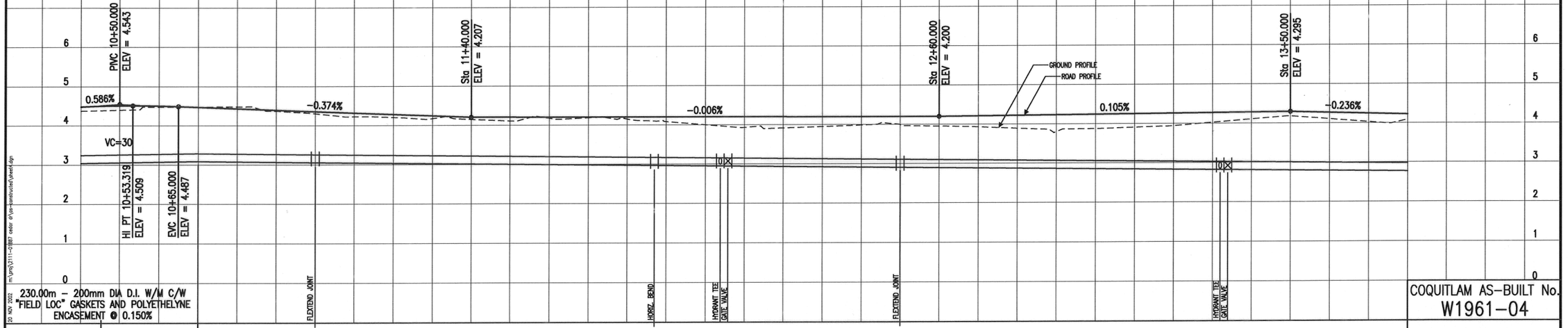

COQUITLAM AS–BUILT No.
W1961–04

WATERMAIN INVERTS, LENGTHS AND GRADES

CHAINAGE

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

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LEGAL DESCRIPTION OF PROPERTY

BENCHMARKS
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Monument No.: 77H4118
Elevation 3.811 m.

McElhanney
McElhanney Consulting Services Ltd.
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CITY OF COQUITLAM
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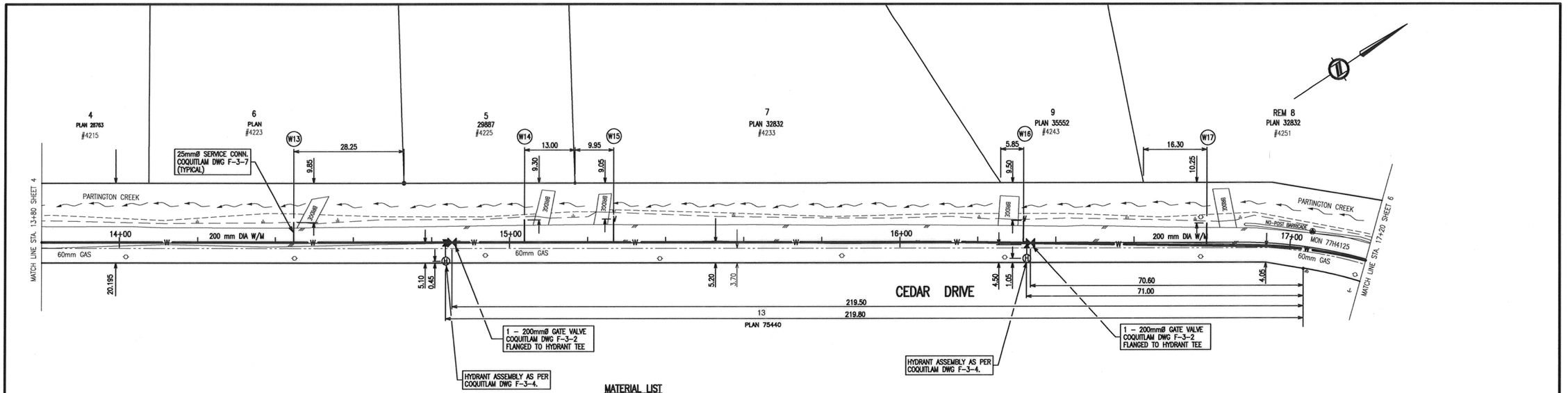
CEDAR DRIVE WATERMAIN
VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

Scale	Horiz. 1:500 Vert. 1:50
Drawn	LRP/HS
Checked	
Designed	G.S.
Checked	
Approved	E.H.

City Project No. C 96845–1
City Drawing No.
Job No. 2111–01887–0
Date APRIL
Drawing No. 4 of 6
Revision 2

20 NOV 2002 I:\proj\2111-01887 cedar dr\cs-plan\structure\plan4.dgn
Destroy all prints/cv/design prints as marked



MATERIAL LIST

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HYDRANTS	TC P20 SLIDE GATE
SADDLES	SMITH BLAIR
FITTINGS	BRASS – MUELLER CAST – AGS
GATE VALVES	MUELLER

NOTES:

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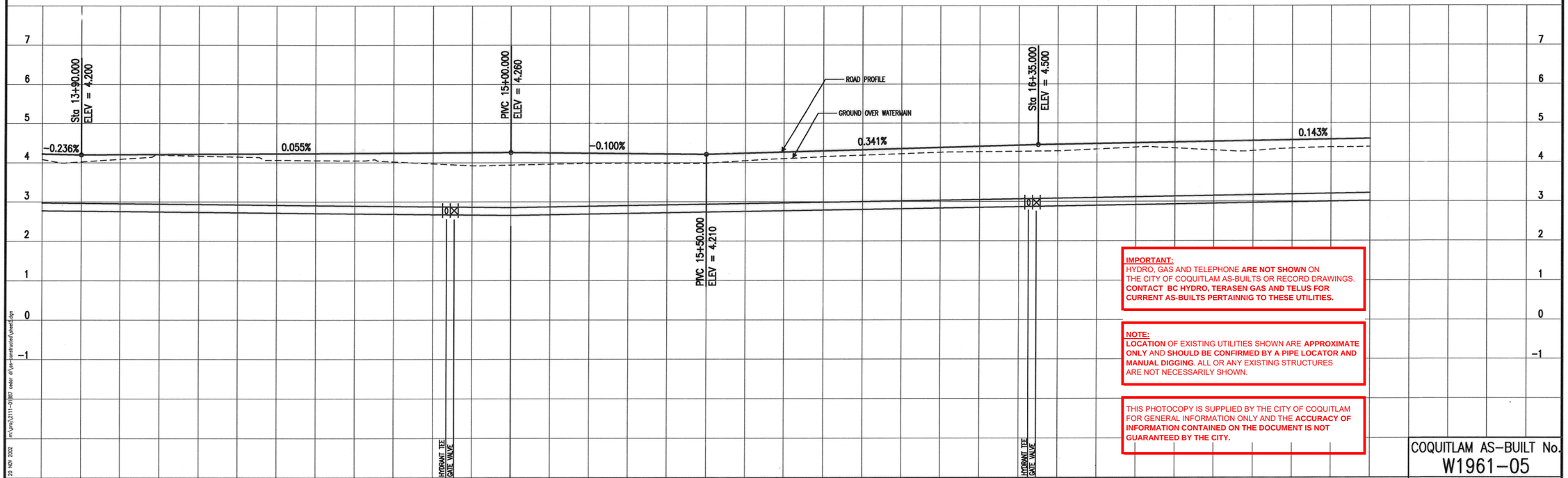

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COQUITLAM AS-BUILT No.
W1961-05

WATERMAIN INVERTS, LENGTHS AND GRADES

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

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Monument No.: 77H4118
Elevation 3.811 m.

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CITY OF COQUITLAM
3000 GUILDFORD WAY, COQUITLAM, BC V3B 7N2 TEL. 604-927-3000 FAX: 604-927-3015

CEDAR DRIVE WATERMAIN
VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

Scale	Horiz. 1:500 Vert. 1:50	
Drawn	LRP/HS	
Checked		
Designed	G.S.	
Checked		
Approved	E.H.	

City Project No. C 96845-1
City Drawing No.
Job No. 2111-01887-0
Date APRIL 2002

Drawing No. 5 of 6
Revision 2

Destroy all prints/technology/previous revisions

20 NOV 2002 m:\proj\2111-01887 cedar dr\pw_transcanada\plans\dgn

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MATERIAL LIST

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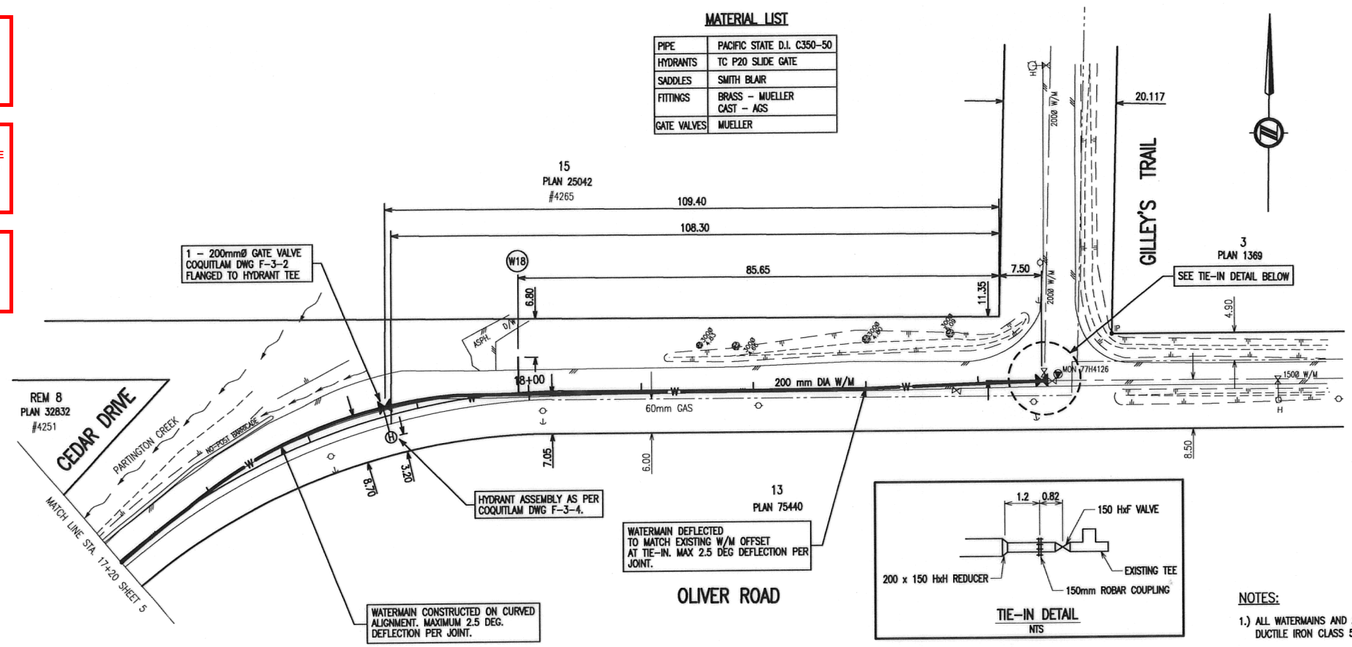
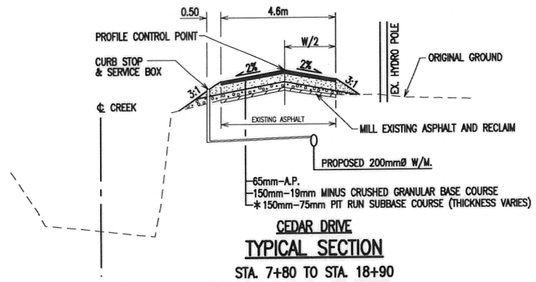
SADDLES	SMITH BLAIR
FITTINGS	BRASS - MUELLER CAST - AGS
GATE VALVES	MUELLER

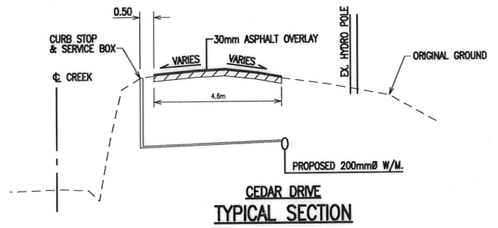


TIE-IN DETAIL
NTS

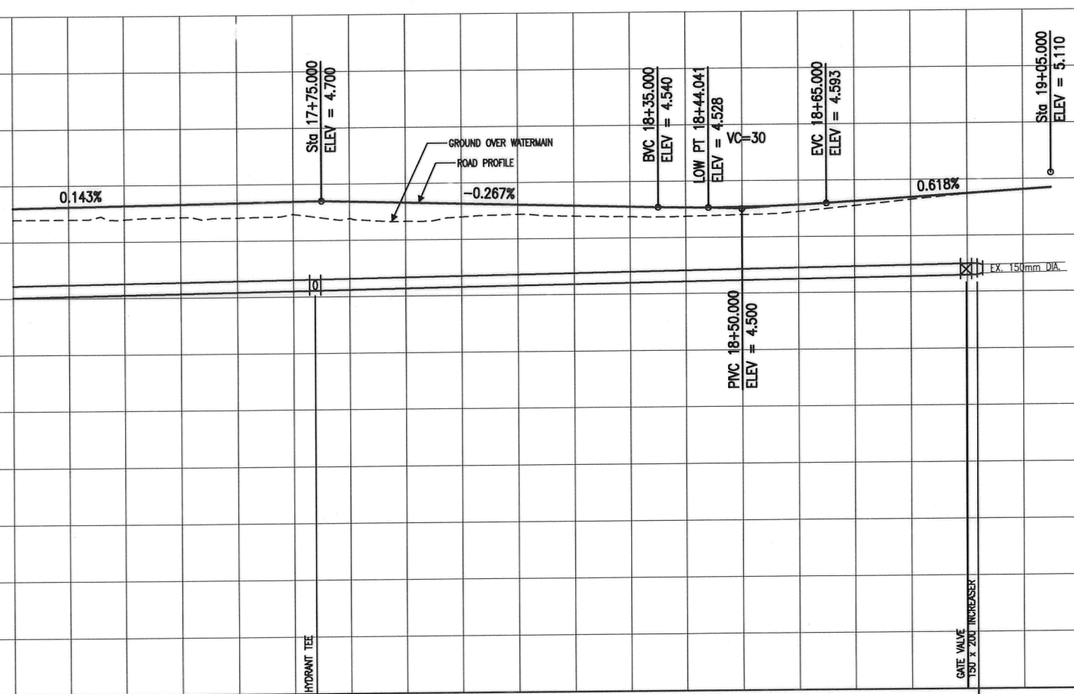
NOTES:
1.) ALL WATERMAINS AND APPURTENANCES ARE DUCTILE IRON CLASS 50.



CEDAR DRIVE
TYPICAL SECTION
STA. 7+80 TO STA. 18+90
* STA 7+80 TO 15+00 - NOT REQUIRED
* STA 15+00 TO 18+90 - VARIES 0mm TO 150mm
N.T.S.



CEDAR DRIVE
TYPICAL SECTION
STA. 3+00 TO STA. 7+80
N.T.S.



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COQUITLAM AS-BUILT No.
W1961-06

WATERMAIN INVERTS, LENGTHS AND GRADES

CHAINAGE

No.	Date	Revision	Dr	Ch
2	10/31/02	AS CONSTRUCTED SURVEY SUPPLIED BY CITY OF COQUITLAM	M.Z.	G.S.
1	04/06/02	REVISED TO CITY REQUIREMENTS.	H.S.	G.S.

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VICTORIA DRIVE TO GILLEY'S TRAIL
COQUITLAM, B.C.

Scale	Horiz. 1:500 Vert. 1:50
Drawn	LRP/HS
Checked	
Designed	G.S.
Checked	
Approved	E.H.

City Project No. C 96845-1
City Drawing No.
Job No. 2111-01887-0
Date APRIL 2002

Drawing No. 6 of 6
Revision 2

Destroy all prints to ensure proprietary rights are protected

Coquitlam

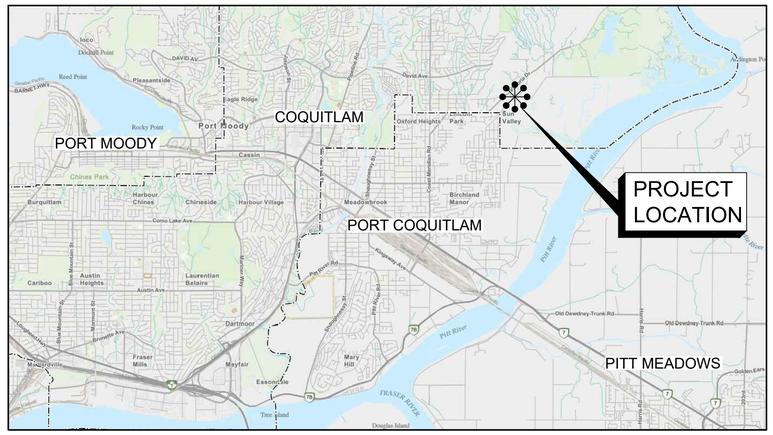
CEDAR DRIVE SANITARY

RECORD DRAWINGS

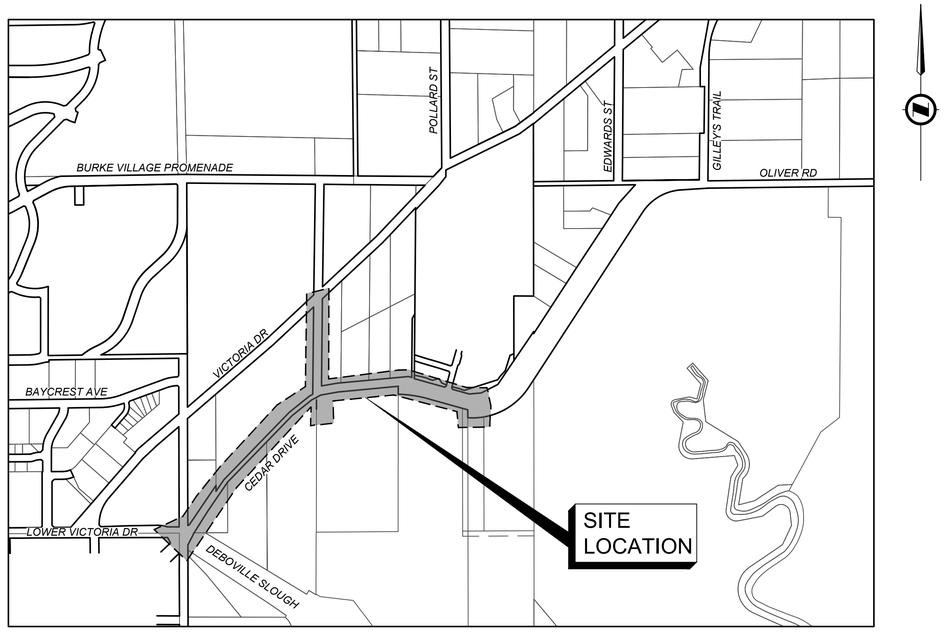
84490

CATEGORY	DRAWING SCHEDULE		
	DWG. NO.	SHEET TITLE	REV NO.
GENERAL	00	COVER	1
	01	GENERAL NOTES	1
SANITARY FORCEMAIN	02	SFM01 - STA 3+000 TO 3+280	1
	03	SFM02 - STA 3+280 TO 3+590	1
	04	SFM03 -STA 3+590 TO 3+900	1
SANITARY GRAVITY SEWER	05	SAN01 - FREEMONT EAST R.O.W.	1
	06	SAN02 - STA 0+000 TO 0+200	2
	07	SAN03 - STA 0+200 TO 0+400	3
PUMP STATION SITE	08	PS01 - PUMP STATION SITE PLAN	3
	09	PS02 - PUMP STATION GRADING PLAN	2
STRUCTURAL (VALVE CHAMBER & WET WELL)	10	STR01 - STRUCTURAL NOTES	1
	11	STR02 - CONCRETE - PLAN	1
	12	STR03 - CONCRETE - ELEVATIONS 1	1
	13	STR04 - CONCRETE - ELEVATIONS 2	1
	14	STR05 - CONCRETE - SECTIONS 1	1
	15	STR06 - CONCRETE - SECTIONS 2	1
	16	STR07 - DETAILS	1
	17	STR08 -DETAILS 2	1
	18	STR09 - REINFORCING - PLAN	1
	19	STR10 - REINFORCING - ELEVATIONS 1	1
	20	STR11 - REINFORCING - ELEVATIONS 2	1
	21	STR12 - REINFORCING - SECTIONS 1	1
	22	STR13 - REINFORCING - SECTIONS 2	1
MECHANICAL	23	PR01 - PUMP STATION P&ID	0
	24	PR02 - PUMP STATION PLANS	0
	25	PR03 - PUMP STATION SECTIONS	0
	26	PR04 - PUMP STATION MISC DETAILS 1	0
	27	PR05 - PUMP STATION MISC DETAILS 2	0
	28	ME01 - PUMP STATION ODOUR CONTROL	0
	29	ME02 - SANITARY PUMP HOUSE PLAN	0
	30	ME03 - SANITARY PUMP HOUSE SECTIONS	0
	31	ME04 - SANITARY PUMP HOUSE SPECS	0
ELECTRICAL	32	EL01 - LEGEND	0
	33	EL02 - SLD	0
	34	EL03 - SITE PLAN	0
	35	EL04 - BLDG. LAYOUT	0
	36	EL05 - CONDUIT SCHEDULE (POWER)	0
	37	EL06 - CONDUIT SCHEDULE (CONTROL)	0
	38	EL07 - COMM. DIAGRAM	0
	39	EL08 - CONTROL PANEL LAYOUT	0
	40	EL09 - PUMP WIRING	0
	41	EL10 - EQUIPMENT WIRING	0
	42	EL11 - CONTROLS SCHEM.	0
	43	EL12 - CONTROLS SCHEM.	0
	44	EL13 - CONTROLS SCHEM.	0
	45	EL14 - CONTROLS SCHEM.	0
	46	EL15 - IO INDEX	0
	47	EL16 - PJB-001	0
	48	EL17 - PJB-002	0
	49	EL18 - CJB-001	0
	50	EL19 - DETAILS	0

CATEGORY	DRAWING SCHEDULE		
	DWG. NO.	SHEET TITLE	REV. NO.
STRUCTURAL (PUMP STATION ELECTRICAL BUILDING)	S0.0	COVER SHEET	2
	S1.0	GENERAL NOTES (1 OF 2)	2
	S1.1	GENERAL NOTES (2 OF 2)	2
	S1.2	TYPICAL DETAILS	2
	S2.0	FOUNDATION PLAN	2
	S2.1	ROOF FRAMING PLAN	2
	S3.0	BUILDING SECTIONS	2
	S4.0	SECTIONS & DETAILS	2
ARCHITECTURAL (PUMP STATION ELECTRICAL BUILDING)	A0.00	COVER SHEET	
	A1.01	FLOOR PLAN	
	A1.02	REFLECTED CEILING PLAN	
	A1.03	ROOF PLAN	
	A2.01	BUILDING SECTIONS	
	A3.01	BUILDING ELEVATIONS	
	A3.02	BUILDING ELEVATIONS	
	A6.01	SCHEDULES	



LOCATION PLAN
NTS



SITE PLAN
NTS

REV. 1
May 2024

ISL
#201 - 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

GENERAL NOTES:

1. ELEVATIONS ARE RELATIVE TO CVD28GVRD. HORIZONTAL COORDINATES ARE IN LOCAL PROJECT GROUND COORDINATES.
2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE PLATINUM EDITION (2009) OF THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) AND MMCD SUPPLEMENTARY UPDATES TO DATE AND CITY OF COQUITLAM SUPPLEMENTARY SPECIFICATIONS AND DETAIL DRAWINGS UNLESS OTHERWISE NOTED.
3. RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION SHALL BE GIVEN AT LEAST 5 DAYS NOTICE PRIOR TO THE START OF CONSTRUCTION. IF CONSTRUCTION ENTERS ONTO PRIVATE PROPERTY, THE CONTRACTOR WILL REQUIRE WRITTEN AUTHORIZATION FROM THE PROPERTY OWNER PRIOR TO UNDERTAKING ANY WORK.
4. THE LOCATION OF EXISTING UTILITIES IS COMPILED FROM OWNER AND UTILITY SUPPLIED RECORD DRAWINGS AND ARE CONSIDERED APPROXIMATE ONLY. THE EXACT LOCATION AND EXTENT OF UTILITIES SHOULD BE DETERMINED BY CONSULTING THE LOCAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND INVERT ELEVATION BY HAND OR HYDROVAC EXCAVATION BEFORE CONSTRUCTION OF UTILITY CROSSINGS AND SHALL BE RESPONSIBLE FOR RESTORATION OF ANY DAMAGE TO EXISTING UTILITIES. ANY COSTS ASSOCIATED WITH UTILITY CONFLICTS THAT WERE NOT PRELOCATED WILL BE THE CONTRACTORS RESPONSIBILITY.
5. EXISTING UTILITY TRENCHES ADJACENT TO THE PROPOSED UNDERGROUND UTILITY ARE TO BE ADEQUATELY PROTECTED FROM SLOUGHING IN ORDER TO PREVENT OVER-WIDTH EXCAVATION.
6. THE CONTRACTOR IS TO NOTIFY THE CITY OF COQUITLAM 48 HOURS IN ADVANCE OF ANY CONSTRUCTION OR UTILITY RELOCATION/CONFLICTS.
7. REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR A MIN 72 HOURS PRIOR TO CONSTRUCTION.
8. RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION OF THE PROJECT AND/OR SCHEDULED SERVICE DISRUPTION, INCLUDING ROAD & DRIVEWAY BLOCKAGES, MUST BE GIVEN A MINIMUM OF 48 HOURS WRITTEN NOTICE OF THE PROPOSED CONSTRUCTION START.
9. ALL SURVEY MONUMENTS WITHIN THE PROJECT BOUNDARIES SHALL BE PROTECTED DURING THE COURSE OF THE WORK. SHOULD ANY SURVEY MONUMENT REQUIRE RAISING OR RELOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEERING AND OPERATIONS DEPARTMENT AT LEAST 72 HOURS IN ADVANCE OF SCHEDULING WORK. ALL DISTURBED MONUMENTS WILL BE REPLACED BY A B.C. LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
10. SURVEY PINS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE REPLACED BY A B.C. LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
11. ALL PUBLIC ROADWAYS AFFECTED BY THE WORKS SHALL BE KEPT IN A CLEAN STATE AT ALL TIMES. DUST CONTROL MEASURES SHALL ALSO BE EMPLOYED DURING THE COURSE OF THE WORK.
12. ALL PAVEMENT RESTORATION AS PER MMCD.
13. SEE CITY SUPPLEMENTARY SPECIFICATIONS FOR ALL PIPE BEDDING AND TRENCH BACKFILL REQUIREMENTS, COMPACTED IN LIFTS TO 95% MODIFIED PROCTOR.
14. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, AND FOR COORDINATING THE VARIOUS PARTS OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THERE IS NO DISRUPTION TO SERVICE, AND IF DISRUPTION IS ANTICIPATED, TO NOTIFY THE CONTRACT ADMINISTRATOR A MINIMUM OF 72 HOURS PRIOR, AND OBTAIN APPROVAL FOR THE DISRUPTION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL EXCAVATED MATERIAL UNSUITABLE FOR REUSE AT A SUITABLE OFF-SITE DISPOSAL AREA, IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
16. THE CONTRACTOR SHALL PROVIDE TEMPORARY UTILITY POLE SUPPORTS NECESSARY TO COMPLETE THE WORKS AS AN INCIDENTAL ITEM TO GENERAL CONTRACT REQUIREMENTS WHERE AND AS REQUIRED.
17. CONTRACTOR TO MAINTAIN AN UP TO DATE SET OF AS-CONSTRUCTED DRAWINGS AT ALL TIMES. AS-CONSTRUCTED DRAWINGS TO BE DELIVERED TO THE CONTRACT ADMINISTRATOR AT SUBSTANTIAL PERFORMANCE FOR PREPARATION OF FINAL RECORD DRAWINGS. THE CONTRACT ADMINISTRATOR SHALL BE PROVIDED ACCESS TO REVIEW THE AS-CONSTRUCTED DRAWINGS AT ALL TIMES TO CONFIRM THEY ARE UP TO DATE.
18. THE CONTRACTOR SHALL MAINTAIN AND MONITOR THE PROVISIONS FOR EROSION CONTROL AND SEDIMENT AS PER THE CITY BYLAW 4403, 2013 AND AS PER THE CONTRACT DOCUMENTS.
19. CONTRACTOR TO REPORT AND REPAIR OR REPLACE ANY DAMAGE TO THE SANITARY/STORM SERVICES DURING MAIN INSTALLATION. ANY DAMAGE TO WATER SERVICES IS TO BE REPORTED TO THE CONTRACT ADMINISTRATOR AND REPAIRED BY CITY FORCES AT THE CONTRACTOR'S EXPENSE.
20. CONTRACTOR TO PROTECT EXISTING UTILITIES FROM DAMAGE.
21. ALL EXISTING LIVE SERVICES SHALL BE MAINTAINED OPERATIONAL DURING CONSTRUCTION.
22. CONTRACTOR SHALL NOTIFY THE VARIOUS UTILITY AGENCIES AND OBTAIN PERMITS AS REQUIRED PRIOR TO CONSTRUCTION.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL CITY PERMITS FOR WORK WITHIN THE CITY ROAD ALLOWANCE.
24. ALL EXISTING SIGNAGE, BOULEVARDS, CURBS, UTILITIES, WALLS, LANDSCAPING, FENCES, PAINT MARKINGS AND SURFACES DISTURBED BY CONSTRUCTION TO BE RESTORED TO ORIGINAL CONDITION OR BETTER AND IN ACCORDANCE WITH THE CITY SPECIFICATIONS.
25. EVERY EFFORT IS TO BE MADE TO SAVE EXISTING LANDSCAPING WITHIN THE ROAD R.O.W.. LANDSCAPING IS TO BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION. IN THE EVENT OF LANDSCAPING REMOVAL, THE PROPERTY OWNER SHALL BE ADVISED OF THE REMOVAL AND THE LANDSCAPING PLACED ON OWNERS PROPERTY UPON THEIR REQUEST.
26. NOT ALL EXISTING LANDSCAPING MAY BE SHOWN ON THE DRAWINGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VIEW WORK AREAS AND PROVIDE REQUIRED ALLOWANCE TO RESTORE ALL EXISTING LANDSCAPING THAT IS DISTURBED BY THE WORKS TO EXISTING OR BETTER CONDITIONS FOLLOWING CONSTRUCTION.

TRAFFIC MANAGEMENT, NOTIFICATION AND APPROVALS NOTES:

1. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SIGNAGE, BARRIERS, FLASHING INDICATORS, ETC. AT ALL TIMES TO ENSURE THE SAFETY OF THE PUBLIC. THE CONTRACTOR SHALL COMPLY WITH ALL TRAFFIC REQUIREMENTS AS SPECIFIED WITHIN THE CONTRACT DOCUMENTS. NO ROAD SHALL BE CLOSED WITHOUT THE WRITTEN CONSENT OF THE DIRECTOR OF ENGINEERING AND OPERATIONS.
2. THE CONTRACTOR SHALL ENSURE THAT ALL APPROVALS REQUIRED FOR THE PROPOSED WORKS HAVE BEEN OBTAINED FROM ALL AUTHORITIES AND AGENCIES PRIOR TO COMMENCING THE WORK.
3. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE PERSONNEL AT LEAST 72 HOURS PRIOR TO THE WORK. SCHEDULING AND OTHER CONSTRUCTION CONSTRAINTS IMPOSED BY THESE WORKS SHALL BE TAKEN INTO ACCOUNT.
4. A TRAFFIC AND PEDESTRIAN SAFETY CONTROL PLAN SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO THE PRE-CONSTRUCTION MEETING.
5. APPROVALS FOR REQUIRED TREE CUTTING OR TRIMMING NOT INDICATED IN CONTRACT DRAWINGS SHALL BE OBTAINED BY THE CONTRACTOR FROM THE CITY PRIOR TO WORK BEING PERFORMED.
6. CONTRACTOR TO OBTAIN APPROVED LANE CLOSURE REQUEST FORM FOR ALL WORKS. APPROVED REQUESTS ARE CIRCULATED TO ALL EMERGENCY SERVICES.
7. CONTRACTOR TO SUBMIT A TRAFFIC MANAGEMENT PLAN WITH LANE CLOSURE REQUEST FOR ALL MAJOR ROADS AND ANY LOCAL ROADS WHICH REQUIRE ANY DETOURS.
8. ALL TRAFFIC CONTROL TO CONFORM TO THE LATEST EDITION OF THE BC TRAFFIC CONTROL MANUAL FOR WORK ON ROADWAYS.
9. APPROVAL OF NOISE VARIANCE FOR ALL WORK OUTSIDE OF NORMAL APPROVED WORK HOURS REQUIRED BY THE CITY.
10. NOTICE OF CONSTRUCTION SIGNS TO BE INSTALLED AT ALL PROJECT LIMITS AND PREFERRED DETOUR ROUTE. NOTIFY CONTRACT ADMINISTRATOR WITH CONSTRUCTION SCHEDULE AND LOCATIONS. SIGNS PROVIDED AND INSTALLED BY THE CONTRACTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETION OF ALL TAPED TEMPORARY AND PERMANENT PAINT AND THERMOPLASTIC PAVEMENT MARKINGS IN THE PLACE OF THE WORK. PERMANENT LANE MARKINGS ARE TO BE PLACED WITHIN SEVENTY-TWO (72) HOURS OF FINAL PAVING AND PERMANENT THERMOPLASTIC PAVEMENT MARKINGS ARE TO BE PLACED WITHIN FIVE (5) DAYS OF FINAL PAVING. ALL TEMPORARY MARKINGS TO BE REMOVED IMMEDIATELY FOLLOWING PLACEMENT OF PERMANENT PAVEMENT MARKINGS.
12. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE TRAFFIC MANAGEMENT DETAILED SPECIFICATIONS IN THE CONTRACT DOCUMENTS.

SANITARY SEWER NOTES:

1. NO CHANGES TO BE MADE TO PIPES, MANHOLES, OR ALIGNMENT WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR.
2. THE CONTRACTOR IS TO EXPOSE EXISTING WATERMAINS, STORM AND SANITARY SEWERS AT TIE-IN LOCATION AND ALL EXISTING UTILITIES BETWEEN. UTILITY DEPTHS AND LOCATIONS ARE TO BE RECORDED AND FORWARDED TO THE CONTRACT ADMINISTRATOR FOR REVIEW.
3. MINIMUM COVER OVER SANITARY SEWERS AND SERVICES ARE TO BE 1.2m RESPECTIVELY UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
4. SERVICE LOCATIONS SHOWN ARE APPROXIMATE ONLY AND ARE AVAILABLE ONLINE THROUGH CITY OF COQUITLAM GIS WEBSITE. CONFIRM SERVICE SIZE, LOCATION, AND ALL POTENTIAL UTILITY CONFLICTS PRIOR TO CONSTRUCTION.
5. ALL SEWER AIR TESTING & CCTV INSPECTIONS SHALL BE TO THE CITY OF COQUITLAM STANDARDS AND SPECIFICATIONS.
6. CONTRACTOR TO INCLUDE BYPASS PUMPING AS REQUIRED TO MAINTAIN 24/7 SERVICE TO ALL EXISTING PROPERTIES. THE CONTRACTOR SHALL PROVIDE A DETAILED FLOW BYPASS PLAN, ACCEPTABLE TO BOTH THE CITY AND CONTRACT ADMINISTRATOR FOR APPROVAL BEFORE STARTING CONSTRUCTION.
7. NEW SANITARY SEWER MANHOLES TO MMCD S1 AND S2 UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
8. CONTRACTOR TO FLUSH ALL SEWERS & SERVICES AND PERFORM CCTV INSPECTION UPON COMPLETION.
9. CONTRACTOR TO PROVIDE NEW BENCHING WHERE TIE-INS TO EXISTING MANHOLES IS REQUIRED.
10. ALL TIE-INS TO EXISTING MANHOLES ARE TO BE CORED c/w GROUT.
11. FIGURED DIMENSION SHALL GOVERN OVER SCALED DIMENSIONS.
12. REFER TO COQ STD. DWG. COQ-G4 FOR UTILITY TRENCH DETAIL.
13. SANITARY SEWER MATERIALS ARE TO CONFORM TO THE MMCD SPECIFICATIONS.
14. PVC PIPE SIZES INDICATED REFER TO MINIMUM INSIDE DIAMETER DIMENSIONS. HDPE PIPE SIZES REFER TO NOMINAL DIAMETER DIMENSIONS.
15. ALL PROPOSED SANITARY FORCEMAIN FITTINGS TO BE FLANGED OR ELECTRO FUSION COUPLER.

PLOT DATE: April 31, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
0	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

GENERAL NOTES
CEDAR DRIVE SANITARY

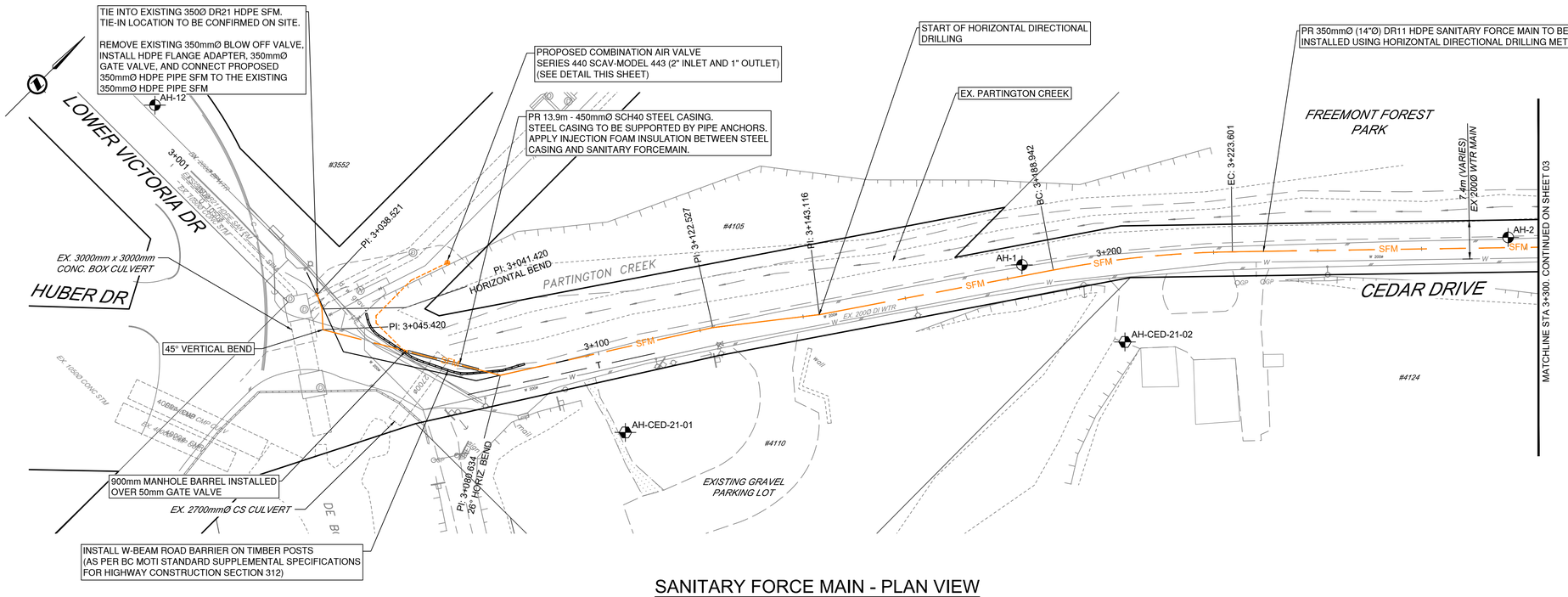
RECORD DRAWINGS DESIGN NO. 32628

ISL
#201 - 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	KPT/CJB
CHECKED BY	KPT/CJB	APPROVED BY	KPT

DWG. NO. 01 OF 50
REV. 1

File: \\isledmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_SAN_COVER_AND_NOTES.dwg



SANITARY FORCE MAIN - PLAN VIEW

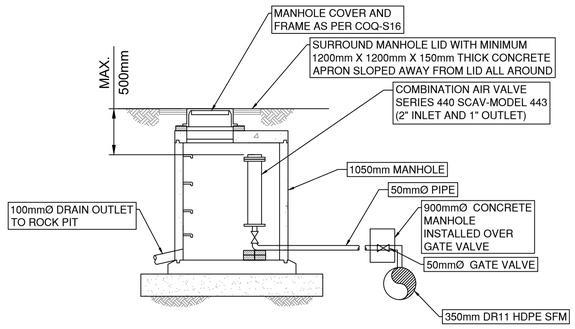
SCALE 1:500

LEGEND:

- AUGERHOLE / MONITORING WELL[1]
- AUGER DRILL HOLE[2]

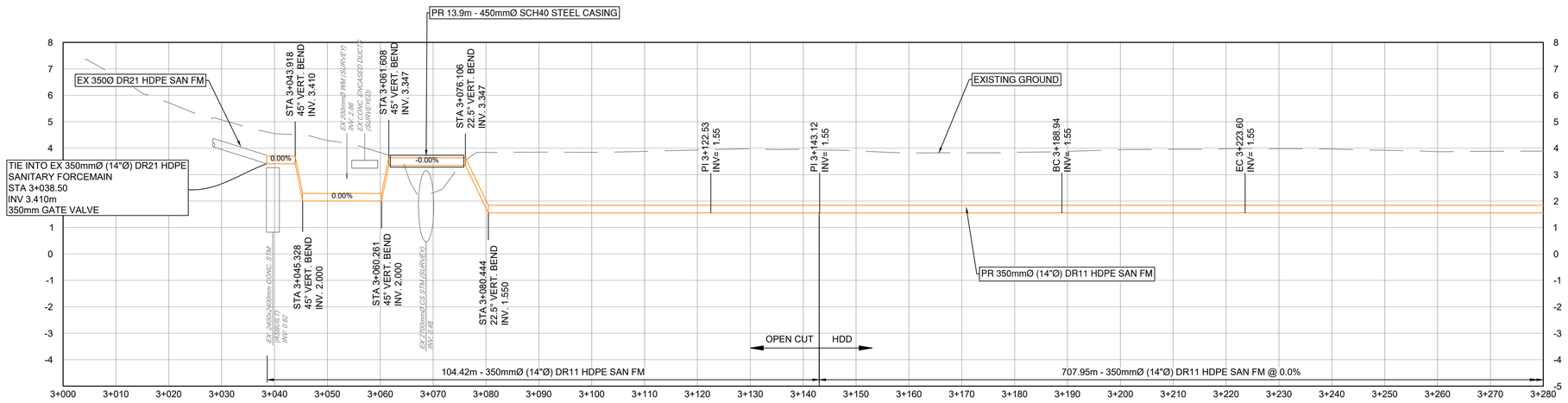
NOTES:
1: SEE GEOTECHNICAL ENGINEERING ASSESSMENT LETTER REPORTS (REF NO. VAN-00260722) PREPARED BY EXP SERVICES INC. DATED JANURARY 22, 2021 AND NOVEMBER 01, 2021 FOR DETAILS.

2: SEE SUPPLEMENTAL GEOTECHNICAL REPORT (FILE: 3937) PREPARED BY GEOPACIFIC CONSULTANTS LTD. DATED MARCH 12, 2002 FOR DETAILS.



COMBINATION AIR VALVE - DETAIL

NTS



SANITARY FORCE MAIN - PROFILE VIEW

SCALE 1:500H / 1:100V

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1:500

PLOT DATE: April 30, 2024

RECORD DRAWINGS DESIGN NO. 32628

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY FORCEMAIN

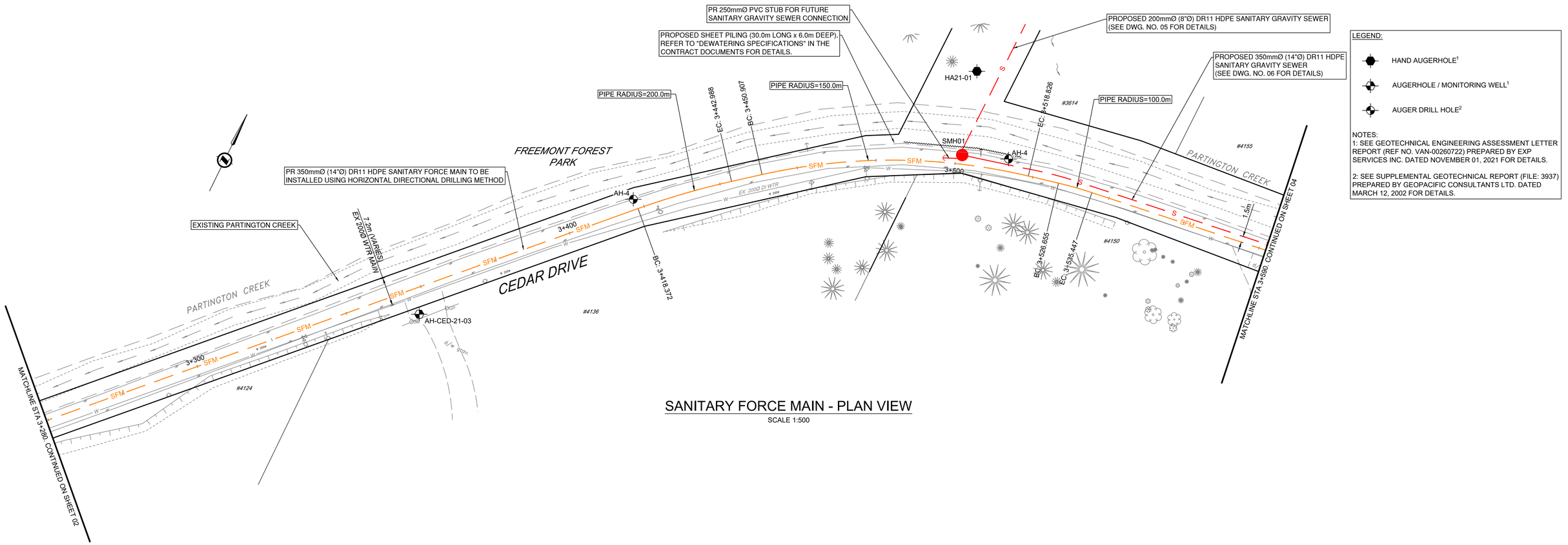
STA 3+000 TO 3+280
CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, 3999 Henning Dr, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

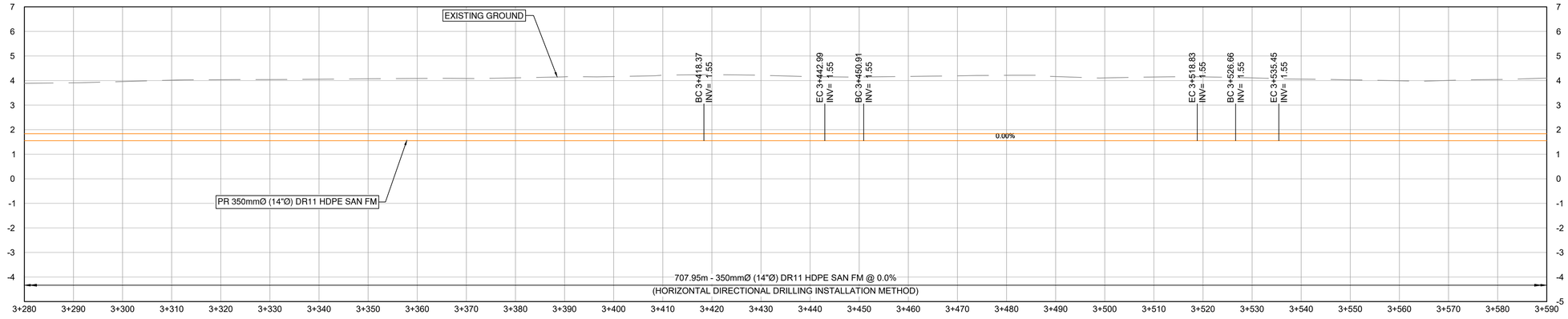
DWG. NO. 02 OF 50
REV. 1

File: \\iselesmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CAD\20_Drafting\203_Sheets\32628_SH_Sanitary_Forcemain.dwg



SANITARY FORCE MAIN - PLAN VIEW

SCALE 1:500



SANITARY FORCE MAIN - PROFILE VIEW

SCALE 1:500H / 1:100V

1:500 0 10 30m

RECORD DRAWINGS DESIGN NO. 32628

PLOT DATE: April 30, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY FORCEMAIN

STA 3+280 TO 3+590

CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, 3999 Henning Dr, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 03 OF 50 REV. 1

File: \\sledmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_Sanitary_Forcemain.dwg

PR 350mmØ (14"Ø) DR11 HDPE SANITARY FORCE MAIN TO BE INSTALLED USING HORIZONTAL DIRECTIONAL DRILLING METHOD

PR 350mmØ (14"Ø) DR11 HDPE SANITARY GRAVITY SEWER (SEE DWG. NO. ## TO ## FOR DETAILS)

EXISTING PARTINGTON CREEK

PROPOSED SHEET PILING (30.0m LONG x 9.0m DEEP). REFER TO "DEWATERING SPECIFICATIONS" IN THE CONTRACT DOCUMENTS FOR DETAILS.

PARTINGTON CREEK

CEDAR DRIVE

PIPE RADIUS=100.0m

EMERGENCY CONNECTION (SEE DETAIL THIS SHEET)

PIGGING CONNECTION (SEE DETAIL ON THIS SHEET)

NEW #4170 PROPERTY LINE / ROAD R.O.W. LIMITS

SANITARY FORCEMAIN PUMP STATION TIE-IN. FOR CONTINUATION SEE PUMP STATION MECHANICAL DRAWINGS.

PR. 1800mmØ MANHOLE (SEE "EFFLUENT FLOW METER CHAMBER DETAILS" ON DWG. NO. ##)

PR SANITARY PUMP STATION SITE. SEE DWG. NO. ## FOR DETAILS.

MATCHLINE STA 3+590 CONTINUED ON SHEET ##

AH-CED-21-04 AH-5 AH-6 AH20-07 AH20-06 AH-CED-21-05 AH-7

SMH03 PI. 3+870.178

BC: 3+595.850 EC: 3+627.405 BC: 3+689.426 EC: 3+723.469 PI: 3+851.063 37.2° HORIZ. BEND

3+500 3+700 3+800 3+895

1.5m

#4150 #4163 #4171 #4170 #4169 #4196 #4180

SANITARY FORCE MAIN - PLAN VIEW

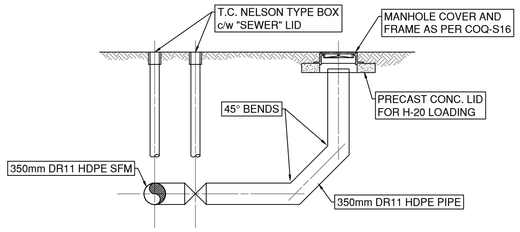
SCALE 1:500

LEGEND:

- AUGERHOLE / MONITORING WELL[1]
- AUGER DRILL HOLE[2]

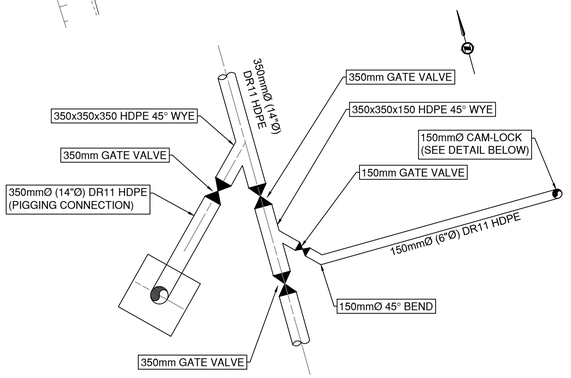
NOTES:
1: SEE GEOTECHNICAL ENGINEERING ASSESSMENT LETTER REPORTS (REF NO. VAN-00260722) PREPARED BY EXP SERVICES INC. DATED JANURARY 22, 2021 AND NOVEMBER 01, 2021 FOR DETAILS.

2: SEE SUPPLEMENTAL GEOTECHNICAL REPORT (FILE: 3937) PREPARED BY GEOPACIFIC CONSULTANTS LTD. DATED MARCH 12, 2002 FOR DETAILS.



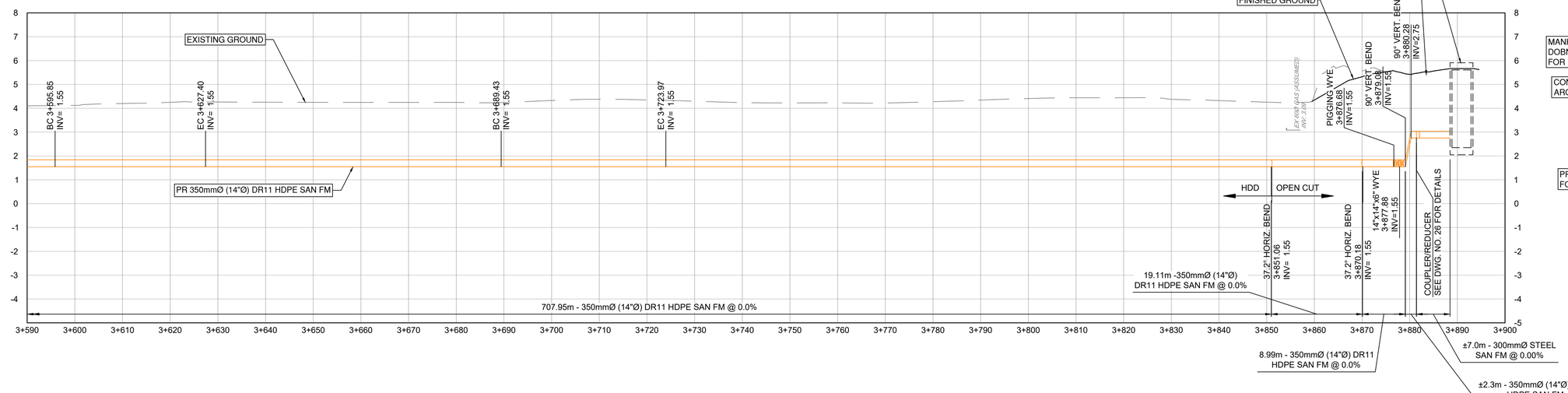
PIGGING CONNECTION - DETAIL ELEVATION VIEW

NTS



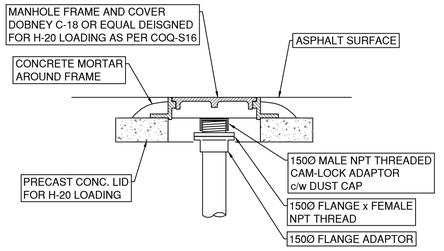
EMERGENCY CONNECTION DETAIL

NTS



SANITARY FORCE MAIN - PROFILE VIEW

SCALE 1:500H / 1:100V



EMERGENCY CONNECTION CAM-LOCK LID DETAIL

NTS

1:500 0 10 30m

PLOT DATE: April 30, 2024

RECORD DRAWINGS

DESIGN NO. 32628

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY FORCEMAIN

STA 3+590 TO 3+900

CEDAR DRIVE UPGRADES - PHASE 01

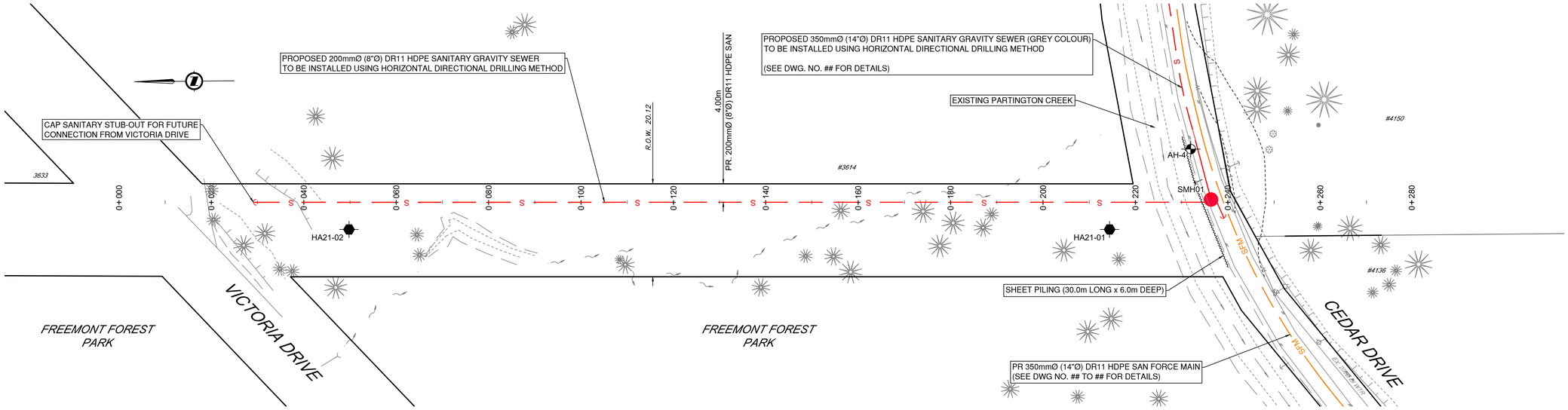
ISL
#201, 3999 Henning Dr, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 04 OF 50

REV. 1

File: \\eldmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_Sanitary_Forcemain.dwg



SANITARY GRAVITY SEWER - SITE PLAN

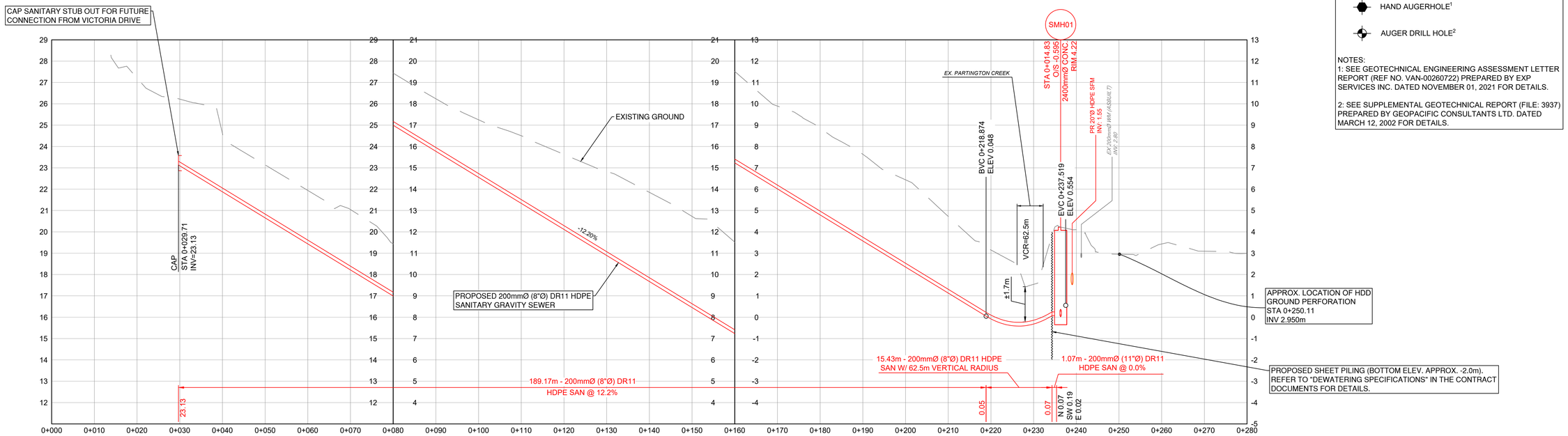
SCALE: 1:500

LEGEND:

- HAND AUGERHOLE[1]
- AUGER DRILL HOLE[2]

NOTES:
1: SEE GEOTECHNICAL ENGINEERING ASSESSMENT LETTER REPORT (REF NO. VAN-00260722) PREPARED BY EXP SERVICES INC. DATED NOVEMBER 01, 2021 FOR DETAILS.

2: SEE SUPPLEMENTAL GEOTECHNICAL REPORT (FILE: 3937) PREPARED BY GEOPACIFIC CONSULTANTS LTD. DATED MARCH 12, 2002 FOR DETAILS.



SANITARY GRAVITY SEWER - PROFILE VIEW

SCALE: 1:500H / 1:100V

1:500 0 10 30m

PRELIMINARY DESIGN DESIGN NO. 32628

PLOT DATE: May 2, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY SEWER

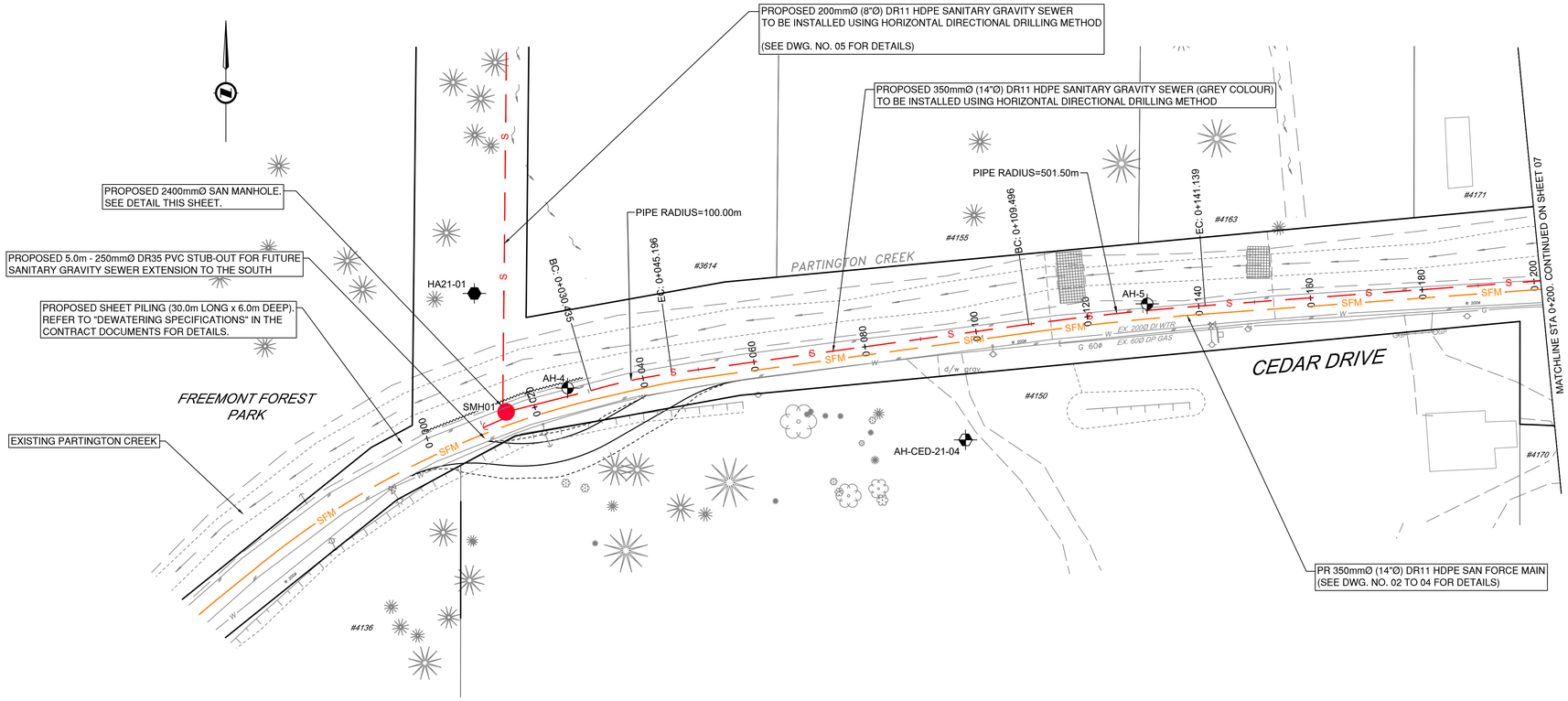
FREEMONT EAST R.O.W.
CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 05 OF 50 REV. 1

File: \\isledmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CAD\20_Drafting\203_Sheets\32628_SH_Sanitary.dwg



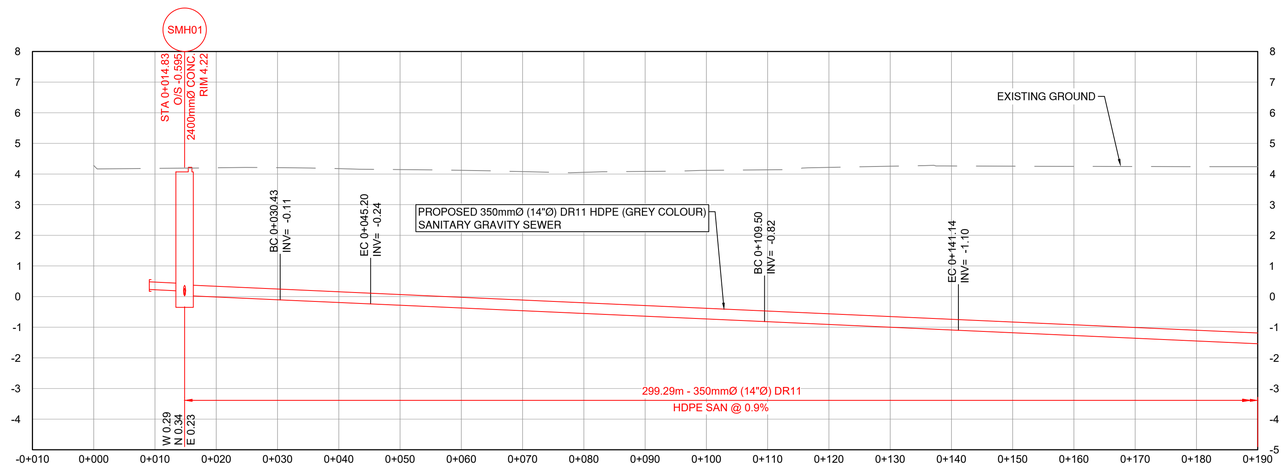
SANITARY GRAVITY SEWER - SITE PLAN
SCALE: 1:500

LEGEND:

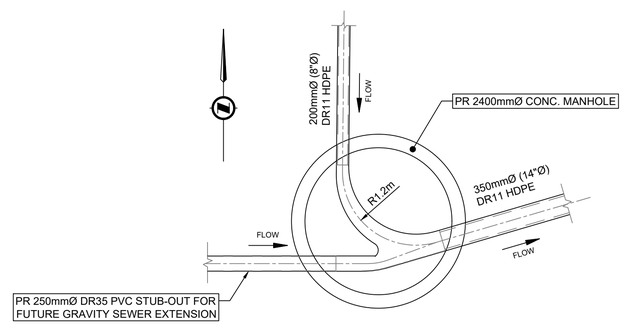
- HAND AUGERHOLE[1]
- AUGERHOLE / MONITORING WELL[1]
- AUGER DRILL HOLE[2]

NOTES:
1: SEE GEOTECHNICAL ENGINEERING ASSESSMENT LETTER REPORT (REF NO. VAN-00260722) PREPARED BY EXP SERVICES INC. DATED NOVEMBER 01, 2021 FOR DETAILS.

2: SEE SUPPLEMENTAL GEOTECHNICAL REPORT (FILE: 3937) PREPARED BY GEOPACIFIC CONSULTANTS LTD. DATED MARCH 12, 2002 FOR DETAILS.



SANITARY GRAVITY SEWER - PROFILE VIEW
SCALE: 1:500H / 1:100V



SMH01 MANHOLE DETAIL
NTS

1:500 0 10 30m

RECORD DRAWINGS DESIGN NO. 32628

PLOT DATE: April 30, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	BROTHER HDD PROFILE SKETCH IN BLUE	2023/02/01	GA	KPT
2	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY SEWER

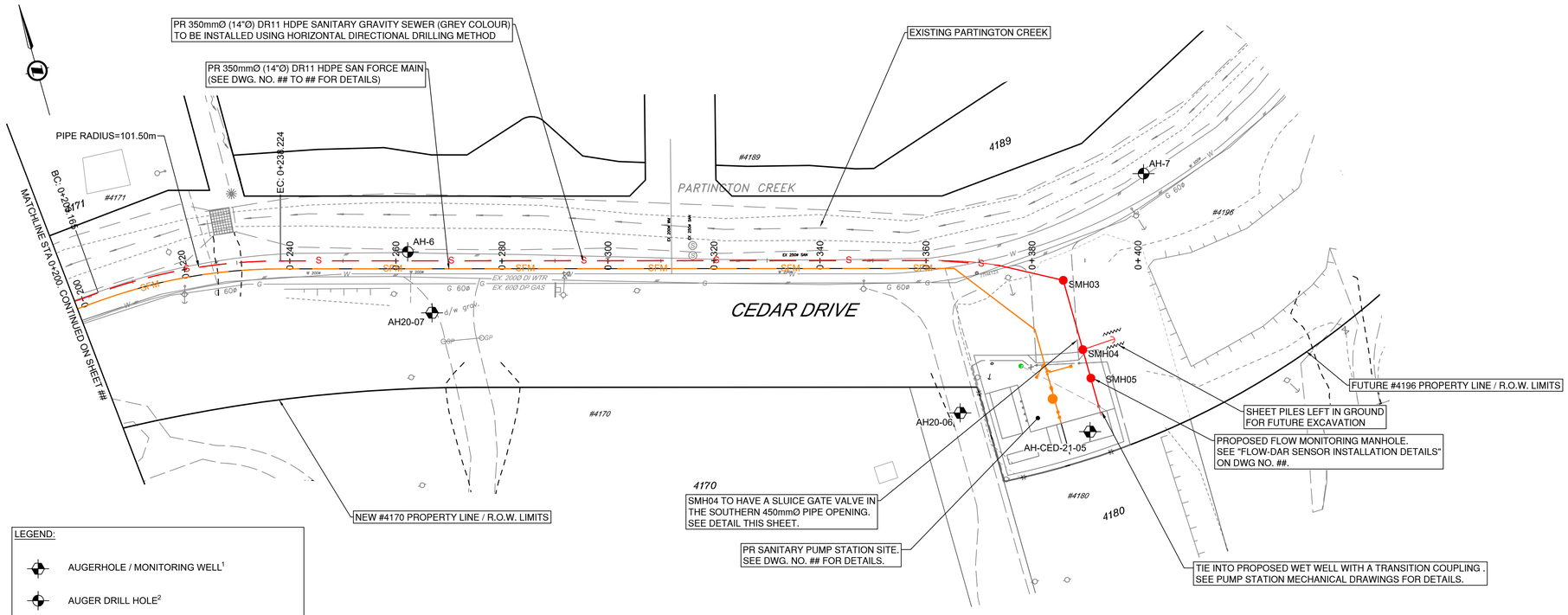
STA 0+000 TO 0+200
CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 06 OF 50
REV. 2

File: \\ateelmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CAD\20_Drafting\203_Sheets\32628_SH_Sanitary.dwg



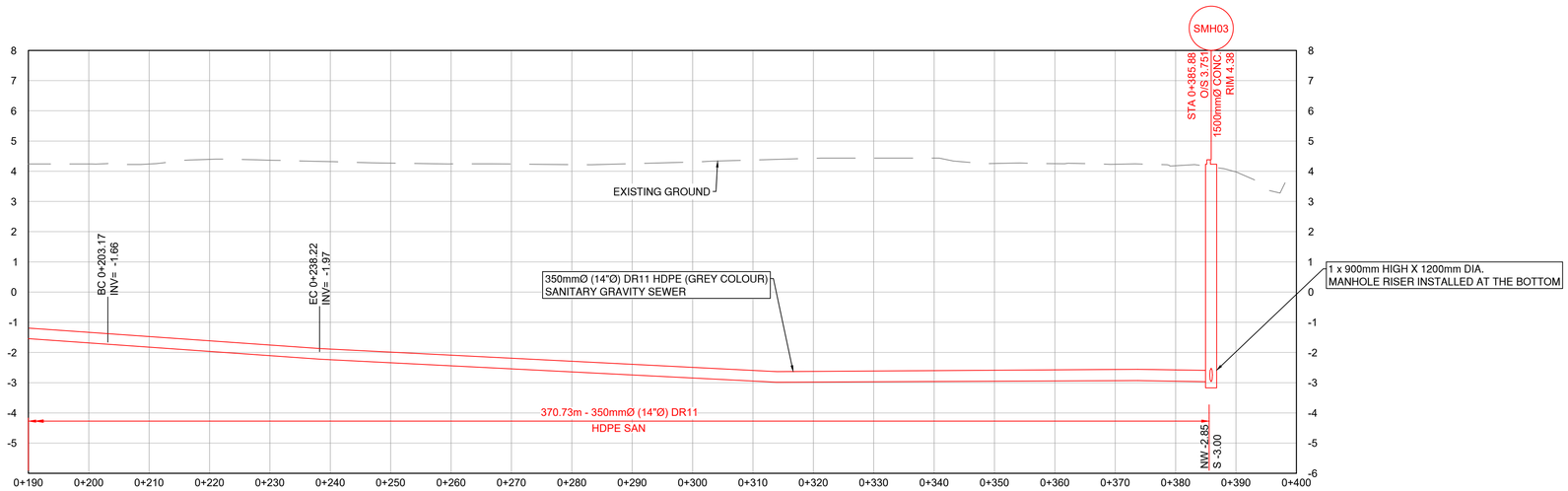
SANITARY GRAVITY SEWER - SITE PLAN
SCALE: 1:500

LEGEND:

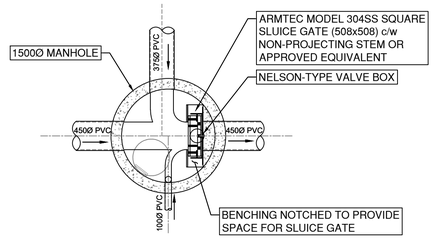
- AUGERHOLE / MONITORING WELL[1]
- AUGER DRILL HOLE[2]

NOTES:
1: SEE GEOTECHNICAL ENGINEERING ASSESSMENT LETTER REPORTS (REF NO. VAN-00260722) PREPARED BY EXP SERVICES INC. DATED JANURARY 22, 2021 AND NOVEMBER 01, 2021 FOR DETAILS.

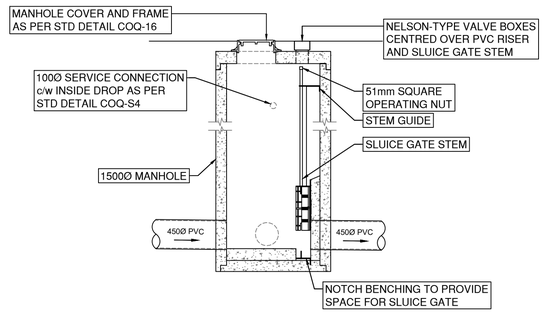
2: SEE SUPPLEMENTAL GEOTECHNICAL REPORT (FILE: 3937) PREPARED BY GEOPACIFIC CONSULTANTS LTD. DATED MARCH 12, 2002 FOR DETAILS.



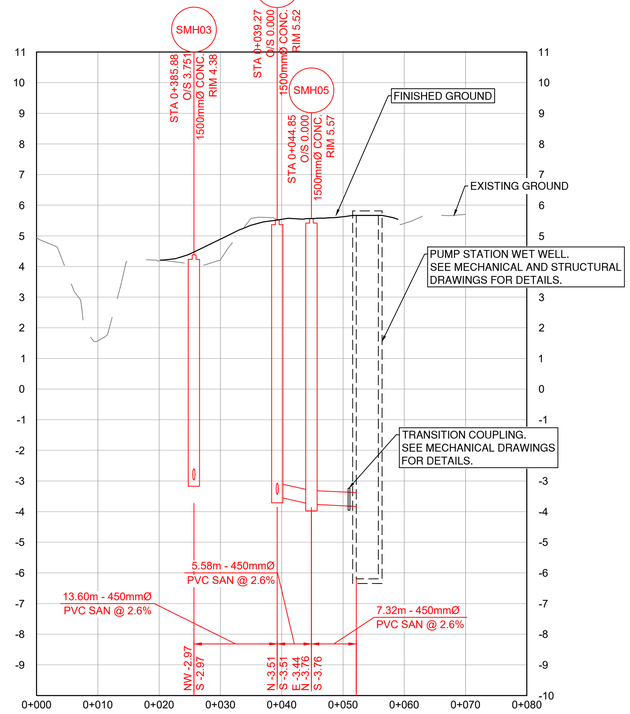
SANITARY GRAVITY SEWER - PROFILE VIEW
SCALE: 1:500H / 1:100V



SMH04 SLUICE GATE DETAIL
PLAN VIEW
SCALE: NTS



SMH04 SLUICE GATE DETAIL
SECTION VIEW
SCALE: NTS



PUMP STATION CONNECTION - PROFILE VIEW
SCALE: 1:500H / 1:100V

1:500 0 10 30m

RECORD DRAWINGS DESIGN NO. 32628

PLOT DATE: May 2, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	BROTHER HDD PROFILE SKETCH IN BLUE	2023/02/01	GA	KPT
2	REVISED PUMP STATION CONNECTION PROFILE VIEW	2023/03/20	GA	KPT
3	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY SEWER

STA 0+200 TO 0+400

CEDAR DRIVE UPGRADES - PHASE 01

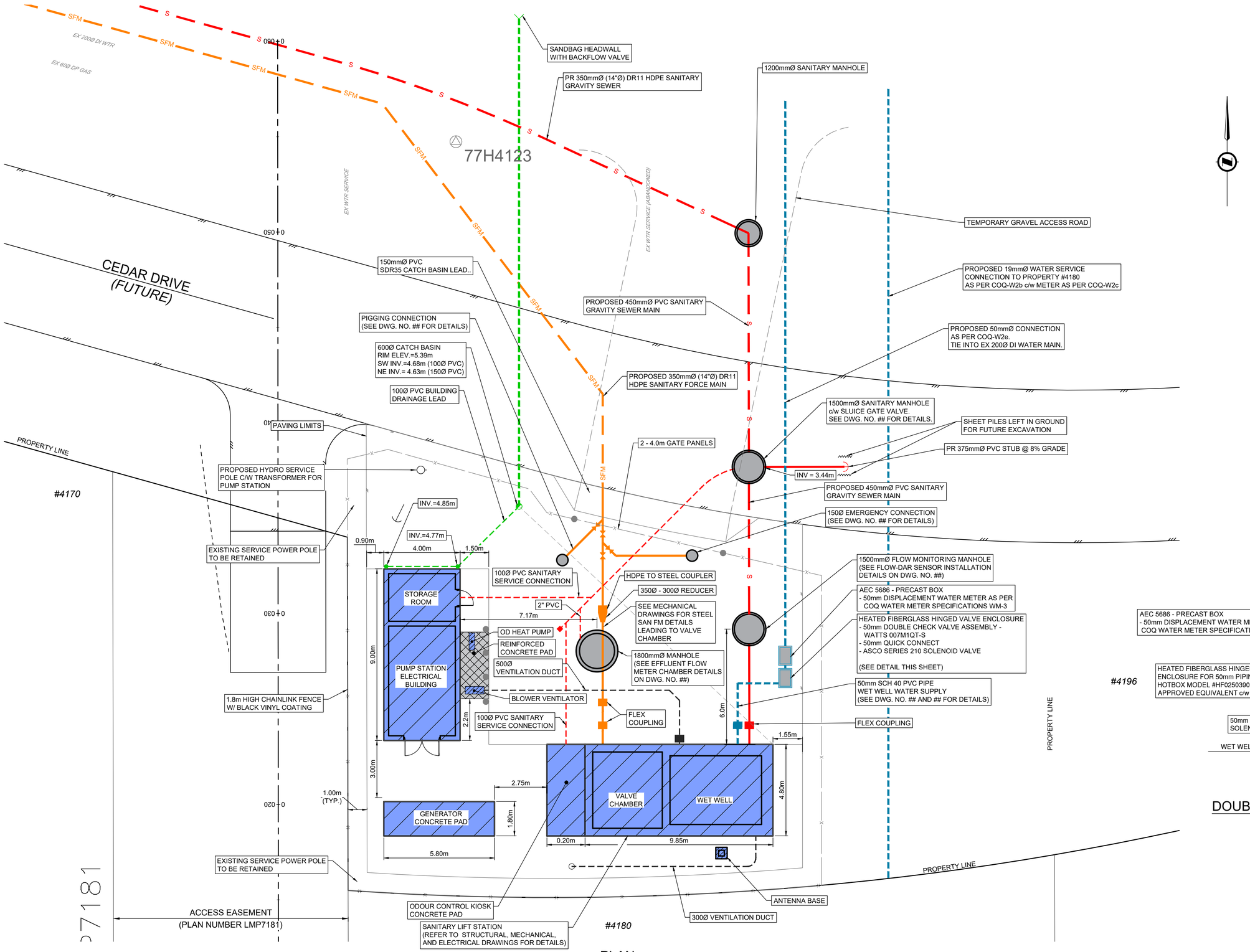
ISL
#201, Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

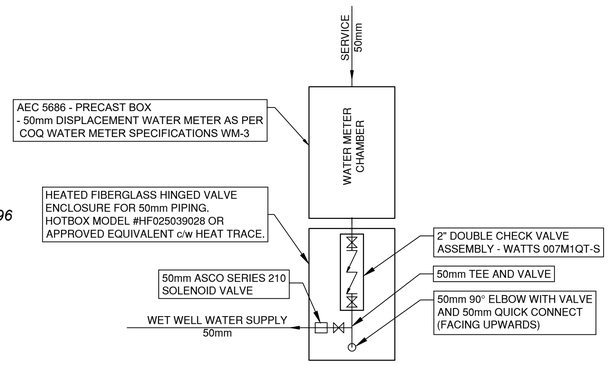
SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 07 OF 50

REV. 3

File: \\isledmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_Sanitary.dwg





WATER METER AND DOUBLE CHECK VALVE ASSEMBLY DETAIL

NTS

PLAN

SCALE 1:100

0 2 6m
1:100

PRELIMINARY DESIGN

DESIGN NO. 32628

PLOT DATE: May 31, 2024

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	RFI 09	2022/11/02	GA	KPT
2	UPDATED HYDRO SERVICE POLE LOCATION	2023/03/20	GA	KPT
3	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

SANITARY SEWER

PUMP STATION SITE PLAN

CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, 3999 Henning Dr, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

DWG. NO. 08 OF 50
REV. 3

File: \\sledmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_Sanitary_Pump_Station_Site_Plan.dwg

EXISTING CEDAR DRIVE

PROPOSED SANITARY MANHOLE
RIM = 4.39m
(FUTURE RIM = 5.02m)
(SEE DWG. NO. 09 FOR DETAILS)

PROPOSED SANITARY MANHOLE
RIM = 5.44m
(SEE DWG. NO. 09 FOR DETAILS)

PROPOSED ELECTRICAL BUILDING
SLAB ELEVATION = 5.67m
(SEE STRUCTURAL AND ARCHITECTURAL DWGS)

PROPOSED GENERATOR
CONCRETE PAD

PROPOSED PUMP STATION WET WELL AND VALVE CHAMBER.
TOP ELEVATION= 5.82m.
(SEE MECHANICAL AND STRUCTURAL DWGS FOR DETAILS)

0+780

0+800

0+820

#4170

#4180

#4196

SURFACE TREATMENT

ASPHALT DRIVEWAY:
- 75mm HOT MIX ASPHALT (UPPER COURSE #1)
- 275mm OF 19mm MINUS GRANULAR BASE

TEMPORARY GRAVEL DRIVEWAY
- 250mm OF 19mm MINUS GRANULAR BASE

CONCRETE
- 100mm OF CONCRETE (200mm FOR DRIVEWAY APRON)
- 250mm OF 19mm MINUS GRANULAR BASE

100mm TOPSOIL AND HYDROSEED

BUILDING / STRUCTURAL CONCRETE

LEGEND:
- 5.53 PROPOSED ELEVATION
- 5.55 EXISTING ELEVATION

1:250 0 5 15m

PLAN
SCALE 1:100

PLOT DATE: April 30, 2024

RECORD DRAWINGS DESIGN NO. 32628

REV NO	REVISIONS	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2022/07/15	GA	KPT
1	REVISED GRADING	2023/08/10	GA	CJB
2	RECORD DRAWINGS	2024/05/31	GA	CJB

Coquitlam

PUMP STATION GRADING PLAN
CEDAR DRIVE UPGRADES - PHASE 01

ISL
#201, Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	FEB - 2022
DRAWN BY	GA	DESIGN BY	CJB/KPT
CHECKED BY	CJB	APPROVED BY	KPT

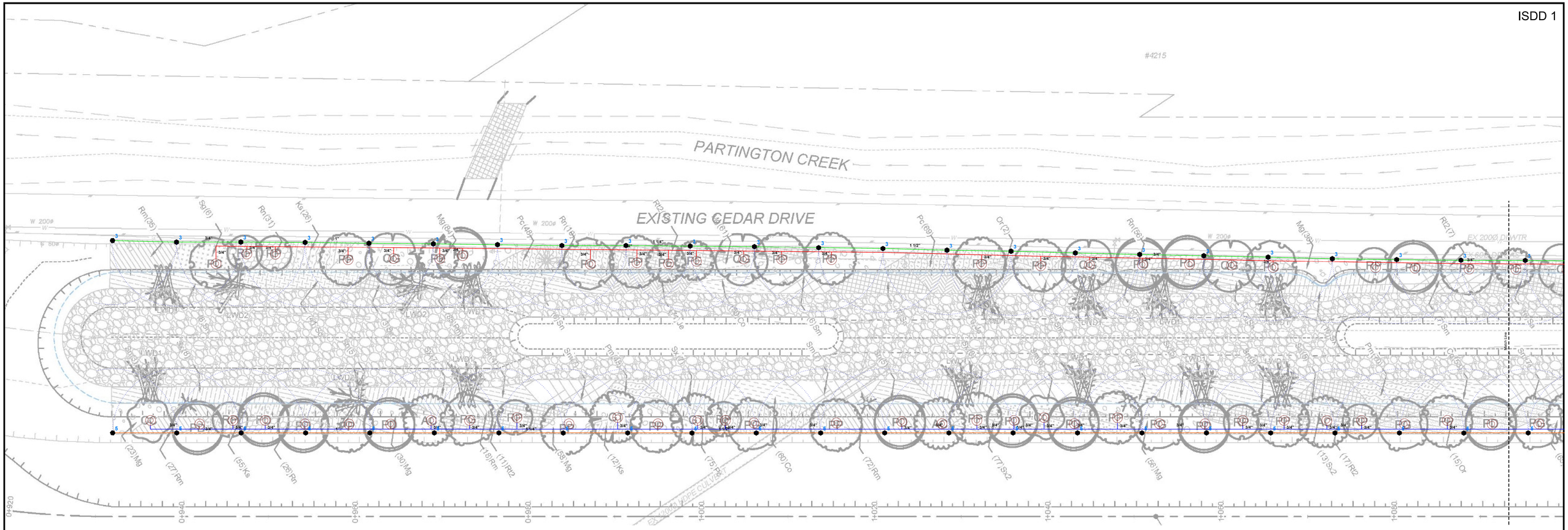
DWG. NO. 09 OF 50
REV. 2

File: \\sletedmonton.local\Global\Projects\32000\32600\32628_COQ_Cedar_Drive_Upgrades\02_CADD\20_Drafting\203_Sheets\32628_SH_PS_Grading_Plan.dwg

Appendix J -

Phase 1 (2024 Construction)

Irrigation System Design Drawings



Irrigation

Symbol	Description	Pressure	Flow	Radius
Sprinklers				
●	Rain Bird 5000 Series 1.5 LA - 5004-PC-SAM-R	45 psi	1.58 gpm	31 ft
Meters/Pumps				
POC1	2" Point of Connection - water supply			
Backflow Assemblies				
BF	Watts 007M1QT - 2"			
Control Valves				
⊕	Rain Bird 150-PEB			
200	Rain Bird 200-PEB			
✪	Rain Bird XCZ-100-PRB-COM			
◈	Rain Bird XCZ-150-PRB-COM			
Irrigation Accessories				
⧓	R&W 1" isolation valve			
⧓	R&W 2" isolation valve			
⚠	Toro SB-12-PS1-U			
FS	Toro TFS-200 Flow Sensor			
Lateral Line Pipe				
———	Class 200 3/4" - colour coded by zone			
———	Class 200 1" - colour coded by zone			
———	Class 200 1 1/4" - colour coded by zone			
———	Class 200 1 1/2" - colour coded by zone			
———	Class 200 2" - colour coded by zone			
———	Class 200 2 1/2" - colour coded by zone			
Mainline Pipe				
- - - - - - -	Class 200 2"			
- - - - - - -	Class 200 2 1/2"			
Drip Tubing				
———	Rain Bird XFS-09-12			

Install according to City of Coquitlam Irrigation Specifications & Details

REV NO:	DESCRIPTION	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	2024/02/26	K Ell	CJB
B	DETAILED DESIGN	2024/04/01	K Ell	CJB
C	ISSUED FOR TENDER	2024/04/10	K Ell	CJB
D	ADDENDUM #2	2024/05/02	K Ell	CJB

Coquitlam

CITY OF COQUITLAM
CEDAR DRIVE UPGRADES

IRRIGATION PLAN

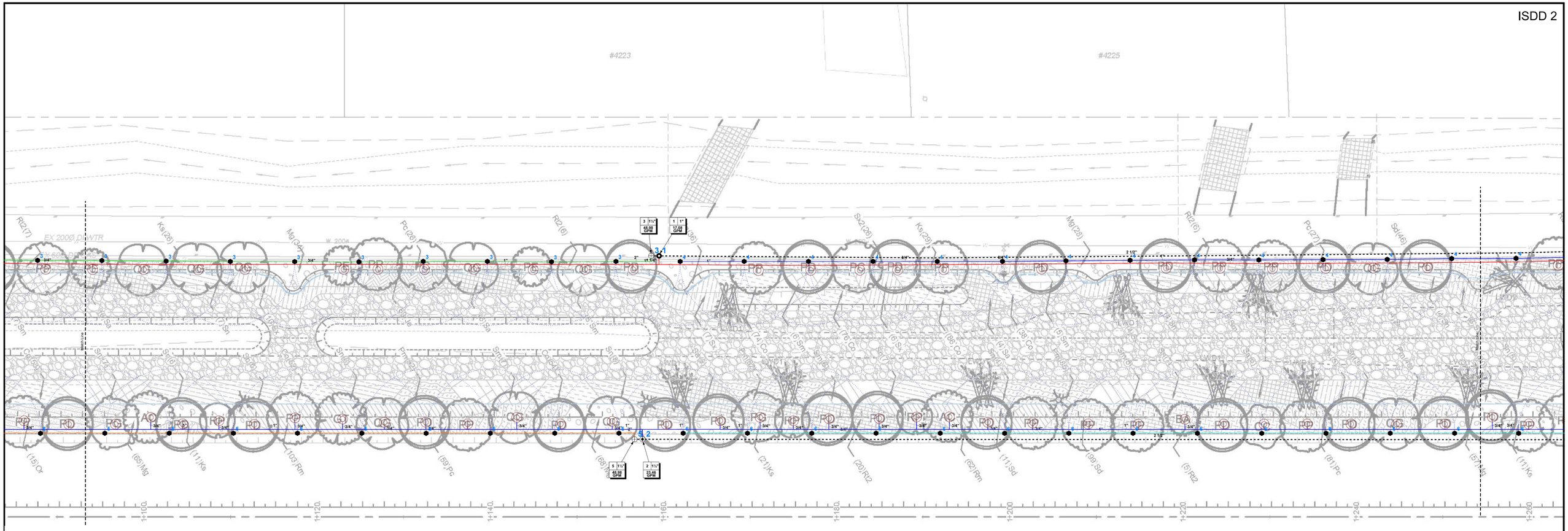
KORE
#110, 19140 28th Ave, Surrey, BC V3Z 6M3
T: (604) 536-2025 www.kore.ca

ISL
#201, 3999 Henning Drive, Burnaby, BC V5C 6P9
T: (604) 629-2696 F: (604) 629-2698

SCALE:	1 : 200	CREATION DATE:	Feb 12, 2024
DRAWN BY:	K Ell		
CHECKED BY:	K Ell		
DESIGN NO.:	33527		

DWG NO 13 of 16

REV D



Irrigation

Symbol	Description	Pressure	Flow	Radius
Sprinklers				
⬢	Rain Bird 5000 Series 1.5 LA - 5004-PC-SAM-R	45 psi	1.58 gpm	31 ft
Meters/Pumps				
POC1	2" Point of Connection - water supply			
Backflow Assemblies				
WC	Watts 007M1QT - 2"			
Control Valves				
	Rain Bird 150-PEB			
WV	Rain Bird 200-PEB			
	Rain Bird XCZ-100-PRB-COM			
	Rain Bird XCZ-150-PRB-COM			
Irrigation Accessories				
	R&W 1" isolation valve			
	R&W 2" isolation valve			
⚠	Toro SB-12-PS1-U			
FS	Toro TFS-200 Flow Sensor			
Lateral Line Pipe				
———	Class 200 3/4" - colour coded by zone			
———	Class 200 1" - colour coded by zone			
———	Class 200 1 1/4" - colour coded by zone			
———	Class 200 1 1/2" - colour coded by zone			
———	Class 200 2" - colour coded by zone			
———	Class 200 2 1/2" - colour coded by zone			
Mainline Pipe				
- - - - - - -	Class 200 2"			
- - - - - - -	Class 200 2 1/2"			
Drip Tubing				
———	Rain Bird XFS-09-12			

Install according to City of Coquitlam Irrigation Specifications & Details

REV NO:	DESCRIPTION	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	2024/02/26	K Ell	CJB
B	DETAILED DESIGN	2024/04/01	K Ell	CJB
C	ISSUED FOR TENDER	2024/04/10	K Ell	CJB
D	ADDENDUM #2	2024/05/02	K Ell	CJB

Coquitlam

CITY OF COQUITLAM
CEDAR DRIVE UPGRADES

IRRIGATION PLAN

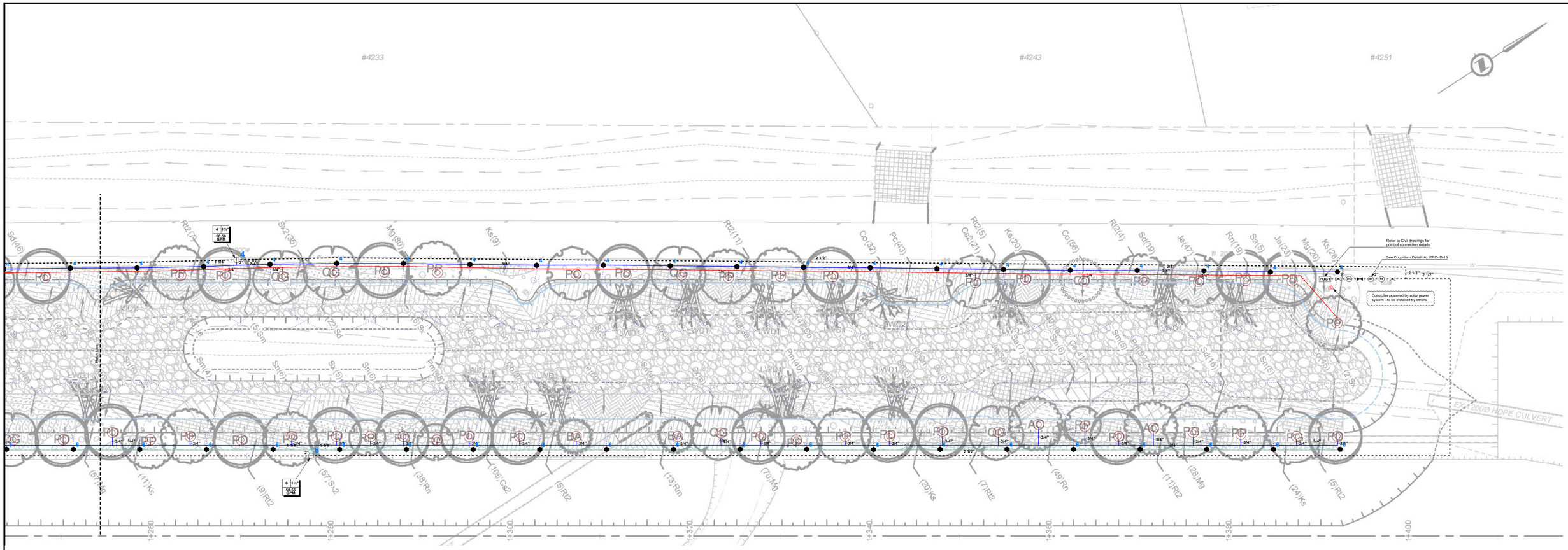
KORE
#110, 19140 28th Ave, Surrey, BC V3Z 6M3
T: (604) 536-2025 www.kore.ca

ISL
#201, 3999 Henning Drive, Burnaby, BC V5C 6P9
T: (604) 629-2696 F: (604) 629-2698

SCALE:	1 : 200	CREATION DATE:	Feb 12, 2024
DRAWN BY:	K Ell		
CHECKED BY:	K Ell		
DESIGN NO.:	33527		

DWG NO 14 of 16

REV D



Irrigation

Symbol	Description	Pressure	Flow	Radius
Sprinklers				
●	Rain Bird 5000 Series 1.5 LA - 5004-PC-SAM-R	45 psi	1.58 gpm	31 ft
Meters/Pumps				
POC1	2" Point of Connection - water supply			
Backflow Assemblies				
BC	Watts 007M1QT - 2"			
Control Valves				
	Rain Bird 150-PEB			
MV	Rain Bird 200-PEB			
	Rain Bird XCZ-100-PRB-COM			
	Rain Bird XCZ-150-PRB-COM			
Irrigation Accessories				
	R&W 1" isolation valve			
	R&W 2" isolation valve			
	Toro SB-12-PS1-U			
FS	Toro TFS-200 Flow Sensor			
Lateral Line Pipe				
———	Class 200 3/4" - colour coded by zone			
———	Class 200 1" - colour coded by zone			
———	Class 200 1 1/4" - colour coded by zone			
———	Class 200 1 1/2" - colour coded by zone			
———	Class 200 2" - colour coded by zone			
———	Class 200 2 1/2" - colour coded by zone			
Mainline Pipe				
- - - - - - -	Class 200 2"			
- - - - - - -	Class 200 2 1/2"			
Drip Tubing				
———	Rain Bird XFS-09-12			

Install according to City of Coquitlam Irrigation Specifications & Details

REV NO:	DESCRIPTION	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	2024/02/26	K Ell	CJB
B	DETAILED DESIGN	2024/04/01	K Ell	CJB
C	ISSUED FOR TENDER	2024/04/10	K Ell	CJB
D	ADDENDUM #2	2024/05/02	K Ell	CJB

Coquitlam

CITY OF COQUITLAM
CEDAR DRIVE UPGRADES

IRRIGATION PLAN

KORE
#110, 19140 28th Ave, Surrey, BC V3Z 6M3
T: (604) 536-2025 www.kore.ca

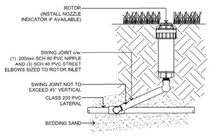
ISL
#201, 3999 Henning Drive, Burnaby, BC V5C 6P9
T: (604) 629-2696 F: (604) 629-2698

SCALE:	1 : 200	CREATION DATE:	Feb 12, 2024
DRAWN BY:	K Ell		
CHECKED BY:	K Ell		
DESIGN NO.:	33527		

DWG NO 15 of 16

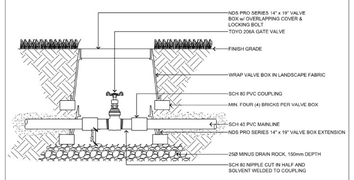
REV D

Coquitlam | PARK DEVELOPMENT STANDARDS



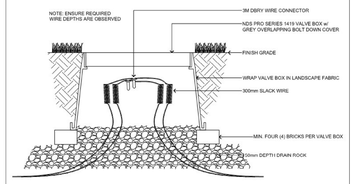
SCALE N.T.S. | ROTOR
REV 30/11/2018 | DETAIL NO: PRC-ID-03

Coquitlam | PARK DEVELOPMENT STANDARDS



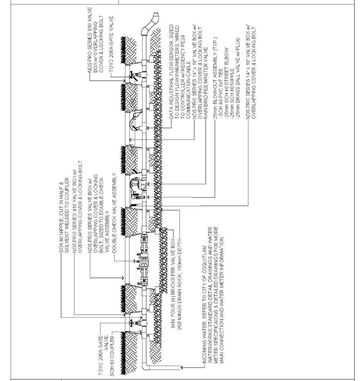
SCALE N.T.S. | GATE VALVE
REV 30/11/2018 | DETAIL NO: PRC-ID-07

Coquitlam | PARK DEVELOPMENT STANDARDS



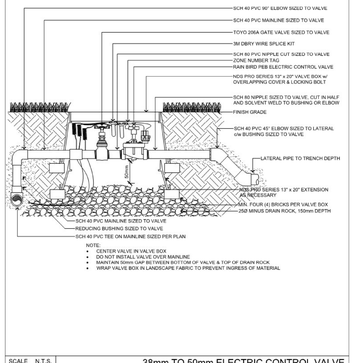
SCALE N.T.S. | WIRE SPLICE BOX
REV 30/11/2018 | DETAIL NO: PRC-ID-08

Coquitlam | PARK DEVELOPMENT STANDARDS



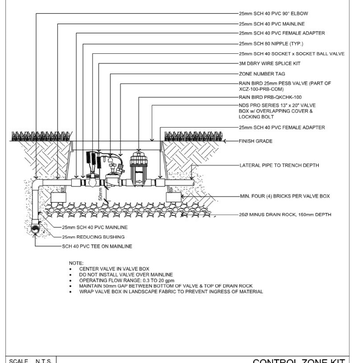
SCALE N.T.S. | 25mm TO 50mm POINT OF CONNECTION
REV 30/11/2018 | DETAIL NO: PRC-ID-18

Coquitlam | PARK DEVELOPMENT STANDARDS



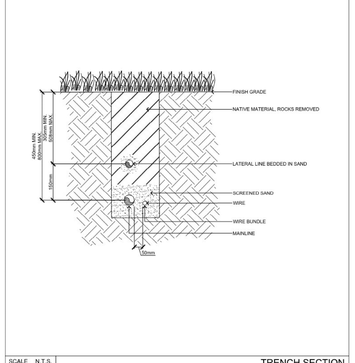
SCALE N.T.S. | 38mm TO 50mm ELECTRIC CONTROL VALVE
REV 30/11/2018 | DETAIL NO: PRC-ID-10

Coquitlam | PARK DEVELOPMENT STANDARDS



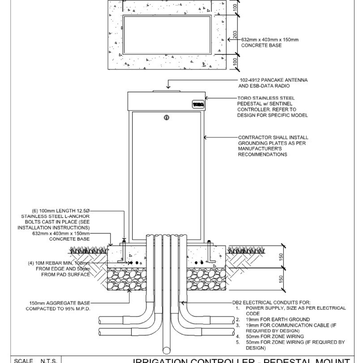
SCALE N.T.S. | CONTROL ZONE KIT
REV 30/11/2018 | DETAIL NO: PRC-ID-11

Coquitlam | PARK DEVELOPMENT STANDARDS



SCALE N.T.S. | TRENCH SECTION
REV 30/11/2018 | DETAIL NO: PRC-ID-12

Coquitlam | PARK DEVELOPMENT STANDARDS



SCALE N.T.S. | IRRIGATION CONTROLLER - PEDESTAL MOUNT
REV 30/11/2018 | DETAIL NO: PRC-ID-15

REV NO:	DESCRIPTION	DATE	DRAWN	APPR'D
A	ADDENDUM #2	2024/05/02	K Ell	CJB

Coquitlam

CITY OF COQUITLAM
CEDAR DRIVE UPGRADES

IRRIGATION DETAILS

KORE
#110, 19140 28th Ave, Surrey, BC V3Z 6M3
T: (604) 536-2025 www.kore.ca

ISL
#201, 3999 Henning Drive, Burnaby, BC V5C 6P9
T: (604) 629-2696 F: (604) 629-2698

SCALE:	1 : 200	CREATION DATE:	Feb 12, 2024
DRAWN BY:	K Ell		
CHECKED BY:	K Ell		
DESIGN NO.:	33527		

DWG NO 16 of 16

REV A

Appendix K -

IFC Drawings for Phase 1 Works (2024 Construction)

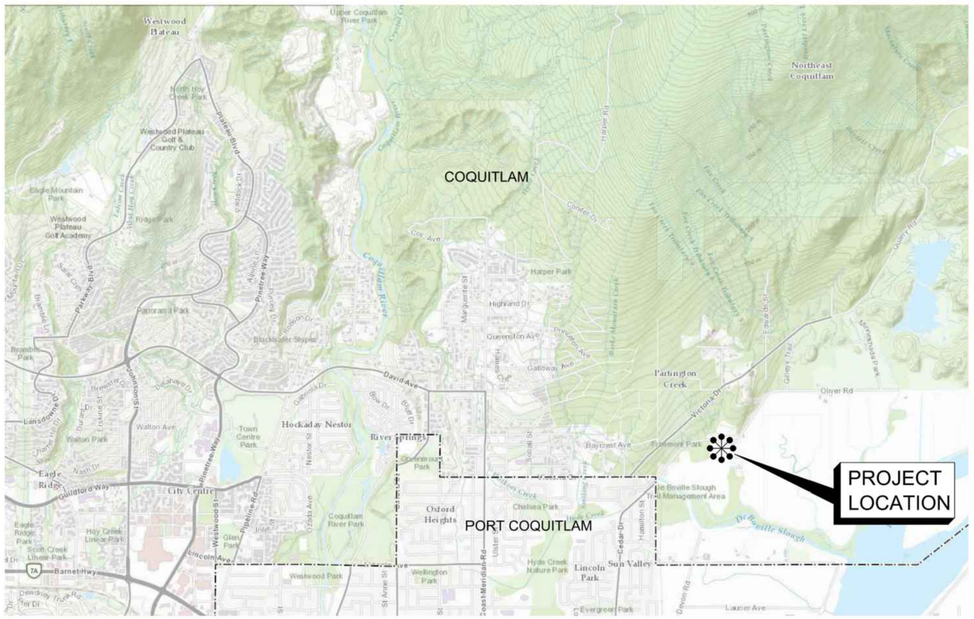
	DRAWING SCHEDULE		
CATEGORY	DWG. NO.	SHEET TITLE	REV. NO.
GENERAL	00	COVER	
	01	GENERAL NOTES	0
	02	KEY PLAN	0
	03	TYPICAL SECTIONS	0
DRAINAGE CHANNEL	04	DRAINAGE CHANNEL	0
	05	DRAINAGE CHANNEL	0
ENVIRONMENTAL PLANTING	06	ENVIRONMENTAL PLANTING 1	0
	07	ENVIRONMENTAL PLANTING 2	0
	08	ENVIRONMENTAL PLANTING 3	0
	09	ENVIRONMENTAL PLANTING 4	0
	10	ENVIRONMENTAL PLANTING DETAILS	0
ESC	11	ESC NOTES AND DETAILS	0
	12	ESC PLAN	0
IRRIGATION	13	IRRIGATION PLAN 1	0
	14	IRRIGATION PLAN 2	0
	15	IRRIGATION PLAN 3	0
	16	IRRIGATION DETAILS	0

Coquitlam

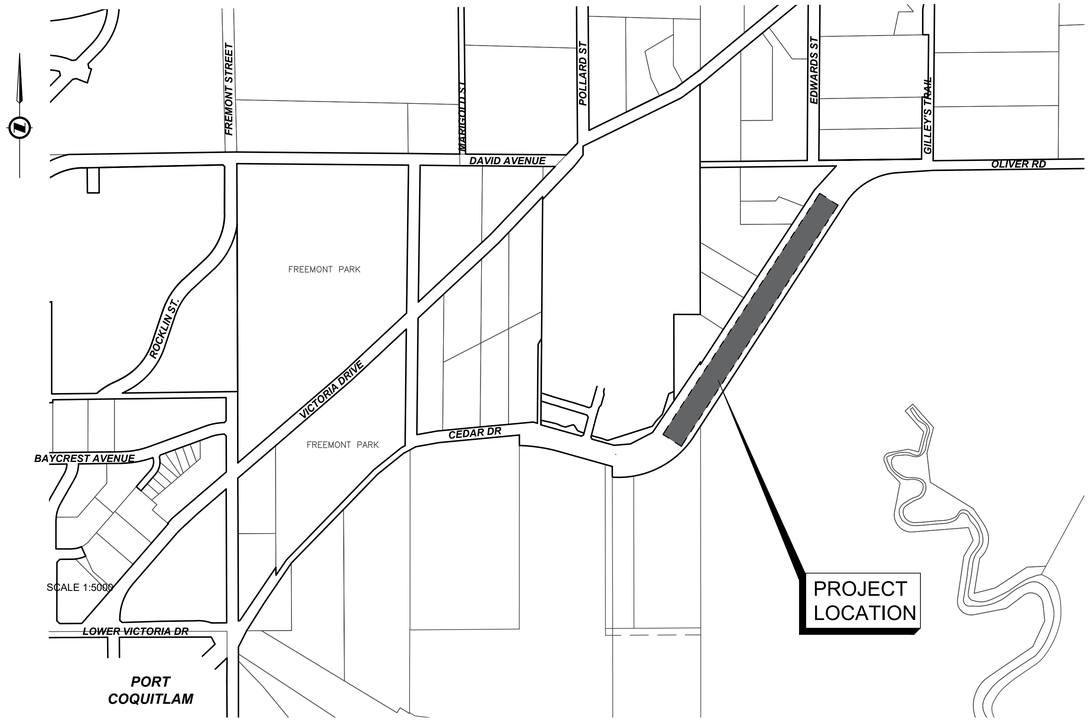
CONTRACT No.: 81832 - PHASE 1

CEDAR DRIVE UPGRADES - PHASE 1
2024 CONSTRUCTION WORKS
ISSUED FOR CONSTRUCTION

Permit to Practice
ISL Engineering and Land Services Ltd.
RR Signature:
RR EGBC ID: 129518
Date: 2024-06-27
Permit Number 1000419
Engineers & Geoscientists British Columbia



LOCATION PLAN
NTS



LOCATION PLAN

ISL Engineering and Land Services
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

GENERAL NOTES:

1. ELEVATIONS ARE RELATIVE TO CVD28GVRD. HORIZONTAL COORDINATES ARE IN LOCAL PROJECT GROUND COORDINATES. REFER TO SURVEY CONTROL TABLE ON THIS SHEET.
2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE PLATINUM EDITION (2009) OF THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) AND MMCD SUPPLEMENTARY UPDATES TO DATE AND CITY OF COQUITLAM SUPPLEMENTARY SPECIFICATIONS AND DETAIL DRAWINGS UNLESS OTHERWISE NOTED.
3. RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION SHALL BE GIVEN AT LEAST 5 DAYS NOTICE PRIOR TO THE START OF CONSTRUCTION. IF CONSTRUCTION ENTERS ONTO PRIVATE PROPERTY, THE CONTRACTOR WILL REQUIRE WRITTEN AUTHORIZATION FROM THE PROPERTY OWNER PRIOR TO UNDERTAKING ANY WORK.
4. THE LOCATION OF EXISTING UTILITIES IS COMPILED FROM OWNER AND UTILITY SUPPLIED RECORD DRAWINGS AND ARE CONSIDERED APPROXIMATE ONLY. THE EXACT LOCATION AND EXTENT OF UTILITIES SHOULD BE DETERMINED BY CONSULTING THE LOCAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND INVERT ELEVATION BY HAND OR HYDROVAC EXCAVATION BEFORE CONSTRUCTION OF UTILITY CROSSINGS AND SHALL BE RESPONSIBLE FOR RESTORATION OF ANY DAMAGE TO EXISTING UTILITIES. ANY COSTS ASSOCIATED WITH UTILITY CONFLICTS THAT WERE NOT PRELOCATED WILL BE THE CONTRACTORS RESPONSIBILITY.
5. THE CONTRACTOR IS TO NOTIFY THE CITY OF COQUITLAM 48 HOURS IN ADVANCE OF ANY CONSTRUCTION OR UTILITY RELOCATION/CONFLICTS.
6. REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR A MIN 72 HOURS PRIOR TO CONSTRUCTION.
7. ALL SURVEY MONUMENTS WITHIN THE PROJECT BOUNDARIES SHALL BE PROTECTED DURING THE COURSE OF THE WORK. SHOULD ANY SURVEY MONUMENT REQUIRE RAISING OR RELOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEERING AND OPERATIONS DEPARTMENT AT LEAST 72 HOURS IN ADVANCE OF SCHEDULING WORK. ALL DISTURBED MONUMENTS WILL BE REPLACED BY A B.C. LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
8. SURVEY PINS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE REPLACED BY A B.C. LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
9. ALL PUBLIC ROADWAYS AFFECTED BY THE WORKS SHALL BE KEPT IN A CLEAN STATE AT ALL TIMES. DUST CONTROL MEASURES SHALL ALSO BE EMPLOYED DURING THE COURSE OF THE WORK.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, AND FOR COORDINATING THE VARIOUS PARTS OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THERE IS NO DISRUPTION TO SERVICE, AND IF DISRUPTION IS ANTICIPATED, TO NOTIFY THE CONTRACT ADMINISTRATOR A MINIMUM OF 72 HOURS PRIOR, AND OBTAIN APPROVAL FOR THE DISRUPTION.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL EXCAVATED MATERIAL UNSUITABLE FOR REUSE AT A SUITABLE OFF-SITE DISPOSAL AREA, IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
12. THE CONTRACTOR SHALL PROVIDE TEMPORARY UTILITY POLE SUPPORTS NECESSARY TO COMPLETE THE WORKS AS AN INCIDENTAL ITEM TO GENERAL CONTRACT REQUIREMENTS WHERE AND AS REQUIRED.
13. CONTRACTOR TO MAINTAIN AN UP TO DATE SET OF AS-CONSTRUCTED DRAWINGS AT ALL TIMES. AS-CONSTRUCTED DRAWINGS TO BE DELIVERED TO THE CONTRACT ADMINISTRATOR AT SUBSTANTIAL PERFORMANCE FOR PREPARATION OF FINAL RECORD DRAWINGS. THE CONTRACT ADMINISTRATOR SHALL BE PROVIDED ACCESS TO REVIEW THE AS-CONSTRUCTED DRAWINGS AT ALL TIMES TO CONFIRM THEY ARE UP TO DATE.
14. THE CONTRACTOR SHALL MAINTAIN AND MONITOR THE PROVISIONS FOR EROSION CONTROL AND SEDIMENT AS PER THE CITY BYLAW 4403, 2013 AND AS PER THE CONTRACT DOCUMENTS.

TRAFFIC MANAGEMENT, NOTIFICATION AND APPROVALS NOTES:

1. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SIGNAGE, BARRIERS, FLASHING INDICATORS, ETC. AT ALL TIMES TO ENSURE THE SAFETY OF THE PUBLIC. THE CONTRACTOR SHALL COMPLY WITH ALL TRAFFIC REQUIREMENTS AS SPECIFIED WITHIN THE CONTRACT DOCUMENTS. NO ROAD SHALL BE CLOSED WITHOUT THE WRITTEN CONSENT OF THE DIRECTOR OF ENGINEERING AND OPERATIONS.
2. THE CONTRACTOR SHALL ENSURE THAT ALL APPROVALS REQUIRED FOR THE PROPOSED WORKS HAVE BEEN OBTAINED FROM ALL AUTHORITIES AND AGENCIES PRIOR TO COMMENCING THE WORK.
3. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE PERSONNEL AT LEAST 72 HOURS PRIOR TO THE WORK. SCHEDULING AND OTHER CONSTRUCTION CONSTRAINTS IMPOSED BY THESE WORKS SHALL BE TAKEN INTO ACCOUNT.
4. A TRAFFIC AND PEDESTRIAN SAFETY CONTROL PLAN SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO THE PRE-CONSTRUCTION MEETING.
5. APPROVALS FOR REQUIRED TREE CUTTING OR TRIMMING NOT INDICATED IN CONTRACT DRAWINGS SHALL BE OBTAINED BY THE CONTRACTOR FROM THE CITY PRIOR TO WORK BEING PERFORMED.
6. CONTRACTOR TO OBTAIN APPROVED LANE CLOSURE REQUEST FORM FOR ALL WORKS. APPROVED REQUESTS ARE CIRCULATED TO ALL EMERGENCY SERVICES.
7. CONTRACTOR TO SUBMIT A TRAFFIC MANAGEMENT PLAN WITH LANE CLOSURE REQUEST FOR ALL MAJOR ROADS AND ANY LOCAL ROADS WHICH REQUIRE ANY DETOURS.
8. ALL TRAFFIC CONTROL TO CONFORM TO THE LATEST EDITION OF THE BC TRAFFIC CONTROL MANUAL FOR WORK ON ROADWAYS.
9. APPROVAL OF NOISE VARIANCE FOR ALL WORK OUTSIDE OF NORMAL APPROVED WORK HOURS REQUIRED BY THE CITY.
10. NOTICE OF CONSTRUCTION SIGNS TO BE INSTALLED AT ALL PROJECT LIMITS AND PREFERRED DETOUR ROUTE. NOTIFY CONTRACT ADMINISTRATOR WITH CONSTRUCTION SCHEDULE AND LOCATIONS. SIGNS PROVIDED AND INSTALLED BY THE CONTRACTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETION OF ALL TAPED TEMPORARY AND PERMANENT PAINT AND THERMOPLASTIC PAVEMENT MARKINGS IN THE PLACE OF THE WORK. PERMANENT LANE MARKINGS ARE TO BE PLACED WITHIN SEVENTY-TWO (72) HOURS OF FINAL PAVING AND PERMANENT THERMOPLASTIC PAVEMENT MARKINGS ARE TO BE PLACED WITHIN FIVE (5) DAYS OF FINAL PAVING. ALL TEMPORARY MARKINGS TO BE REMOVED IMMEDIATELY FOLLOWING PLACEMENT OF PERMANENT PAVEMENT MARKINGS.
12. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE TRAFFIC MANAGEMENT DETAILED SPECIFICATIONS IN THE CONTRACT DOCUMENTS.

STORM AND SANITARY SEWER NOTES:

1. NO CHANGES TO BE MADE TO PIPES, MANHOLES, OR ALIGNMENT WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR.
2. THE CONTRACTOR IS TO EXPOSE EXISTING WATERMAINS, STORM AND SANITARY SEWERS AT TIE-IN LOCATION AND ALL EXISTING UTILITIES BETWEEN. UTILITY DEPTHS AND LOCATIONS ARE TO BE RECORDED AND FORWARDED TO THE CONTRACT ADMINISTRATOR FOR REVIEW.
3. ASSURANCE OF PROTECTION OF THE WATERMAIN AS PER FRASER HEALTH AUTHORITY, JULY 14, 2006:
   PARALLEL LINES: WATERMAINS SHOULD BE LAID AT LEAST 3m HORIZONTALLY FROM ANY SANITARY OR STORM SEWER. WHERE THIS HORIZONTAL SEPARATION IS NOT POSSIBLE, THE BOTTOM OF THE WATERMAIN SHOULD BE AT LEAST 45cm ABOVE THE TOP OF THE SEWER AND SUFFICIENTLY TO ONE SIDE OF THE SEWER TO ALL FOR SEWER REPAIRS WITHOUT DISTURBING THE WATERMAIN. IF THIS VERTICAL SEPARATION IS NOT POSSIBLE, THE SEWER SHOULD BE OF THE SAME SERVICE CAPABILITY AS THE WATERMAIN, WITH PRESSURE CLASS JOINTS DESIGNED TO REMAIN WATERTIGHT IF THE GROUNDWATER TABLE PERIODICALLY RISES ABOVE THE SEWER, AND ARE PRESSURE TESTED BEFORE BACKFILLING. OTHER PRECAUTIONS, SUCH AS A WATERMAIN WITH IMPROVED JOINTS AND HIGHER STRENGTH MAY BE NEEDED.
4. CROSSINGS: WHERE A WATERMAIN CROSSES A SANITARY OR STORM SEWER, THE LINES SHOULD BE LAID WITH THE WATERMAIN CROSSING OVER THE SEWER AND WITH THE MIDDLE OF PIPE LENGTHS LOCATED AT THE CROSSING POINT, TO MAXIMIZE THE SEPARATION BETWEEN JOINTS. WHERE A MINIMUM 3m JOINT SEPARATION AND/OR A MINIMUM 45cm CLEAR VERTICAL SEPARATION IS NOT POSSIBLE AT THE CROSSING, PRECAUTIONS TO IMPROVE WATER TIGHTNESS OF THE SEWER JOINTS AND STRUCTURAL IMPROVEMENTS SUCH AS HIGHER STRENGTH WATERMAIN AND/OR SEWER AT THE CROSSING AREA MAY BE NEEDED. SLEEVING, PIPE BRIDGING OR OTHER SUITABLE MEASURES MAY BE CONSIDERED. ALL JOINTS WITHIN 3m OF THE CROSSING SHOULD BE:
   - WRAPPED WITH HEAT SHRINK PLASTIC OR
   - PACKED WITH INERT PETROLATUM COMPOUND AND WRAPPED IN TAPE IN ACCORDANCE WITH ANSI/AWWA STANDARDS C209 AND C217-90.

   FOR SERVICE CONNECTIONS, WHEREVER POSSIBLE, THE ABOVE CONSTRUCTION PRACTICES SHOULD ALSO BE APPLIED.
5. FIGURED DIMENSION SHALL GOVERN OVER SCALED DIMENSIONS.
6. REFER TO COQ STD. DWG. COQ-G4 FOR UTILITY TRENCH DETAIL.
7. STORM SEWER MATERIALS ARE TO CONFORM TO THE MMCD SPECIFICATIONS.
8. ALL PIPE SIZES INDICATED REFER TO MINIMUM INSIDE DIAMETER DIMENSIONS.
9. ALL CATCH BASINS SHALL BE AS PER COQ STD. DWG. COQ-S11A.
10. CATCH BASIN AND LAWN DRAIN LEADS TO BE 150mm DIAMETER PVC 28 PIPE FOR SINGLE CATCH BASINS AND LAWN DRAINS THAT TIE INTO THE MAIN DIRECTLY. LEADS ARE TO BE 200mm DIAMETER PVC 35 PIPE FROM THE STORM MAIN TO THE WYE FOR CATCH BASIN/LAWN DRAIN COMBINATIONS AS PER THE CONNECTION DETAIL ON SHEET 4.

WATERMAIN NOTES:

4. ALL NEW 300mm WATERMAINS SHALL BE CLASS 50 DUCTILE IRON AND INSTALLED WITH 1.0m MINIMUM COVER UNLESS OTHERWISE NOTED. ALL NEW 400mm WATERMAINS SHALL BE PRESSURE CLASS 350 DUCTILE IRON AND INSTALLED WITH 1.2m MINIMUM COVER UNLESS OTHERWISE NOTED.
5. NO CHANGES TO BE MADE TO PIPE, FITTINGS, OR ALIGNMENT WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR
6. ALL TIE-INS TO EXISTING WATERMAINS AND WATER SERVICE TRANSFERS WILL BE PERFORMED BY THE CONTRACTOR.
7. THE CONTRACTOR IS TO EXPOSE EXISTING WATERMAINS AND WATER SERVICES AT TIE-IN LOCATION AND ALL EXISTING UTILITIES BETWEEN. UTILITY DEPTHS ARE TO BE RECORDED AND FORWARDED TO THE CONTRACT ADMINISTRATOR FOR REVIEW.
8. ASSURANCE OF PROTECTION OF THE WATERMAIN AS PER FRASER HEALTH AUTHORITY, JULY 14, 2006
9. PARALLEL LINES: WATERMAINS SHOULD BE LAID AT LEAST 3m HORIZONTALLY FROM ANY SANITARY OR STORM SEWER. WHERE THIS HORIZONTAL SEPARATION IS NOT POSSIBLE, THE BOTTOM OF THE WATERMAIN SHOULD BE AT LEAST 45cm ABOVE THE TOP OF THE SEWER AND SUFFICIENTLY TO ONE SIDE OF THE SEWER TO ALLOW FOR SEWER REPAIRS WITHOUT DISTURBING THE WATERMAIN. IF THIS VERTICAL SEPARATION IS NOT POSSIBLE, THE SEWER SHOULD BE OF THE SAME SERVICE CAPABILITY AS THE WATERMAIN, WITH PRESSURE CLASS JOINTS DESIGNED TO REMAIN WATERTIGHT IF THE GROUNDWATER TABLE PERIODICALLY RISES ABOVE THE SEWER, AND ARE PRESSURE TESTED BEFORE BACKFILLING. OTHER PRECAUTIONS, SUCH AS A WATERMAIN WITH IMPROVED JOINTS AND HIGHER STRENGTH MAY BE NEEDED.
10. CROSSINGS: WHERE A WATERMAIN CROSSES A SANITARY OR STORM SEWER, THE LINES SHOULD BE LAID WITH THE WATERMAIN CROSSING OVER THE SEWER AND WITH THE MIDDLE OF PIPE LENGTHS LOCATED AT THE CROSSING POINT, TO MAXIMIZE THE SEPARATION BETWEEN JOINTS. WHERE A MINIMUM 3m JOINT SEPARATION AND/OR A MINIMUM 45cm CLEAR VERTICAL SEPARATION IS NOT POSSIBLE AT THE CROSSING, PRECAUTIONS TO IMPROVE WATER TIGHTNESS OF THE SEWER JOINTS AND STRUCTURAL IMPROVEMENTS SUCH AS HIGHER STRENGTH WATERMAIN AND/OR SEWER AT THE CROSSING AREA MAY BE NEEDED. SLEEVING, PIPE BRIDGING OR OTHER SUITABLE MEASURES MAY BE CONSIDERED. ALL JOINTS WITHIN 3m OF THE CROSSING SHOULD BE:
    - WRAPPED WITH HEAT SHRINK PLASTIC OR;
    - PACKED WITH INERT PETROLATUM COMPOUND AND WRAPPED IN TAPE IN ACCORDANCE WITH ANSI/AWWA STANDARDS C209 AND C217-90.
8. THRUST BLOCKS: THRUST BLOCKS TO BE PROVIDED AT ALL FITTINGS & CHANGES IN DIRECTION AS PER MMCD DETAIL DRAWING W1. WHERE CONDITIONS DO NOT PERMIT USE OF THRUST BLOCKS, THE CONTRACTOR SHALL USE JOINT RESTRAINTS AS SPECIFIED IN THE OWNER'S SUPPLEMENTAL SPECIFICATIONS.

200 DIA. W/M THRUST BLOCK SIZING			
BENDS	MATERIAL TYPE		
	SAND	GRAVEL	GLACIAL TILL
11.25	0.14	0.11	0.06
22.5	0.28	0.22	0.12
45	0.54	0.43	0.24
TEE	1.4	1.12	0.62
ALL VALUES ARE IN m^2			

9. ALL NEW FIRE HYDRANTS TO BE AS PER CITY OF COQUITLAM STANDARDS. HYDRANT ASSEMBLIES INCLUDE THE FOLLOWING: HYDRANT BODY, LATERAL CONNECTIONS FROM MAINLINE TEE OFF WATERMAIN TO HYDRANTS, ISOLATION VALVE AT THE MAINLINE TEE WITH ADJUSTABLE VALVE BOX AND ALL OTHER INCIDENTAL WORK.
10. MAXIMUM JOINT DEFLECTION SHOULD NOT EXCEED ONE-HALF OF THE MANUFACTURER'S RECOMMENDED SPECIFICATION.
11. ALL VERTICAL BENDS TO BE MINIMUM 2-LUG AND TIE-RODDED TOGETHER AND USE FIELD LOK 350 GASKETS FOR 3 PIPE LENGTHS BACK OF VERTICAL FITTINGS.
12. FIGURED DIMENSION SHALL GOVERN OVER SCALED DIMENSIONS.
13. ALL VALVES GREATER THAN 1.5m DEEP FROM THE NUT REQUIRE AN EXTENSION
14. ALL PIPE ZONE BACKFILL TO HAVE LESS THAN 50ppm CHLORIDE IONS, AND LESS THAN 50ppm SULFATE IONS. CONTRACTOR TO PROVIDE SOURCE TESTING RESULTS PRIOR TO DELIVERY TO SITE.

LEGEND

PROPOSED LINETYPES

- WATER SERVICE
- DRAINAGE SWALE
- BARRIER
- EDGE OF GRAVEL ROAD
- BOTTOM OF BANK
- TOP OF BANK

EXISTING LINETYPES

- BOTTOM OF BANK
- TOP OF BANK
- STREAM / CREEK / DITCH
- EDGE OF PAVEMENT
- EDGE OF GRAVEL/DIRT
- WATER MAIN
- WATER SERVICE
- GAS MAIN
- OVERHEAD LINE
- RETAINING WALL
- FENCE
- SANITARY MAIN
- SANITARY FORCEMAIN
- BARRIER

PROPOSED SYMBOLS

SYMBOL	DESCRIPTION
	WATER HYDRANT
	WATER METER

EXISTING SYMBOLS

SYMBOL	DESCRIPTION
	WATER VALVE
	WATER HYDRANT
	STORM CULVERT
GP	GATE POST
MB	MAIL BOX
	SANITARY MANHOLE
	GUY WIRE
	UTILITY POLE
	STREET LIGHT POLE
	MISC SIGN
	DECIDUOUS TREE
	CONIFEROUS TREE

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

PLOT DATE: June 24, 2024

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

GENERAL NOTES

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. P. TERNESS #32205 ENGINEER 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 01 OF 16 REV. 0

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3630

VICTORIA DRIVE

3646

4251

4233

4243

EXISTING CEDAR DRIVE

CEDAR DRIVE

3640

4225

4223

4300

FUTURE CEDAR DRIVE
CENTRELINE

4215

PARTRIDGE CREEK

PROPOSED
DRAINAGE CHANNEL

4171

0+600

0+700

0+800

0+900

1+000

1+100

4170

4196

4196

4180

1:1500 0 30 90m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

KEY PLAN

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K.P. TERMES #22005 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 02 OF 16 REV. 0

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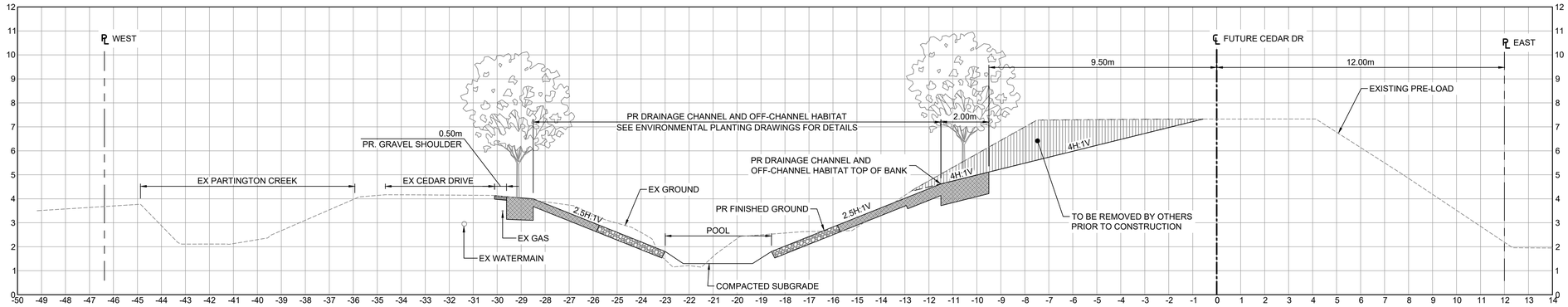
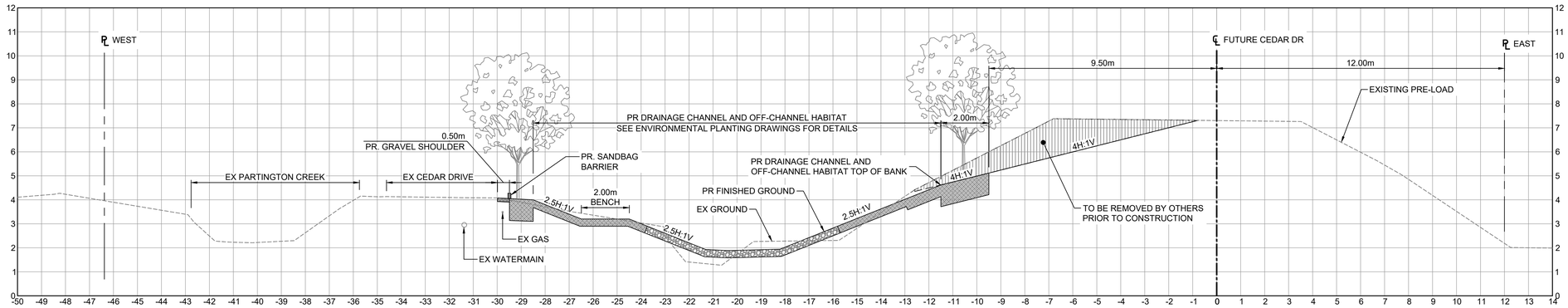


TYPICAL SECTION - STA 0+150

SCALE: 1:100



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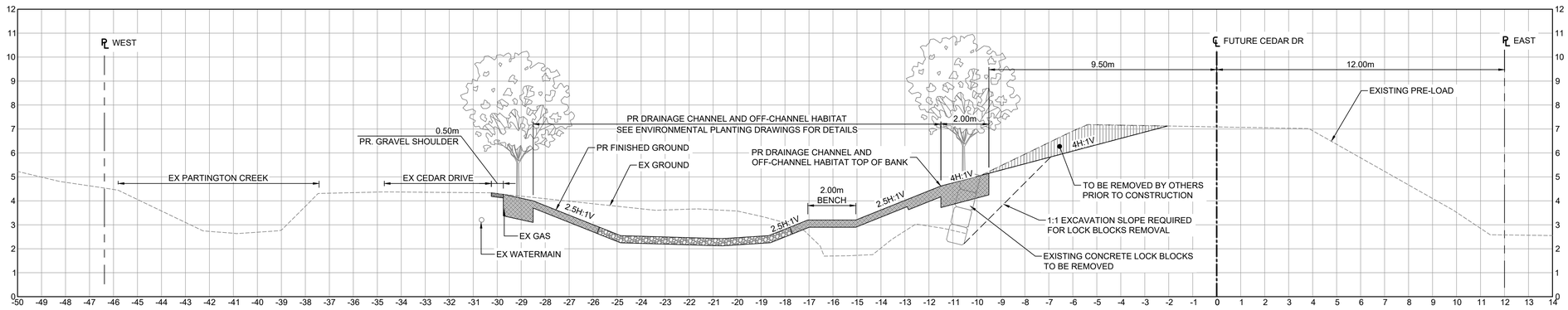

TYPICAL SECTION - STA 0+500

SCALE: 1:100

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

PLOT DATE: June 24, 2024

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

TYPICAL SECTIONS

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. P. TERNESS #32205 ENGINEER 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 03 OF 16 REV. 0

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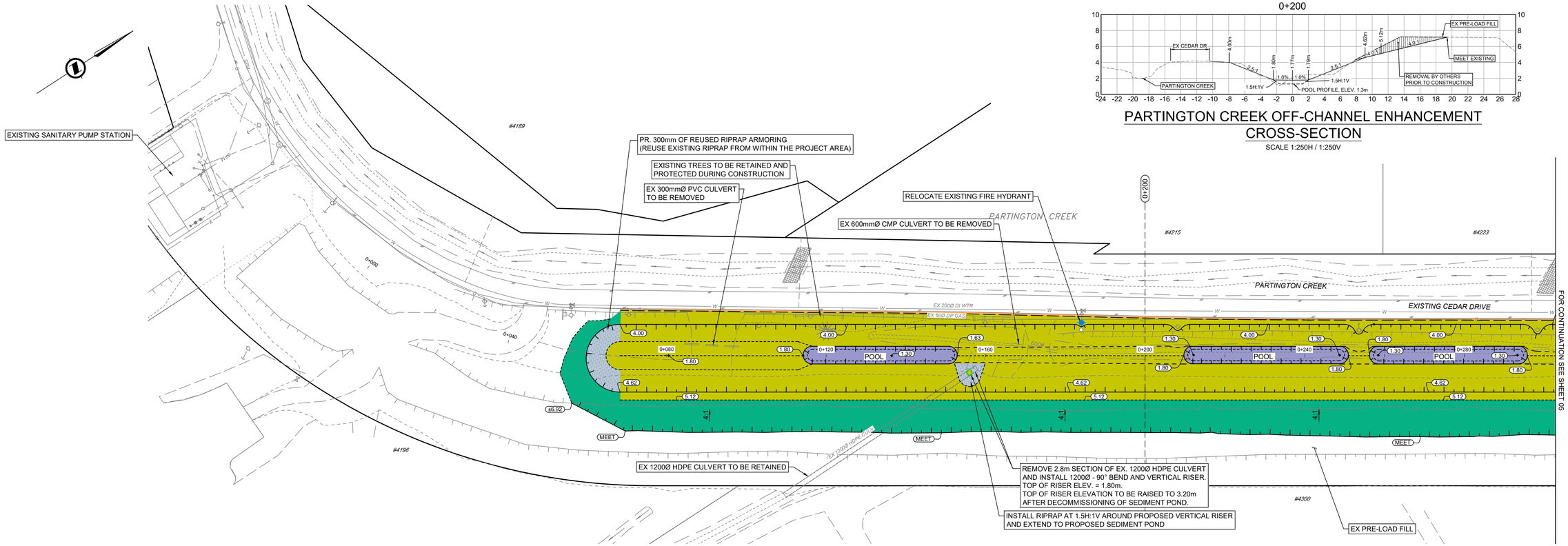


PARTINGTON CREEK OFF-CHANNEL ENHANCEMENT
CROSS-SECTION

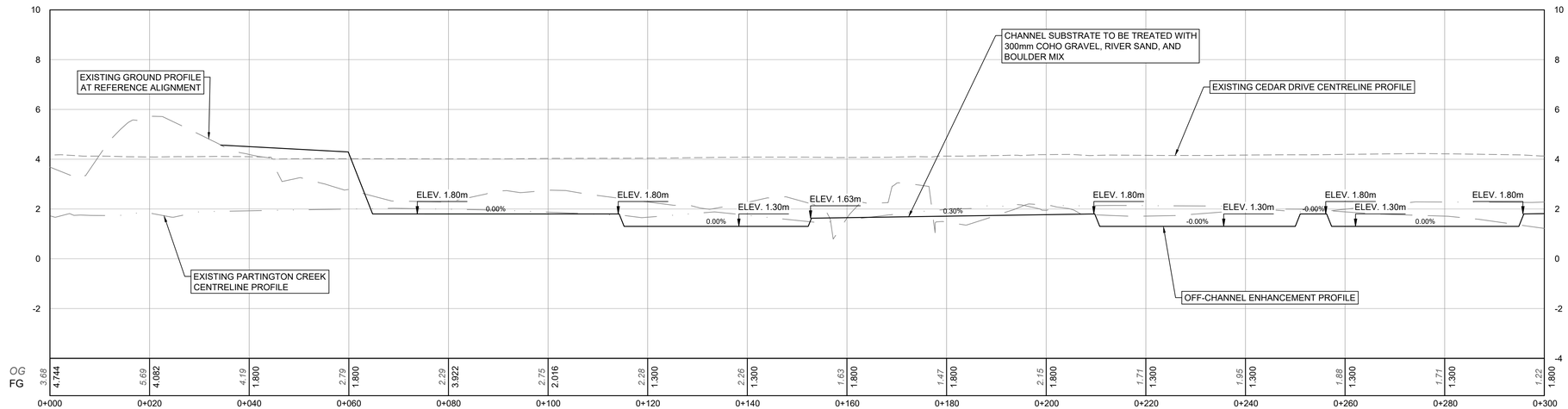
SCALE 1:250H / 1:250V

PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
PLAN VIEW

SCALE 1:500

SURFACE TREATMENT

- RIPARIAN PLANTING
  SEE ENVIRONMENTAL PLANTING DRAWINGS FOR DETAILS
- HYDROSEEDING
- COMPACTED SUBGRADE
- GRAVEL SHOULDER:
  - 150mm OF 19mm MINUS GRANULAR BASE
- 300mm OF REUSED RIPRAP ARMORING
  - REUSE EXISTING RIPRAP FROM WITHIN THE PROJECT AREA



PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
PROFILE VIEW

SCALE 1:500H / 1:100V

1:500 0 10 30m

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

PLOT DATE: June 24, 2024

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

DRAINAGE CHANNEL
CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

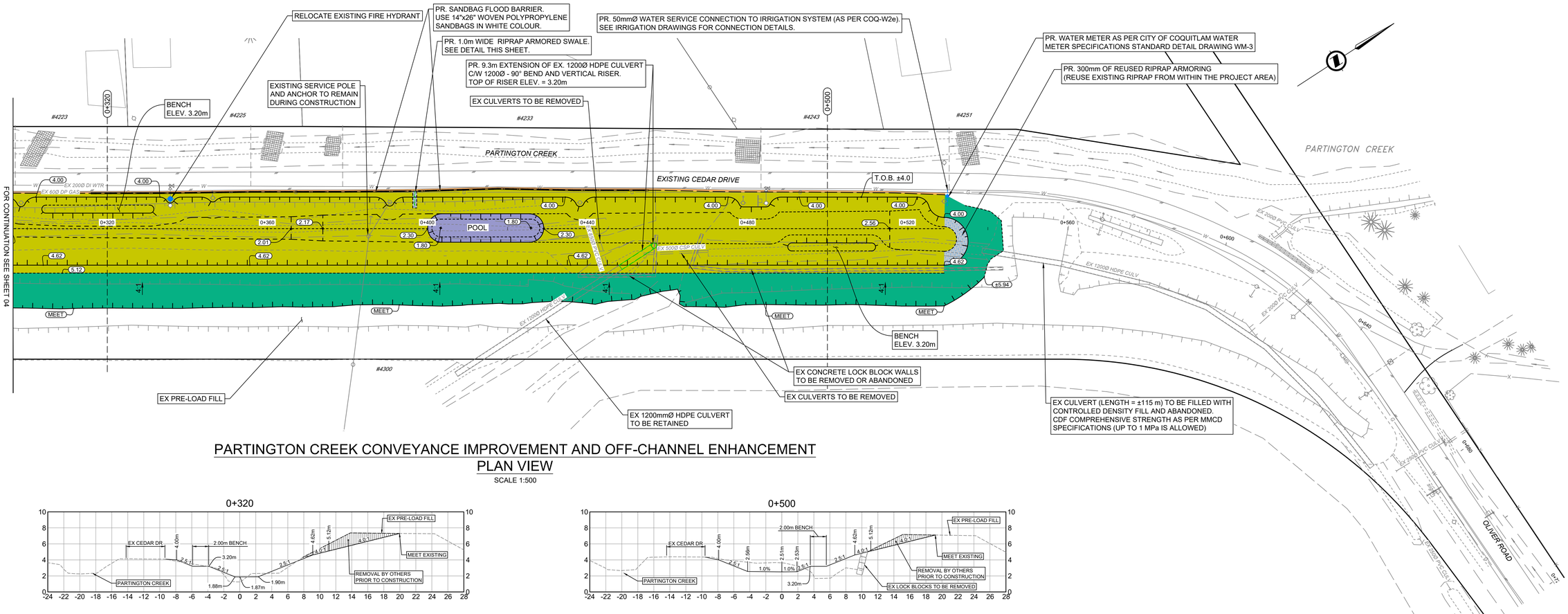
PROFESSIONAL ENGINEER K. R. TERNESS #32966 2024-06-27

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 04 OF 16 REV. 0

File: C:\Users\gatalde\DCACDDocs\ISL Engineering and Land Services Ltd-\32628_COQ_CedarDrive-Phase1Roadworks\Project Files\02_CADD\20_Drafting\203_Sheets\Phase 1 - Cedar Drive Upgrades\32628_SH_Channel_Phase_1



PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
PLAN VIEW

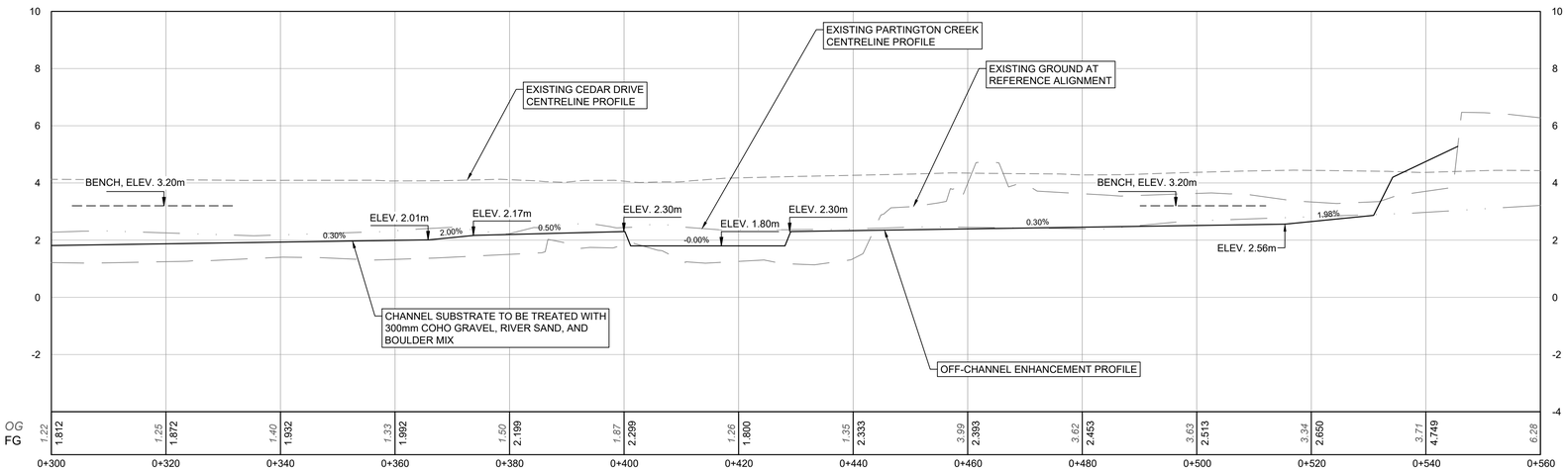
SCALE 1:500

PARTINGTON CREEK OFF-CHANNEL ENHANCEMENT
CROSS-SECTION

SCALE 1:250H / 1:250V

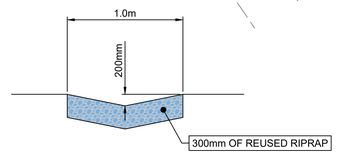
PARTINGTON CREEK OFF-CHANNEL ENHANCEMENT
CROSS-SECTION

SCALE 1:250H / 1:250V



PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
PROFILE VIEW

SCALE 1:500H / 1:100V



RIPRAP ARMORED SWALE
SECTION DETAIL

NTS

SURFACE TREATMENT

- RIPARIAN PLANTING
  SEE ENVIRONMENTAL PLANTING DRAWINGS FOR DETAILS
- HYDROSEEDING
- COMPACTED SUBGRADE
- GRAVEL SHOULDER:
  - 150mm OF 19mm MINUS GRANULAR BASE
- 300mm OF REUSED RIPRAP ARMORING
  - REUSE EXISTING RIPRAP FROM WITHIN THE PROJECT AREA

1:500 0 10 30m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

DRAINAGE CHANNEL
CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K.P. TERNESS #22205 2024-06-27

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 05 OF 16 REV. 0

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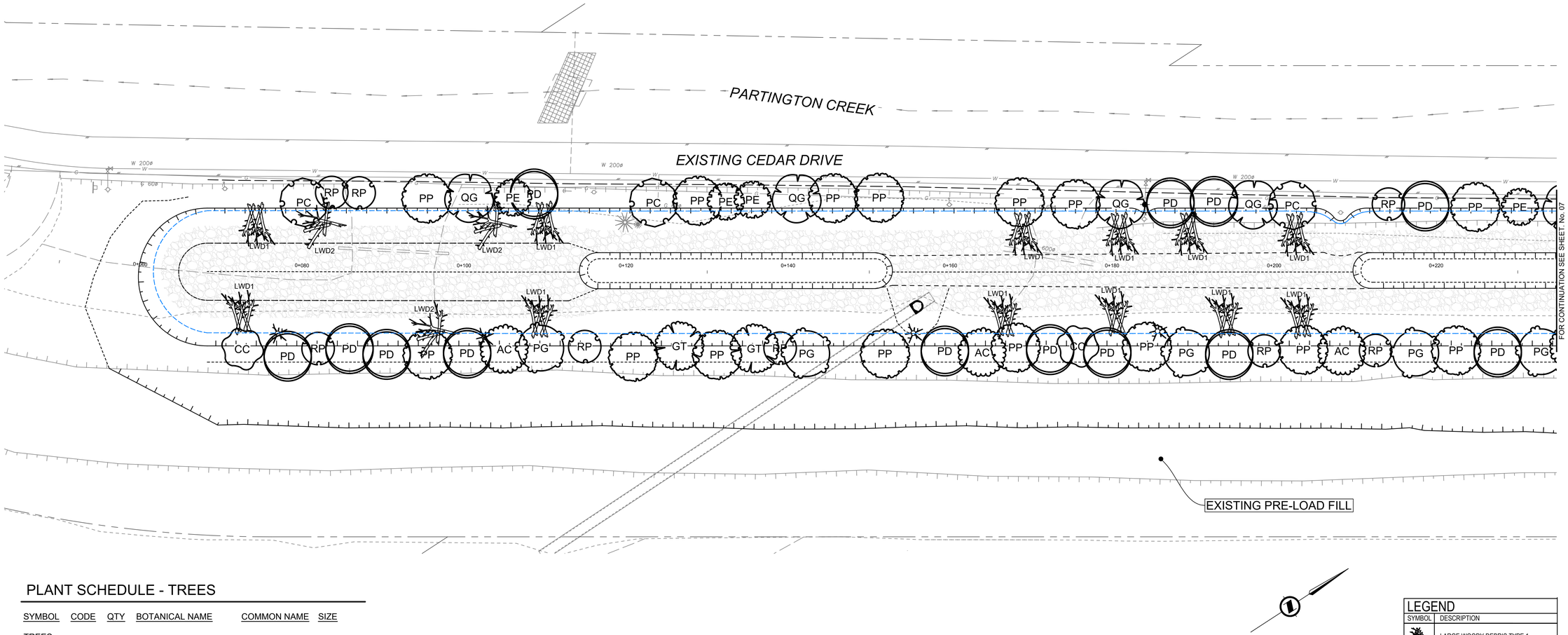

PLANT SCHEDULE - TREES

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE
TREES					
AC	AC	7	Amelanchier canadensis	Canada Serviceberry	50mm Cal.
BA	BA	3	Betula alleghaniensis	Yellow Birch	50mm Cal.
CC	CC	3	Cercis canadensis	Eastern Redbud	50mm Cal.
CD	CD	1	Crataegus douglasii suksdorfii	Black Hawthorn	50mm Cal.
GT	GT	3	Gleditsia triacanthus	Honey Locust	50mm Cal.
PG	PG	8	Picea glauca	White Spruce	2m Ht.
PC	PC	8	Pinus contorta	Shore Pine	50mm Cal.
PP	PP	38	Pinus ponderosa	Ponderosa Pine	2m Ht.
PE	PE	6	Prunus emarinata	Bitter Cherry	50mm Cal.
PD	PD	50	Pseudotsuga menziesii	Douglas Fir	2m Ht.
QG	QG	19	Quercus garryana	Garry Oak	50mm Cal.
RP	RP	14	Rhamnus purshiana	Cascara	50mm Cal.

LEGEND

SYMBOL	DESCRIPTION
	LARGE WOODY DEBRIS TYPE 1
	LARGE WOODY DEBRIS TYPE 2
	TREE SNAG
	GRAVEL AND BOULDERS
	HIGH WATER LEVEL

1:250 0 5 15m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	EZ	AR

Coquitlam

ENVIRONMENTAL PLANTING 1

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K. P. TERNESS #32295 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)529-2696 F: (604)529-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 06 OF 16 REV. 0

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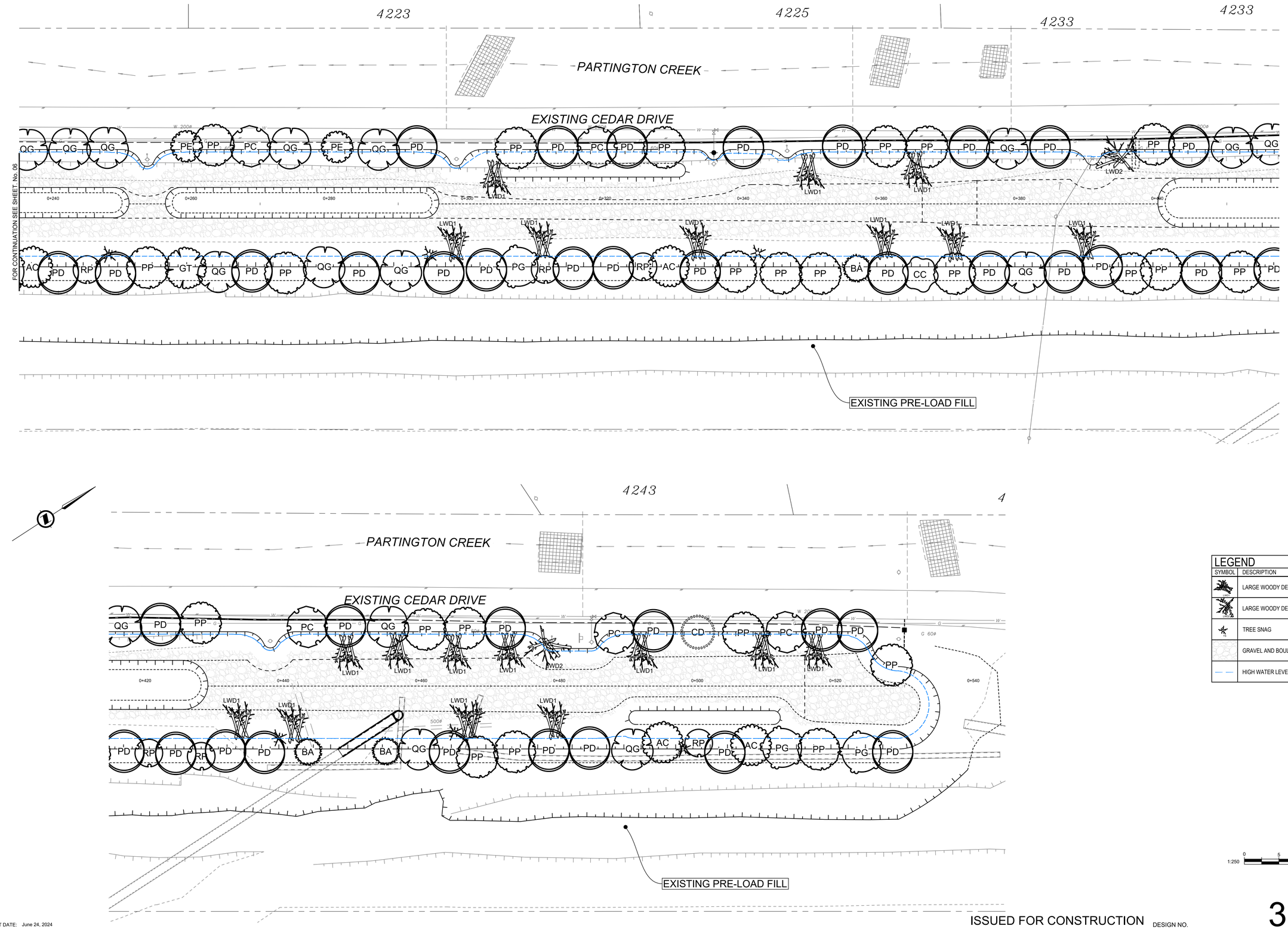

LEGEND	
SYMBOL	DESCRIPTION
	LARGE WOODY DEBRIS TYPE 1
	LARGE WOODY DEBRIS TYPE 2
	TREE SNAG
	GRAVEL AND BOULDERS
	HIGH WATER LEVEL

1:250 0 5 15m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION

DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	EZ	AR

Coquitlam

ENVIRONMENTAL PLANTING 2

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K.R.TERNESS #32205 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 07 OF 16 REV. 0

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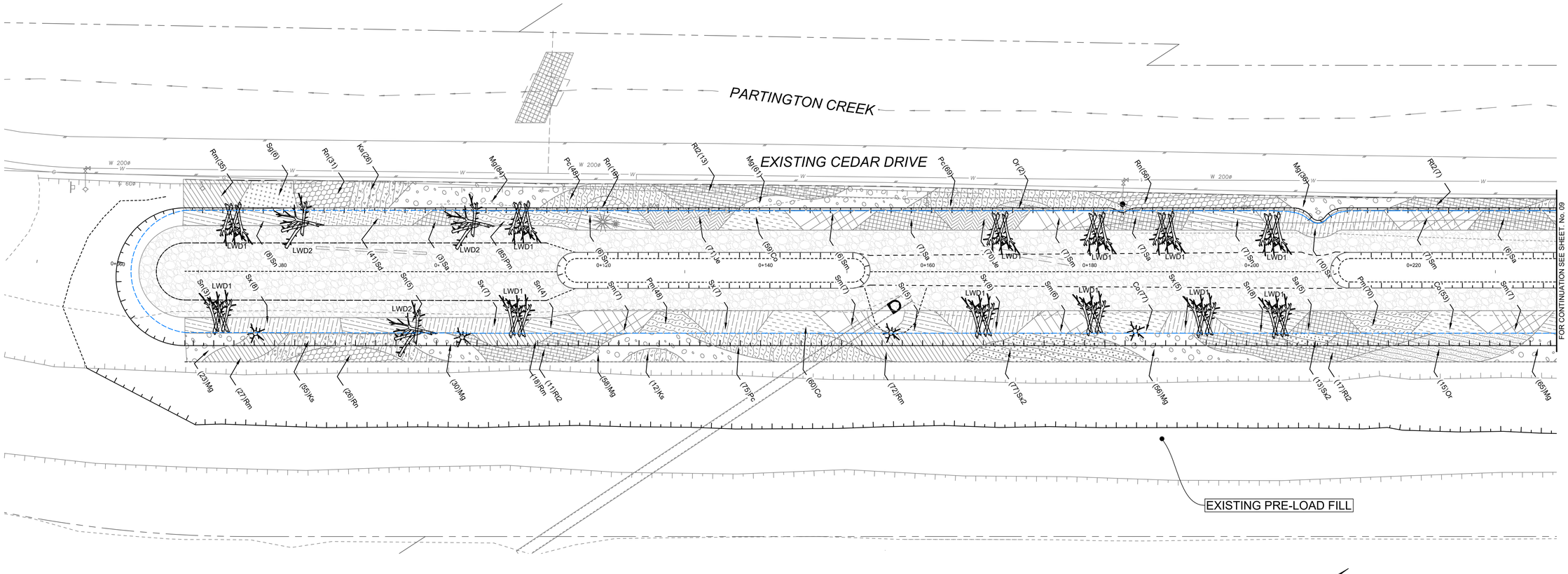

PLANT SCHEDULE - SHRUBS AND GROUNDCOVER

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
SHRUB AREAS						
	Cs2	126	Cornus stolonifera	Red Twig Dogwood	#2 POT	900 mm
	Ks	290	Kalmia microphylla occidentalis	Western Bog Laurel	#2 POT	900 mm
	Mg	814	Myrica gale	Sweetgale	#2 POT	900 mm
	Or	17	Oemleria cerasiformis	Indian Plum	#2 POT	2,000 mm
	Pc	428	Physocarpus capitatus	Pacific Ninebark	#2 POT	900 mm
	Rm	330	Rhododendron macrophyllum	Pacific Rhododendron	#2 POT	900 mm
	Rn	229	Rosa nutkana	Nootka Rose	#2 POT	900 mm
	Rt2	709	Rubus parviflorus	Thimbleberry	#2 POT	900 mm
	Sn	153	Salix hookeriana	Hooker's Willow	Live Stake	2,000 mm
	Sx	127	Salix x `Scouleriana`	Scouler`s Willow	Live Stake	2,000 mm
	Sg	6	Sambucus racemosa	Red Elderberry	#2 POT	2,000 mm
	Sd	254	Spiraea douglasii	Hardhack	#2 POT	900 mm
	Sx2	208	Symphoricarpos x albus	Common Snowberry	#2 POT	900 mm
GROUND COVERS						
	Co	1,093	Carex obnupta	Slough Sedge	#2 POT	600 mm
	Je	539	Juncus effusus	Soft Rush	#2 POT	600 mm
	Pm	651	Polystichum munitum	Western Sword Fern	#2 POT	600 mm
	Sa	685	Scirpus acutus	Hardstem Bulrush	#2 POT	600 mm
	Sm	1,106	Scirpus microcarpus	Small-fruited Bulrush	#2 POT	600 mm

LEGEND	
SYMBOL	DESCRIPTION
	GRAVEL AND BOULDERS
— —	HIGH WATER LEVEL

1:250 0 5 15m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	EZ	AR

Coquitlam

ENVIRONMENTAL PLANTING 3
CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K. P. TERNESS #32295 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)529-2696 F: (604)529-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 08 OF 16 REV. 0

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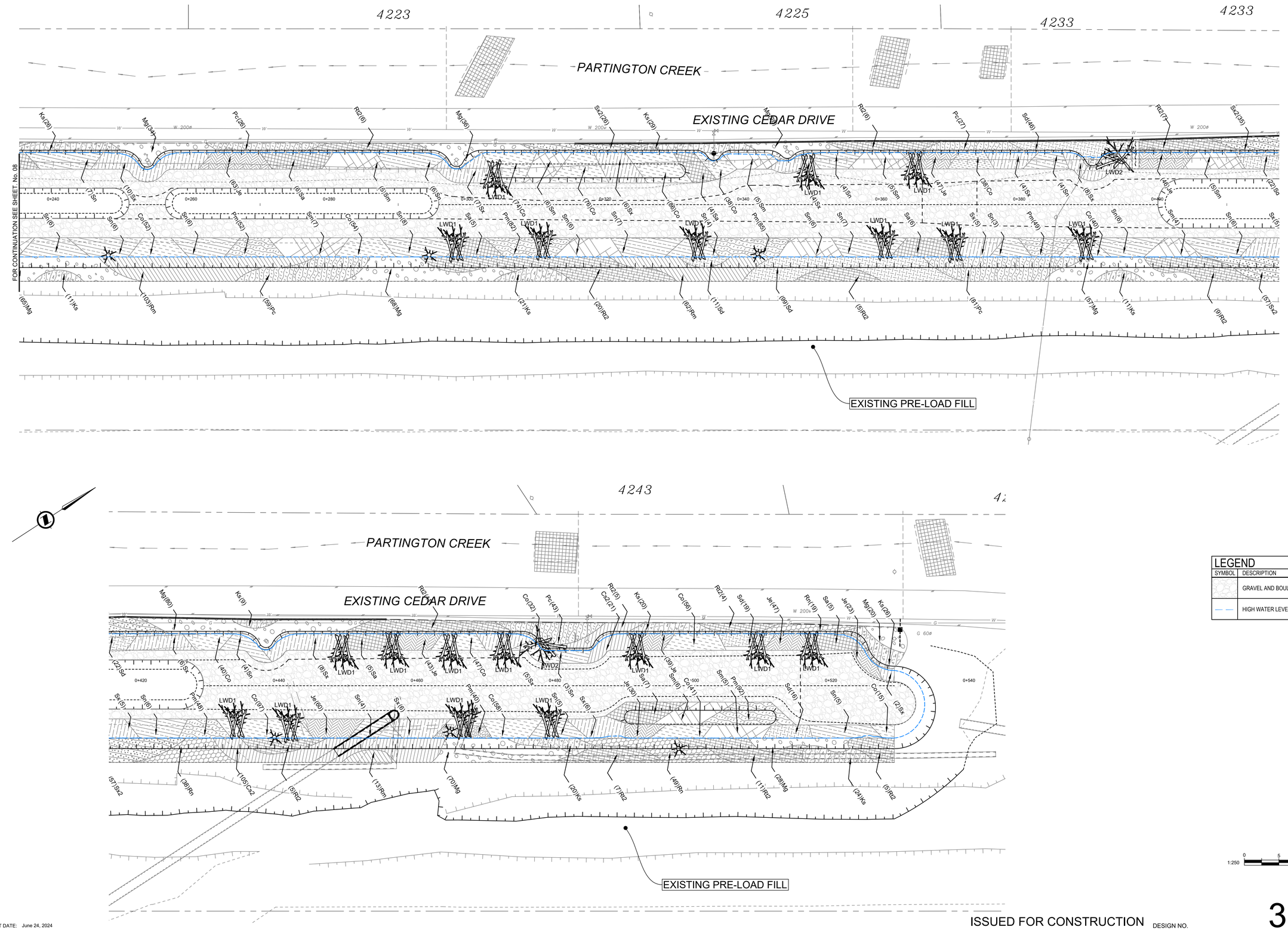

LEGEND	
SYMBOL	DESCRIPTION
	GRAVEL AND BOULDERS
	HIGH WATER LEVEL

1:250 0 5 15m

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION

DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	EZ	AR

Coquitlam

ENVIRONMENTAL PLANTING 4

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K.R.TERNESS #32205 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 09 OF 16 REV. 0

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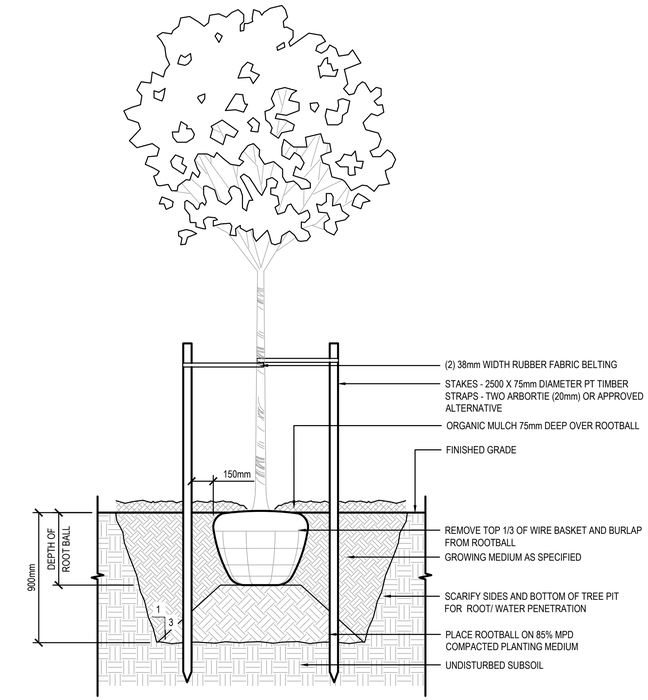
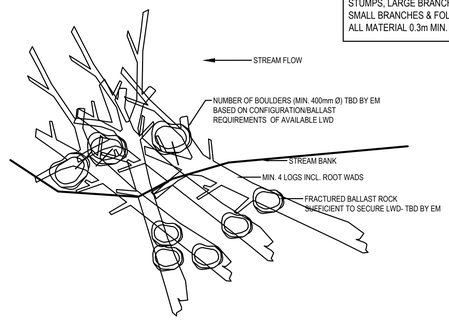
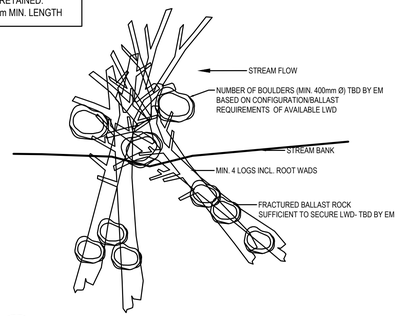


1/10 TREE PLANTING DETAIL
ELEVATION — SCALE 1:20

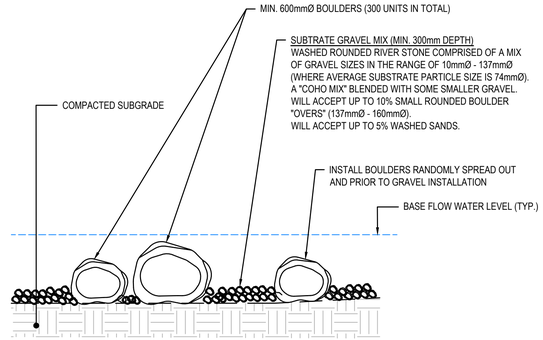
NOTES:
LARGE WOODY DEBRIS MATERIAL INCLUDING BOLES, BOLES WITH ROOTWADS, STUMPS, LARGE BRANCHES, STRIPPED OF SMALL BRANCHES & FOLIAGE. BARK RETAINED.
ALL MATERIAL 0.3m MIN. DIA. AND 3.0m MIN. LENGTH



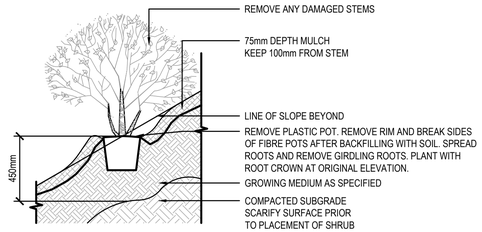
2/10 LARGE WOODY DEBRIS TYPE 1 (PARALLEL)
PLAN — SCALE 1:40



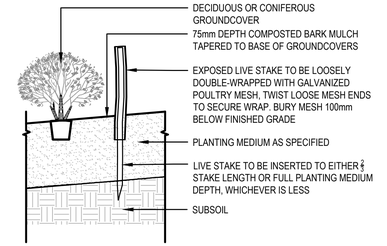
3/10 LARGE WOODY DEBRIS TYPE 1 (TRIANGULAR)
PLAN — SCALE 1:40



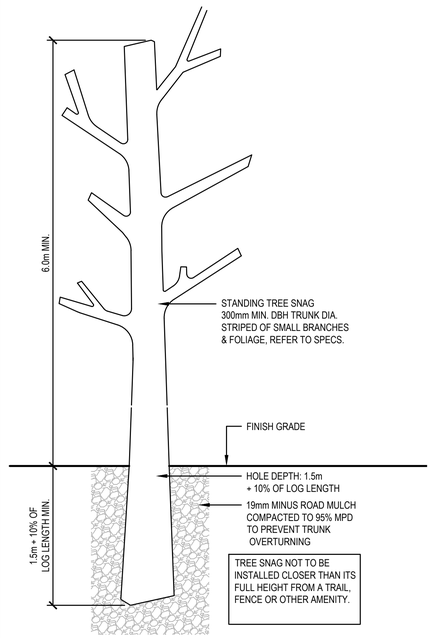
4/10 CHANNEL SUBSTRATE
SECTION — SCALE 1:20



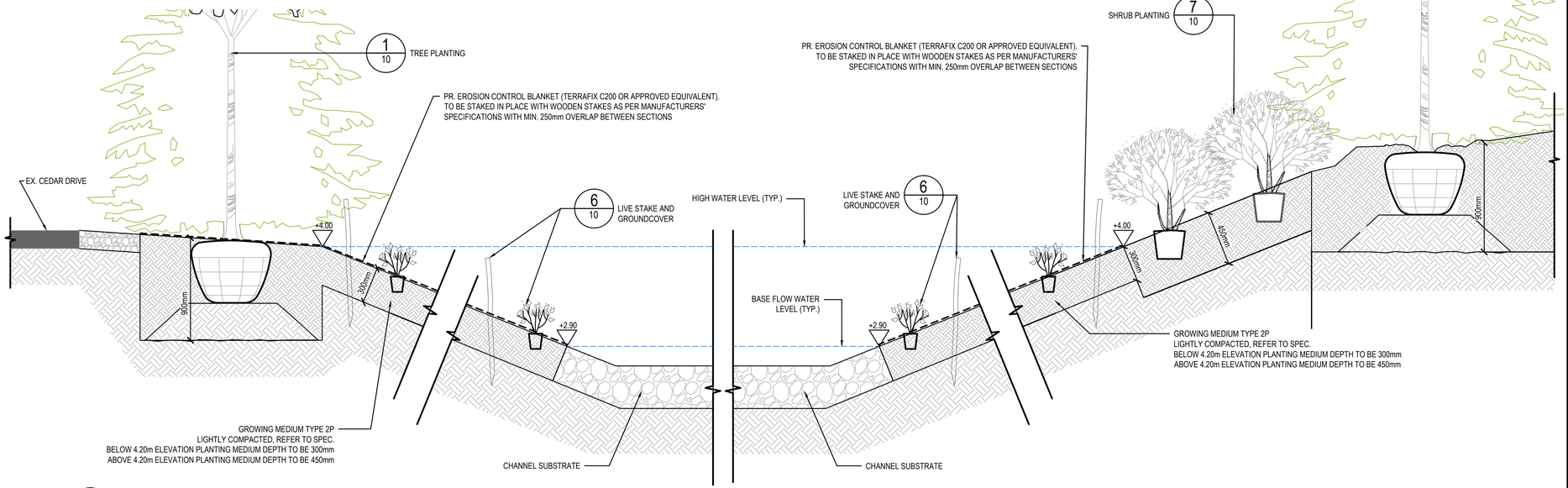
5/10 SHRUB PLANTING DETAIL
ELEVATION — SCALE 1:20



6/10 GROUNDCOVER AND LIVE STAKE
ELEVATION — SCALE 1:20



7/10 TREE SNAG
ELEVATION — SCALE 1:20



8/10 PLANTING SECTION
SECTION — SCALE 1:20

PLOT DATE: June 24, 2024

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	EZ	AR

Coquitlam

ENVIRONMENTAL PLANTING DETAILS
CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. P. TERNESS — #32295 — 2024-06-27

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

ISSUED FOR CONSTRUCTION

DESIGN NO. 33527

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 10 OF 16 REV. 0

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EROSION & SEDIMENT CONTROL GENERAL NOTES

1.ALL WORKS SHALL BE UNDERTAKEN AND COMPLETED IN A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT, SILT OR SEDIMENT LADEN WATER, OR ANY OTHER DELETERIOUS SUBSTANCE INTO ANY DRAINAGE SYSTEM OR WATERCOURSE AS PER THE CITY OF COQUITLAM " STREAM AND DRAINAGE SYSTEM PROTECTION BYLAW NO. 4403, 2013" AND BC WATER QUALITY GUIDELINES.

2. PRIOR TO COMMENCING WORKS WITHIN 30 M OF A WATERCOURSE, ALL ENVIRONMENTAL APPROVALS, PERMITS, NOTIFICATIONS AND AUTHORIZATIONS MUST BE SECURED.

3. IT IS THE SITE CONTRACTOR'S RESPONSIBILITY TO ENSURE NO PERSON SHALL DISCHARGE, DIRECTLY OR INDIRECTLY, WATER WITH A TURBIDITY GREATER THAN 25 NTU INTO THE CITY OF COQUITLAM'S DRAINAGE SYSTEM. WATER TURBIDITY LEVELS UP TO 100 NTU WILL BE ACCEPTED AFTER A RAINFALL EVENT GREATER THAN 25MM/24HR PER THE BURKE MOUNTAIN RAIN GAUGE.

4. THE WORKS SHOWN SHALL BE A MINIMUM REQUIREMENT. THE CONTRACTOR SHALL MODIFY AND/OR PROVIDE ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY TO ACCOMMODATE CONSTRUCTION ACTIVITIES AND ACHIEVE THE DISCHARGE REQUIREMENTS OF THE BYLAW.

5. THE BURKE MOUNTAIN RAIN GAUGE WILL BE REFERENCED FOR RAINFALL DETERMINATION AND INSPECTION FREQUENCY DETERMINATION.

6. AN EROSION AND SEDIMENT CONTROL SUPERVISOR (ESCS) WILL BE RETAINED BY THE DEVELOPER TO INSPECT SITE ACTIVITIES TO ENSURE CONFORMANCE WITH THIS PLAN AND COMPLIANCE WITH THE ESC BYLAW. THE ESCS MUST SUBMIT ESC REPORTS WILL BE SUBMITTED TO ESCReports@coquitlam.ca.

7. THE ESC INSPECTIONS WILL BE UNDERTAKEN WEEKLY WITH BI-WEEKLY REPORTING DURING THE WET SEASON. IN THE DRY SEASON THE ESC INSPECTION WILL BE CARRIED OUT BIWEEKLY WITH MONTHLY MONITORING REPORT, OR AS DETERMINED BY THE CITY.

8. SRE INSPECTIONS WILL BE COMPLETED 48 HOURS PRIOR TO FORECASTED SIGNIFICANT RAINFALL EVENT (SRE) OR DURING AND WITHIN 24 HOURS OF AN SRE.

9. THE CONTRACTOR SHALL OBTAIN SUFFICIENT QUANTITIES OF SILT FENCING, STRAW, CLEAN GRANULAR MATERIAL, POLYETHYLENE SHEETING, ETC PRIOR TO COMMENCING GROUND DISTURBANCE ACTIVITIES.

10. EXPOSED SOIL STOCK PILES ARE TO BE COVERED WITH ONE LAYER OF 6MIL POLY AND WEIGHTED OR STAPLED INTO PLACE.

11. THE CONTRACTOR SHALL INSTALL EFFECTIVE ESC FACILITIES TO PREVENT ENTRY OF SEDIMENT INTO WATERCOURSES AND DRAINAGE SYSTEM.

12. THE CONTRACTOR SHALL MAINTAIN ALL ESC MEASURES AND FACILITIES ON AN AS-NEEDED BASIS. MAINTENANCE MAY INCLUDE BUT IS NOT NECESSARILY LIMITED TO REPLACING SILT FENCING, RE-STAKING FALLEN SILT FENCING, DISPOSAL OFFSITE OF DEBRIS AND SEDIMENT, REPLACING FOULED GRAVEL EGRESS PADS AND CLEANING OUT ANY SEDIMENT CONTROL SWALES.

13. THE CONTRACTOR IS TO AVOID EARTH DISTURBING ACTIVITIES DURING SIGNIFICANT RAIN EVENTS LEADING TO GROUND SATURATION. SIGNIFICANT RAIN EVENTS AND GROUND SATURATION WILL BE DETERMINED BY THE ESCS BASED UPON ON-THE-GROUND INVESTIGATION.

14. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPAIR OR DAMAGE, DIRECTLY RESULTING FROM HIS OPERATIONS AND FOR THE REMOVAL OF DIRT OR DEBRIS FROM EXISTING SYSTEMS, WHICH MAY BE CAUSED BY OR WHICH MAY RESULT FROM WATER BACKING UP OR OVERFLOWING THROUGH, FROM, OR ALONG ANY PART OF THE WORK OR ADJACENT PROPERTIES. THE CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH THESE REPAIRS UNTIL WORKS IS COMPLETE AND ACCEPTED BY THE OWNER(S).

15. MINIMIZE EXPOSURE OF MINERAL SOILS DURING THIS PHASE OF WORKS BY APPLICATION OF STRAW. APPLY STRAW TO 3cm OR WHEN UNDERLYING SOILS ARE NOT VISIBLE. RE-APPLY STRAW, AS IT DEGRADES. THE USE OF HAY SHALL BE AVOIDED AS IT MAY CONTAIN SEEDS OF INVASIVE PLANTS.

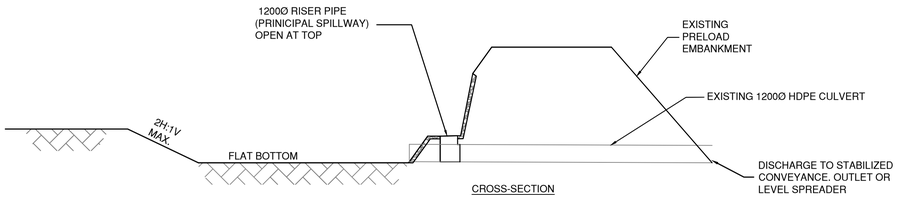
16. PRIOR TO WORKS A PRE-CONSTRUCTION SITE MEETING WILL BE ARRANGED AMONGST THE MANAGING ENGINEER, CONTRACTOR'S SITE SUPERVISOR AND ESCS.

17. TRUCK EGRESS PADS SHALL BE CONSTRUCTED AS PER DETAIL AT THE ENTRANCE/EXIT OF THE SITE.

18. WHEN THE EGRESS PAD BECOMES FOULED, IT WILL BE SCARIFIED TO REMOVE OCCLUDING SEDIMENTS, AND ADDITIONAL CLEAN MATERIAL WILL BE ADDED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

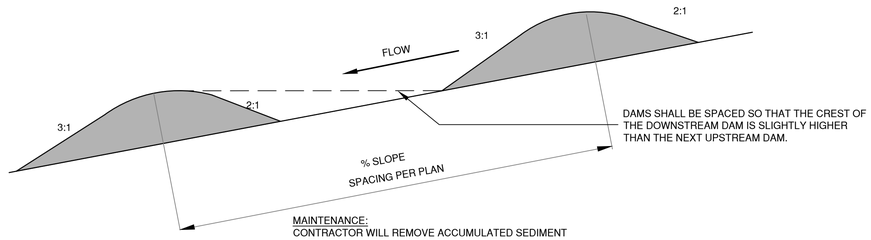
19. ANY SEDIMENT TRANSPORTED ONTO CITY STREETS IS TO BE IMMEDIATELY SWEPT.

20. IF THE ROCK ACCESS PAD AND ROAD SWEEPING IS INEFFECTIVE AT CONTROLLING TRACKING OF SEDIMENT FROM THE SITE, A WHEEL WASH WILL HAVE TO BE INSTALLED AT THE CONTRACTOR'S EXPENSE.

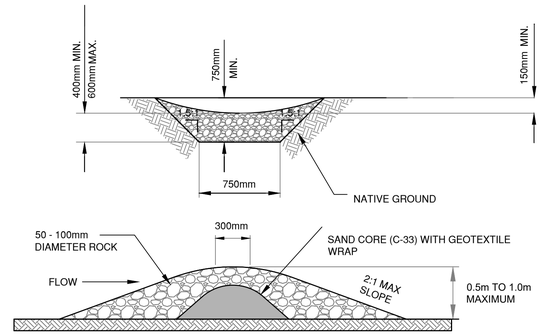


SEDIMENT TRAP WITH RISER PIPE
SCALE: NTS

PROVISIONAL ITEMS



SEDIMENT CONTROL CHECK DAM - ELEVATION
SCALE: NTS



SEDIMENT CONTROL CHECK DAM - SECTION
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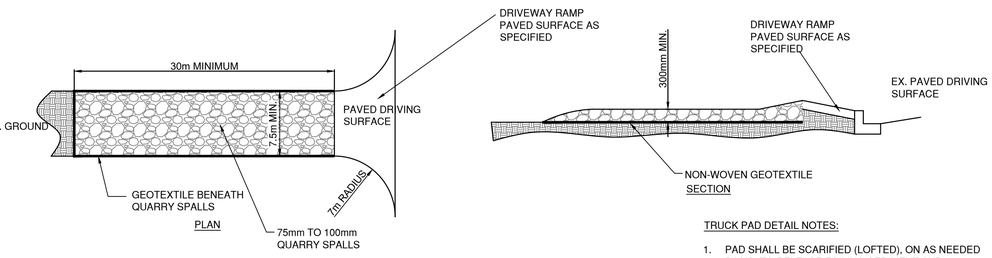
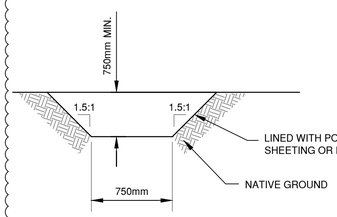


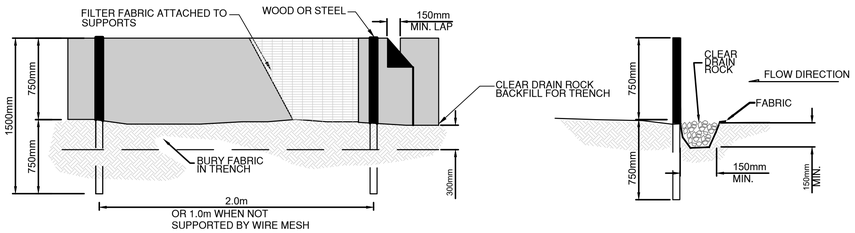
TEMPORARY TRUCK ACCESS PAD DETAIL
SCALE: NTS

TRUCK PAD DETAIL NOTES:

1. PAD SHALL BE SCARIFIED (LOFTED), ON AS NEEDED BASIS, TO RELEASE FOILING SEDIMENT AND REPLACED WHEN SOIL IS EVIDENT ON THE SURFACE OF THE PAD OR AS DIRECTED BY THE ENGINEER/ESC SUPERVISOR.
2. ADDITIONAL CLEAN MATERIAL MUST BE ADDED IF SOIL CONDITIONS DICTATE OR PER THE DIRECTION OF THE ENGINEER/ESC SUPERVISOR.
3. MINIMUM DIMENSIONS MAY BE MODIFIED AS REQUIRED BY SITE CONDITIONS UPON APPROVAL OF THE ENGINEER/ESC SUPERVISOR.



TYP. CONSTRUCTION
SEDIMENT SWALE SECTION
SCALE: NTS



SILT FENCE DETAIL
SCALE: NTS

1:500 0 10 30m

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

PLOT DATE: June 24, 2024

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

ESC NOTES AND DETAILS
CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K.P.TERNESS #32205 2024-06-27

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 11 OF 16 REV. 0

File: C:\Users\gatalde\DCACC\Docs\ISL Engineering and Land Services Ltd-32628_COQ_CedarDrive-Phase1\Roadworks\Project Files\02_CADD\20_Drafting\203_Sheets\Phase 1 - Cedar Drive Upgrades\32628_SH_ESC_Phase_1_2024_Scope.dwg

POND SIZE CALCULATIONS:

Contributing Area = 1.8ha
Max flow length = 380m
Tc = 10 min

Runoff flow (Q)
Q = (R x I x A) / 360
A = 1.8 ha
C = 0.60
I = 29.1 mm/hr (1:2 year event)
Q = 0.087 cu.m/s

Pond Area (A) @ 0.5m depth
A = (1.2 x Q) / Vs
Vs = 0.0006 m/s
MIN. POND AREA = 174 sq.m

EXISTING SANITARY PUMP STATION

#4189

EX 600mmØ CMP CULVERT TO BE REMOVED

PROPOSED SEDIMENT POND:

POND AREA = 180m² (3m x 60m)
BOTTOM OF POND ELEVATION = 1.3m
REFER TO DETAIL ON SHEET 11

TRUCK ACCESS/EGRESS PAD.
REFER TO DETAIL ON SHEET 11

SWALE AND CHECK DAMS (PROVISIONAL)
REFER TO DETAIL ON SHEET 11

PARTINGTON CREEK

#4215

#4223

PARTINGTON CREEK

EXISTING CEDAR DRIVE

EX 200Ø DI WTR

EX 600 DP GAS

FOR CONTINUATION SEE BELOW LEFT

EX 1200Ø HDPE CULV

EXISTING PRE-LOAD FILL

EX 1200Ø HDPE CULVERT TO BE RETAINED

REMOVE 2.8m SECTION OF EX. 1200Ø HDPE CULVERT AND INSTALL 1200Ø - 90° BEND AND VERTICAL RISER.
TOP OF RISER ELEV. = 1.80m.
TOP OF RISER ELEVATION TO BE RAISED TO 3.20m AFTER DECOMMISSIONING OF SEDIMENT POND.

#4196

DISCHARGED WATER MUST MEET BC WATER QUALITY GUIDELINES FOR TURBIDITY

INSTALL RIPRAP AT 1.5H:1V AROUND PROPOSED VERTICAL RISER AND EXTEND TO PROPOSED SEDIMENT POND

#4300

PROPOSED SILT FENCE (PROVISIONAL)
REFER TO DETAIL ON SHEET 11

PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
ESC - PLAN VIEW

SCALE 1:500

PR 9.3m - 1200Ø HDPE CULVERT EXTENSION
C/W 90° BEND AND VERTICAL RISER.
TOP OF RISER ELEV. = 3.20m

EX CULVERTS TO BE REMOVED

EX CULVERTS TO BE REMOVED

TRUCK ACCESS/EGRESS PAD.
REFER TO DETAIL ON SHEET 11

#4223

#4225

#4233

#4243

#4251

PARTINGTON CREEK

PARTINGTON CREEK

EXISTING CEDAR DRIVE

T.O.B. ±4.0

EX 200Ø DI WTR

EX 600 DP GAS

EX 500Ø PVC CULV

EX 500Ø CSP CULV

EX 1200Ø HDPE CULV

EX 200Ø PVC CULV

FOR CONTINUATION SEE ABOVE RIGHT

FUTURE CEDAR DRIVE

EX 1200Ø HDPE CULV

#4300

PROPOSED SILT FENCE (PROVISIONAL)
REFER TO DETAIL ON SHEET 11

EX PRE-LOAD FILL

EX 1200mmØ HDPE CULVERT TO BE RETAINED

EX CONCRETE LOCK BLOCK WALLS TO BE REMOVED

EX CULVERT TO BE FILLED WITH CONTROLLED DENSITY FILL AND ABANDONED

0 10 30m
1:500

PARTINGTON CREEK CONVEYANCE IMPROVEMENT AND OFF-CHANNEL ENHANCEMENT
ESC - PLAN VIEW
SCALE 1:500

PLOT DATE: June 24, 2024

ISSUED FOR CONSTRUCTION DESIGN NO. 33527

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
0	ISSUED FOR CONSTRUCTION	2024/06/24	GA	CJB

Coquitlam

ESC PLAN

CEDAR DRIVE UPGRADES - 2024 CONSTRUCTION WORKS

PROFESSIONAL ENGINEER K. P. TERNESS #32628 2024-06-27

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	AS NOTED	CREATION DATE	DEC - 2023
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 12 OF 16 REV. 0

File: C:\Users\gastaldet\DOCACCDocs\ISL Engineering and Land Services Ltd-32628_COQ_CedarDrive-Phase I\Roadworks\Project Files\02_CADD\20_Drafting\203_Sheets\Phase 1 - Cedar Drive Upgrades\32628_SH_ESC_Phase_1_2024_Scope.dwg