City of Coquitlam

Contract Documents
81832 - Phase 2

2026 & 2027
Cedar Drive Upgrades

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Contract No. 81832 - Phase 2

2026 & 2027 Cedar Drive Upgrades

Project Construction Documents

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The complete **Project Construction Documents** consist of the following parts:

1. Standard Documents – supplied **Page**

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2. Standard Documents – not supplied

i) (available in the "MMCD – General Conditions, Specifications and Standard Detail Drawings")

- Instructions to Tenderers
- General Conditions
  - Schedule 17.5.3 – Letter Agreement with Referee
  - Flow Chart – Changes and Extra Work
  - Flow Chart – Dispute Resolution
- Specifications
- Standard Detail Drawings

ii) City of Coquitlam Supplementary Specifications for Contract Documents

Invitation to Tender

INVITATION TO TENDER

DATE OF ISSUE: **December 22, 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 sq̓əc̓iy̓aʔɬ təməxʷ (Katzie), and other Coast Salish Peoples.

Tender No. 81832 - Phase 2

2026 & 2027 Cedar Drive Upgrades

The City of Coquitlam invites tenders for **Contract 81832 - Phase 2 - 2026 & 2027 Cedar Drive Upgrades**, generally consisting of the following, but not limited to:

- Removal of pre-load,
- Installation of new sanitary main (HDPE pipe provided by City),
- Construction of sedimentation ponds and box culverts (Box culverts provided by City),
- Installation of water main and service connections,
- Construction of new road, driveways and multi-use pathway,
- Installation of environmental planting, irrigation system, ESC measures,
- Maintaining access to all properties on Cedar Drive during all construction phases, and
- 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
January 28, 2026
("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

2026 & 2027 Cedar Drive Upgrades

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: **2026 & 2027 Cedar Drive Upgrades**

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:

- Removal of pre-load,
- Installation of new sanitary main (HDPE pipe provided by City),
- Construction of sedimentation ponds and box culverts (Box culverts provided by City),
- Installation of water main and service connections,
- Construction of new road, driveways and multi-use pathway,
- Installation of environmental planting, irrigation system, ESC measures,
- Maintaining access to all properties on Cedar Drive during all construction phases, and
- 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, **Friday, January 23, 2026.**

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

NOTE: The Purchasing Department at City Hall will be closed at 12PM on Wednesday, December 24, 2025 and will re-open at 8AM on Friday, January 2, 2026. Inquiries will not be reviewed until Friday, January 2, 2026.

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: **January 28, 2026**

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, 2026 and 2027).** 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 C - 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 C– 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: Friday, January 16, 2026
Time: 10:00 AM
Tenderers are advised to attend this site-meeting as this will be an opportunity to familiarize with the site conditions. Any site-related questions will need to be submitted to bid@coquitlam.ca before the inquiry deadline as listed in Clause 1.2 above.

f) The City has pre-ordered the HDPE sanitary pipe and concrete box culverts only, not including the fittings, to address delivery lead time. The pipe and culverts are currently stored in the Location of the Work. The Owner transfers all risk of culvert and HDPE pipe storage, handling, and installation to the Contractor once the Contract between the Contractor and Owner is in place.

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

2026 & 2027 Cedar Drive Upgrades

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)
Wednesday, January 28, 2026

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

January 2026

(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: **2026 & 2027 Cedar Drive Upgrades**
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 **December 31st, 2027**; 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
2026 & 2027 Cedar Drive Upgrades

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 D and ESC Plan (Contract Drawings)	Lump Sum	1		
1.03	(1.9.4)	Temporary shoring to be provided as required to maintain existing road during north culvert installations. Shoring design to be sealed by a professional engineer	Lump Sum	1		
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	1,827		
5.02	(1.4.5)	Concrete Pedestrian Letdowns	Square Meter	48		
5.03	(1.4.5)	Concrete Driveway Letdowns and Aprons	Square Meter	94		
5.04	(1.4.10)	Tactile Strip - 24x48in. Access Tile, Truncated Dome Pattern, Yellow color - Cast-in-place Removable Type	Each	9		
6.0	**04 43 00S**	**CHANNEL SUBSTRATE**				
6.01	(1.3.1)	Channel Substrate Gravel Mix	Tonnes	2,200		
6.02	(1.3.2)	600mm Dia. Boulder (Provisional)	Each	50		
7.0	**26 56 01S**	**ROADWAY LIGHTING**				
7.01	1.9.1	Street and MUP Lighting	Lump Sum	1		
8.0	**31 11 01S**	**CLEARING AND GRUBBING**				
8.01	(1.4.1)	Tree and Shrub Removals, Clearing and Grubbing	Lump Sum	1		
9.0	**31 23 01S**	**EXCAVATING, TRENCHING AND BACKFILLING**				
9.01	(1.10.9)	Imported Trench Backfill (75mm Minus) (Provisional)	Tonnes	400		
10.0	**31 23 23**	**CONTROLLED DENSITY FILL**				

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
10.01	1.4	Infill of Existing 1200mm Dia. HDPE Culvert with Controlled Density Fill (CEMATRIX or Approved Equal) (Provisional)	Cubic Meter	110		
11.0	**31 24 13S**	**ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION**				
11.01	(1.8.5)	Common Excavation - Off Site Disposal, includes stripping and top soil removal (Provisional)	Cubic Meter	13,680		
11.02	(1.8.5)	Common Excavation - Off Site Disposal to local sites (NE Coquitlam) (Provisional)	Cubic Meter	7,000		
11.03	(1.8.5.5)	Common Excavation - Onsite reuse (Provisional)	Cubic Meter	4,300		
11.04	(1.8.5.7)	Relocating boulders (600mm or bigger) on preload and alongside driveways (Provisional)	each	100		
11.05	(1.8.5.8)	Japanese Knotweed Removal and Off Site Disposal (Provisional)	Cubic Meter	1,050		
11.06	1.8.7	Imported Embankment Fill, 75mm Minus (Provisional)	tonne	500		
11.07	(1.8.10)	Overexcavation, Offsite Disposal, Backfilling (includes top soil stripping) (Provisional)	Cubic Meter	200		
11.08	(1.8.14)	Light Weight Fill Material - Pumice Aggregate c/w Geotextile Wrap (Nilex 4551 or Approved Equivalent)	Cubic Meter	1,300		
11.09	(1.8.15)	Japanese Knotweed Removal and Disposal at 1341 Gilleys Trail (Provisional)	Cubic Meter	950		
11.10	(1.8.16)	Regrading of embankment slope (SE section) below tree line after removal of sloughed top soil as shown on Contract Drawings. Work is recommended to be done from the embankment top so as to protect existing Coho Gravel.	Square Meter	1,100		
12.0	**31 37 10**	**RIPRAP**				
12.01	1.4.1	Placing 300mm Riprap for armoring and side slope stability as shown on Contract Drawings (Provisional)	Cubic Meter	150		
13.0	**32 11 16.1S**	**GRANULAR SUBBASE**				
13.01	(1.4.3)	75mm Minus Crushed Granular Sub Base - Road	Tonne	4,230		
13.02	(1.4.3)	75mm Minus Crushed Granular Sub Base - Driveways (Provisional)	Tonne	640		
13.03	(1.4.6)	75mm Clear Crushed Gravel	Tonne	650		
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	5,190		
15.0	**32 12 13.1S**	**ASPHALT TACK COAT**				
15.01	(1.5.1)	Asphalt Tack Coat	Square Meter	8,060		
16.0	**32 12 16S**	**HOT-MIX ASPHALT CONCRETE PAVING**				
16.01	(1.5.1)	Machine Laid Hot Mix Asphalt 50mm (MMCD Upper course #1)	Tonne	990		
16.02	(1.5.1)	Machine Laid Hot Mix Asphalt 50mm (MMCD Lower Course #1)	Tonne	990		
16.03	(1.5.1)	Machine Laid Hot Mix Asphalt (Driveways/Letdowns, MUP) (MMCD Upper Course #2)	Tonne	530		
17.0	**32 17 23S**	**PAINTED PAVEMENT MARKINGS**				
17.01	(1.5.3)	Permanent Thermoplastic Pavement Markings	Lump Sum	1		

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
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) (as per MMCD C13)	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 Cedar Drive)	Each	1		
18.05	1.5.2	4.0m Wide Tubular Swing Gate as shown on Drawing Sheet 07	Each	1		
18.06	(1.5.5)	Supply & Install 5-foot tall (1-foot buried) barbed wire fence - 4265 Cedar Drive East Property Line (match existing type)	lin.m	53		
18.07	(1.5.6)	Fixed Steel Bollards as per COQ-L8	Each	6		
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)	Growing Mediums specified in Contract Drawings	Cubic Meter	7,000		
20.02	(1.4.1)	Bark Mulch (100mm), Composted, Brown Colour as Shown in Contract Drawings	Cubic Meter	150		
21.0	**32 92 19S**	**HYDRAULIC SEEDING**				
21.01	(1.8)	Hydroseed (Provisional)	Square Meter	310		
21.02	1.8.3	Erosion Control Blanket (Terrafix C200 or approved equivalent) installed as per Manufacturer's specifications	Square Meter	11,320		
22.0	**32 92 23S**	**SODDING**				
22.01	(1.8.1)	Sodding	Square Meter	1,950		
23.0	**32 93 01S**	**PLANTING OF TREES, SHRUBS, AND GROUND COVERS**				
23.01	(1.9.1)	Tree - Abies grandis - Grand Fir	Each	30		
23.02	(1.9.1)	Tree - Acer circinatum - Vine Maple	Each	10		
23.03	(1.9.1)	Tree - Alnus rubra - Red Alder	Each	9		
23.04	(1.9.1)	Tree - Alnus sinuata - Sitka Alder	Each	73		
23.05	(1.9.1)	Tree - Betula papyifera - Paper Birch	Each	32		
23.06	(1.9.1)	Tree - Comus nuttallii - Pacific Dogwood	Each	15		
23.07	(1.9.1)	Tree - Crataegus douglasii - Black Hawthorn	Each	31		
23.08	(1.9.1)	Tree - Malus fusca - Oregon Crab Apple	Each	13		
23.09	(1.9.1)	Tree - Picea glauca - White Spruce	Each	6		
23.10	(1.9.1)	Tree - Pinus contorta - Shore Pine	Each	27		

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
23.11	(1.9.1)	Tree - Prunus emarginata - Bitter Cherry	Each	20		
23.12	(1.9.1)	Shrubs	Each	5,312		
23.13	(1.9.1)	Ground Cover	Each	3,369		
23.14	(1.9.1)	Tree - Pseudotsuga menziesii - Douglas Fir	Each	16		
23.15	(1.9.1)	Tree - Quercus garryana - Garry Oak	Each	6		
23.16	(1.9.1)	Tree - Thuja plicata - Western Red Cedar	Each	52		
23.17	(1.9.1)	Tree - Tsuga heterophylla - Western Hemlock	Each	17		
23.18	(1.9.3)	Large Woody Debris	Each	36		
23.19	(1.9.3)	Tree Snag	Each	13		
23.20	(1.9.3)	Bat Box	Each	16		
23.21	(1.9.4)	Wood Wattle Fence on Steep Slopes as shown on Contract Drawings (to be installed as directed by QEP) (Provisional)	Linear Meter	3,220		
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; Contractor to coordiante delivery, unloading, and safety and storage on site)	Linear Meter	472		
25.0	**33 11 01S**	**WATERWORKS**				
25.01	(1.8.2)	200mm DI CL50 Water Main (V-Bio Encased) TR Flex; Approved Native Backfill c/w Steel Casing with RACI spacers (At Road Tie-In North) as shown on Contract Drawings	Linear Meter	151		
25.02	(1.8.3)	200 x 200 x 200 Tee	Each	1		
25.03	(1.8.3)	200 x 200 x 150 Tee	Each	3		
25.04	(1.8.3)	200mm 45 Degree DI Elbow	Each	3		
25.05	(1.8.3)	200mm Gate Valve	Each	4		
25.06	(1.8.4)	50mm Water Service Connection to #4170 (as per COQ-W2e) c/w Terminal City Nelson type valve box, meter setter, and all appurtenances as per Standard Detail WM-3. Existing water service to be removed and capped as per COQ -W2h.	Each	1		
25.07	(1.8.4)	25mm Water Service Connection to #4180 (as per COQ-W2b-2) c/w Terminal City Nelson type valve box, meter setter, and all appurtenances as per Standard Detail WM-2. Existing water service to be removed and capped as per COQ -W2g.	Each	1		
25.08	(1.8.4)	25mm Water Service Connection to #4265 (as per COQ-W2b-2) c/w Terminal City Nelson type valve box, meter setter, and all appurtenances as per Standard Detail WM-2.	Each	1		
25.09	(1.8.5)	Air Release Valve (as per COQ-W6)	Each	1		
25.10	(1.8.7)	Blow-off Assembly (as per COQ-W8)	Each	1		
25.11	(1.8.13)	Existing 200mm Watermain Tie-In	Each	3		
25.12	(1.8.14)	Fire Hydrant Assembly Terminal City C71P c/w Storz (Complete as per MMCD W4)	Each	2		
25.13	(1.8.15)	Existing Fire Hydrant Assembly Relocation c/w Lead Extension	Each	1		
26.0	**33 30 01S**	**SANITARY**				

ITEM NO.	MMCD Ref./ (Supplementary Contract Specifications)	DESCRIPTION	UNIT OF MEASURE	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
26.01	(1.6.2)	375mm SDR35 PVC Sanitary Main; Approved Native Backfill	Linear Meter	417		
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 40 01S**	**STORM SEWERS**				
27.01	(1.6.6)	100mmØ PVC Perforated Pipe Including Day Lighting, Drain Rock, Filter Fabric as shown in Contract Drawings.	Linear Meter	250		
28.0	**33 42 13S**	**PIPE CULVERTS**				
28.01	(1.5.2)	600mm Conc. Culvert (Creek Bypass)	Linear Meter	100		
28.02	(1.5.2)	300mm Conc. Culvert	Linear Meter	20		
28.03	(1.5.2)	Installation of 1.2mx2.1m CONC. Box Culvert; c/w Weir and Coho Gravel As Shown on Contract Drawings (Concrete Culverts are supplied by the City)	Linear Meter	72		
28.04	(1.5.2)	Installation of 0.9mx2.1m CONC. Box Culvert; c/w Weir and Coho Gravel As Shown on Contract Drawings (Concrete Culverts are supplied by the City)	Linear Meter	36		
28.05	(1.5.2)	250mm SDR28 PVC Culvert	Linear Meter	33		
28.06	(1.5.2)	200mm SDR28 PVC Culvert	Linear Meter	37		
28.07	(1.5.2)	200mm Dia. Flap Gate	Each	1		
29.0	**33 44 01S**	**MANHOLES AND CATCHBASINS**				
29.01	(1.5.1.1)	1050mm Concrete Sanitary Pre-benched Manhole Base c/w Slab, Frame and Cover	Each	7		
29.02	(1.5.1.2)	1050mm Sanitary Manhole Risers	Vert. Meter	28		
29.03	(1.5.7)	1050mm Concrete Sanitary Overbuild Manhole Base c/w Benching, Slab, Frame and Cover	Each	2		
29.04	(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
2026 & 2027 Cedar Drive Upgrades

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

INDICATE SCHEDULE WITH BAR CHART WITH CONSTRUCTION DURATIONS

CONSTRUCTION ACTIVITY	2026												2027											
	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC			

Substantial Completion Date: **December 31, 2027**

Note: All instream works to be completed within the Fisheries Construction Work Window from August 01 to September 15 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
2026 & 2027 Cedar Drive Upgrades

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
2026 & 2027 Cedar Drive Upgrades

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
2026 & 2027 Cedar Drive Upgrades

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
2026 & 2027 Cedar Drive Upgrades

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 _____, 2026, 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 _____, 2026.

SIGNED, SEALED AND DELIVERED
In the presence of:

)
)
)
)
_____)

_____
PRINCIPAL

_____
SURETY

APPENDIX 7

FORM OF TENDER

Contract 81832 - Phase 2
2026 & 2027 Cedar Drive Upgrades

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: **2026 & 2027 Cedar Drive Upgrades**

Description of Work:

- Removal of pre-load,
- Installation of new sanitary main (HDPE pipe provided by City),
- Construction of sedimentation ponds and box culverts (Box culverts provided by City),
- Installation of water main and service connections,
- Construction of new road, driveways and multi-use pathway,
- Installation of environmental planting, irrigation system, ESC measures,
- Maintaining access to all properties on Cedar Drive during all construction phases, and
- 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 _____ 2026.

Contract: **2026 & 2027 Cedar Drive Upgrades**

***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 **December 31, 2027,** 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)

2026 & 2027 Cedar Drive Upgrades

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

2026 & 2027 Cedar Drive Upgrades

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: Archaeological Chance Find Procedures

Appendix C: Traffic and Construction Staging Plan

Appendix D: Additional Information

Bound Separately: Contract Drawings

TITLE	CONSULTANT	SHEET NO.	REVISION NO.	DATE
COVER – CEDAR DRIVE UPGRADES – PHASE 2	ISL	00		
GENERAL NOTES	ISL	01	A	2025/12/16
KEY PLAN	ISL	02	A	2025/12/16
ROAD WORKS: TYPICAL SECTIONS	ISL	03	A	2025/12/16
ROAD WORKS: TYPICAL SECTIONS	ISL	04	A	2025/12/16
ROAD + WATER: STA 0+580 TO 0+720	ISL	05	A	2025/12/16
ROAD + WATER: STA 0+720 TO 0+840	ISL	06	A	2025/12/16
ROAD + WATER: STA 0+840 TO 0+980	ISL	07	A	2025/12/16
ROAD + WATER: STA 0+980 TO 1+120	ISL	08	A	2025/12/16
ROAD + WATER: STA 1+120 TO 1+260	ISL	09	A	2025/12/16
ROAD + WATER: STA 1+260 TO 1+390	ISL	10	A	2025/12/16
ROAD + WATER: STA 1+390 TO 1+530	ISL	11	A	2025/12/16
ROAD + WATER: STA 1+530 TO 1+670	ISL	12	A	2025/12/16
ROAD + WATER: GILLEY'S TRAIL	ISL	13	A	2025/12/16
ROAD + WATER: ROAD TIE-IN SOUTH	ISL	14	A	2025/12/16
ROAD + WATER: ROAD TIE-IN NORTH	ISL	15	A	2025/12/16
ROAD WORKS: PROPERTIES 4171 AND 4170	ISL	16	A	2025/12/16
ROAD WORKS: PROPERTIES 4182 AND 4180	ISL	17	A	2025/12/16
ROAD WORKS: PROPERTY 4196 AND 4300	ISL	18	A	2025/12/16
ROAD WORKS: PROPERTY 4265	ISL	19	A	2025/12/16
SANITARY SEWER: STA 0+800 TO 1+080	ISL	20	A	2025/12/16
SANITARY SEWER: STA 1+080 TO 1+420	ISL	21	A	2025/12/16
SANITARY SEWER: STA 1+420 TO 1+660	ISL	22	A	2025/12/16
SANITARY SEWER: GILLEY'S TRAIL	ISL	23	A	2025/12/16
PARTINGTON CREEK AND IN-LINE POND	ISL	24	A	2025/12/16
DRAINAGE CHANNEL	ISL	25	A	2025/12/16
CULVERT DETAILS	ISL	26	A	2025/12/16
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	27	A	2025/12/16
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	28	A	2025/12/16
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	29	A	2025/12/16

TITLE	CONSULTANT	SHEET NO.	REVISION NO.	DATE
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	30	A	2025/12/16
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	31	A	2025/12/16
PARTINGTON CREEK ENHANCEMENT HABITAT	ISL	32	A	2025/12/16
ESC NOTES AND DETAILS: CEDAR DR UPGRADES – PHASE 1	ISL	33	A	2025/12/16
ESC PLAN: CEDAR DR UPGRADES – PHASE 1	ISL	34	A	2025/12/16
IRRIGATION	ISL	35	A	2025/12/16
IRRIGATION	ISL	36	A	2025/12/16
IRRIGATION	ISL	37	A	2025/12/16
IRRIGATION	ISL	38	A	2025/12/16
IRRIGATION	ISL	39	A	2025/12/16
IRRIGATION	ISL	40	A	2025/12/16
IRRIGATION	ISL	41	A	2025/12/16
IRRIGATION DETAILS	ISL	42	A	2025/12/16
CROSS SECTIONS: STA 0+600 TO 0+830	ISL	43	A	2025/12/16
CROSS SECTIONS: STA 0+840 TO 1+070	ISL	44	A	2025/12/16
CROSS SECTIONS: STA 1+080 TO 1+310	ISL	45	A	2025/12/16
CROSS SECTIONS: STA 1+320 TO 1+540	ISL	46	A	2025/12/16
CROSS SECTIONS: STA 1+550 TO 1+650 & GILLEYS TRAIL	ISL	47	A	2025/12/16
TRAFFIC AND CONSTRUCTION STAGING PLAN	ISL	48	A	2025/12/16
STREEET LIGHTING	DMD	1	-	16-12-2025
STREEET LIGHTING	DMD	2	-	16-12-2025
STREEET LIGHTING	DMD	3	-	16-12-2025
IRRIGATION CONTROLLER POWER	DMD	4	-	16-12-2025

Supplementary General Conditions

SUPPLEMENTARY GENERAL CONDITIONS

TABLE OF CONTENTS

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). The City has obtained Change Approval from the Ministry of Water, Land and Resource Stewardship, Stream Management, and the Approval is valid until September 15, 2027. If the Contractor fails to complete instream works within the Fisheries work Windows in 2026 and 2027, the 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.

19.0 TAXES, DUTIES AND GST

19.4 Tariffs or Duties

19.4.1 Tariffs or Duties refer to taxes, levies, or charges imposed by any level of government (including foreign governments) on imported or domestic goods, materials, or equipment used in the performance of the Work. The Contract Price is based on the tariffs and duties in effect as of the date of the Tender Closing. If, after the Tender Closing Date, any new Tariffs or Duties are imposed, or existing rates are materially increased, and such changes directly and demonstrably affect the cost of materials or equipment required for the performance of the Work, the Contractor shall notify the Contract Administrator in writing within ten (10) Working Days of becoming aware of such change,

providing supporting documentation, including but not limited to:

(1) Affected materials
(2) Quantity and cost impact
(3) Evidence of original and new tariff rates
(4) Reasonable efforts made to mitigate the cost impact (e.g., sourcing alternatives)

19.4.2 If the Contract Administrator is satisfied that the Contractor has incurred additional direct costs solely due to the change in Tariffs or Duties, the Owner will issue a Change Order to adjust the Contract Price accordingly. No adjustment shall be made for Tariffs or Duties that were publicly announced or reasonably foreseeable before the Tender Closing Date.

19.4.3 This clause does not apply to costs incurred due to delays caused by the Contractor's procurement or supply chain management. It also does not apply if the Contractor fails to take reasonable steps to mitigate the impact of the change.

19.4.4 If the imposition of new Tariffs or Duties causes unavoidable delays in material delivery, the Contractor may request an extension of the Contract Time under GC 13.3, subject to approval by the Contract Administrator.

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 Construction and/or Major Additions to Existing Structures

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 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: **2026 & 2027 Cedar Drive Upgrades** (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

2026 & 2027 Cedar Drive Upgrades

CONTRACT 81832 - PHASE 2

TABLE OF CONTENTS

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

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 each year.

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 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

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.

1.06 Survey Layout

All Survey Layout will be completed by the City 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.

1.07 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.

1.08 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.

1.09 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.

1.10 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. 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

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.

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 / ARCHAEOLOGICAL REQUIREMENTS

4.01 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

4.02 Kwikwetlem First Nations Guardian Program

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.

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

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.

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.

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.

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.

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

5.0 GRANT FUNDING REQUIREMENTS

5.1 Contract Record Keeping Provisions

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.

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. 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 City 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 made on a lump sum basis. Payment for all work performed under this item will include supply and installation and all other works incidental to installation of sheet piles for this section including removal after construction has been completed. Contractor will be required to have the sheet pile design completed and sealed by a Professional Engineer.

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 maintain access to all properties on Cedar Drive, including the City Pump Station, all business/residential vehicles, cyclists and pedestrian, open access at all times, unless otherwise approved by the Contract Administrator. 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 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.
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 1.03.1	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 1.03.2	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 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 Contract Drawings, Environmental Management Plan (Appendix D – Additional Information), 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. The Contractor must follow ***Appendix B - Archaeological Chance Find Procedures.***

Add 1.9.3 — The Contractor and the site staff will be required to attend a one hour on-site training session regarding Archaeological 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 B.

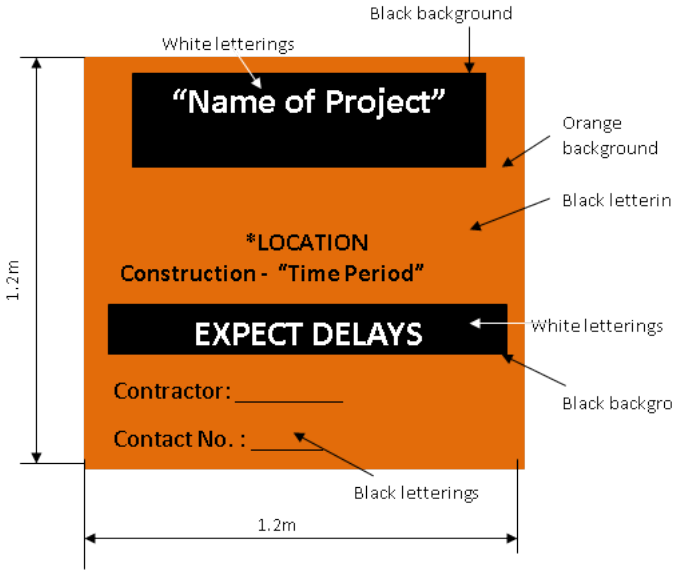
END OF SECTION

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

1.0 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. Payment for channel substrate gravel mix will be based on tonnage delivered to the Place of Work as shown 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.

Installation of Channel Substrate to occur under supervision of Environmental Monitor.

.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 as approved by the Contract Administrator.

.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 to 1.9.1	Lump sum payment for Street and MUP lighting includes supply and installation of all labor, equipment and materials required to complete the installation as specified in the Contract and/or shown on Contract Drawings. Payment includes import backfill and all work as described in Clause 1.9.2.
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 includes removal and disposal of all branches, stumps, trees, debris, hedges, 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 to provide minimum 2.5m vertical and 0.5m horizontal clearance from edge of new road. 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 1.8.5 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. Measurement will be made based on neatline survey of the excavated area.

   The Contractor is responsible for early coordination with the Contract Administrator and City staff to schedule survey for each type of excavation.

2. 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.

3. 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

4. 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.

5. Payment for on-site reuse includes re-shaping, grading, adjustment of moisture content and compaction of the reused material. Payment may be based on neatline survey as directed by the Contract Administrator.

6. 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.

7. Payment for relocating boulders (600mm or bigger) on preload and alongside driveways includes the relocation of existing boulders onsite and installation to locations as shown in the Contract Drawings.

8. Payment for knotweed removal and offsite disposal includes knotweed plant and impacted soil handling, transport, spread prevention, and equipment cleaning and disinfection as described in the Knotweed Management Plan in Appendix D – Additional Information. All excavation

will be carried out under the supervision of Diamond Head Consultants.

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 and removal of existing concrete lock blocks. 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 at least 14 Working Days prior to delivery to the site.

Add 1.8.15

Payment for knotweed removal and disposal at 1341 Gilleys Trail (City lot) 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, installation of silt fencing as per manufacturer's specification, facing uphill with at least 6 inches of the fence installed below the surface grade. Payment also includes all knotweed plant, impacted soil, and site preparation, handling, transport, spread prevention, and equipment cleaning and disinfection, as described in the Knotweed Management Plan in Appendix D – Additional Information. All excavation will be carried out under the supervision of Diamond Head Consultants. The Contractor is to maximize the amount of knotweed and affected soil disposal to 1341 Gilleys Trail before disposal offsite.

Add 1.8.16

Payment for regrading of embankment side slope includes removal of and stockpiling of sloughed top soil, regrading of side slope and filling depressions using soil available on site and compaction. Payment includes checking and protecting the irrigation pipes and sprinklers. Payment will be made based on surface area regraded and considers the recommendation of 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^{o}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^{o} C, relative humidity less than 75 %, and road surface temperature from 10^{o} C to 20^{o} C.

.2 Five (5) minutes at an air temperature of 32^{o} C, relative humidity less than 75 %, and road surface temperature from 35^{o} C to 50^{o} 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 barbed wire fence c/w 5-foot tall wooden posts (incl. 1-foot buried), barbed wire, and galvanized steel mesh (match existing type) at property line and removal and offsite disposal of existing wire fence.
		Add 1.5.6	Payment under this item includes supply and installation of fixed steel bollards as per COQ-L8 set into concrete base.

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 of growing medium, bark mulch, and imported top soil that is free from any noxious weeds, fungal growth, mushroom, and any contaminants. Payment will be made separately for each different type 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.

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 premixed 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.
		Add 1.9.4	Payment for Willow Wattle Fences shall be made at the unit price bid per lineal meter. Payment shall be considered full compensation for all costs for equipment, materials, and labour for the supply and installation f live willow wattle fences, including harvesting, cutting, storing, excavating, planting, staking, backfilling, and compaction. Final locations will be veirified in the field by the QEP.

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.

The City has pre-purchased the 450mm diameter HDPE Grey Pipe, excluding fittings. The pipe is currently stored onsite. The Owner transfers all risk of culvert and HDPE pipe storage, handling, and installation to the Contractor once the Contract between the Contractor and Owner is in place.

.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. The pipe is currently stored at the Location of the Work. The Owner transfers all risk of pipe storage, handling, and installation to the Contractor once the Contract between the Contractor and Owner is in place.

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, removal and offsite disposal of existing water mains and hydrants where shown in Contract Drawings, supply and installation of all pipe, 450mm diameter SCH40 steel casing c/w RACI Spacers (at Road Tie-In North as per Contract Drawings), 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 Drawing, as described in Schedule of Quantities and Prices, and as specified under this Section. 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 water service connection installation or extension includes mainline saddles, corporation stops, curb stops, #10 AWG tracer wire, PVCO service pipes, municipex service pipes, Type K Copper service pipes, all valve boxes c/w Terminal City Nelson Type style valve box with lid marked “WATER”, and all related fittings and appurtenances specified and/or shown on Standard Detail Drawings COQ-W2e, COQ-W2b-2, COQ-W2g, COQ-W2h, WM-2, and WM-3.

Payment includes all applicable work described in 1.8.2 of this section.

Measurement for service connection will be for each complete service installed, including all appurtenances, length of service pipe installed and length of riser, and removal of existing services as shown on Contract Drawings.

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, fittings, mechanical couplings, test points, temporary blow off assembly, excavation to expose the existing main to confirm location, grade, size, material and condition, capping of existing watermain. Payment will be made per a Lump Sum basis for each tie-in or wet tap connection. Pressure and leakage testing cannot be performed against live gate valve. Payment includes all applicable work described in 1.8.1 and 1.8.2.

Add 1.8.14

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.

Add 1.8.15

Payment for existing Hydrant Assembly relocation includes re-use of existing hydrant assembly and extension of the hydrant lead. Payment includes all applicable work described in 1.8.2 of this section.

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. Purpose and Scope
   - .1 To remove any possible contaminants introduced into the water main through pipe storage or installation activities.

2. Swab Requirements
   - .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. Swab Entry Point
   - .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 trench excavation, dewatering, bypass pumping, on-site reuse of surplus/displaced material, removal and disposal of existing pipes and culverts, supply and installation of all pipe, wyes, cap, fittings and related materials, tie-ins to existing or new storm pipe or manhole other than noted in Clause 1.6.9, construction joints, bedding, 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; and 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 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. Payment for concrete driveway and curb & gutter will be made under Section 03 30 20S. Payment includes by-pass pumping to include all pumps, labour and materials required to facilitate the work. Payment for the by-pass pumping will be incidental. Measurement for storm sewer will be made along the ground from the start of new pvc pipe to the terminus of the new pvc pipe.
		Delete 1.6.4 and replace with	Payment includes support of poles if necessary and manhole barrel preparation to accommodate the service connection.
		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 (regardless of depth).
		Delete 1.6.6 and replace with the following	Payment for perforated drain pipe includes applicable materials and work described in 1.6.2 of this Section and will be made separately for each size of pipe and will include drain pipes, drain rock and filter fabric, surround and daylighting as shown in Contract Drawings. Payment will be made for the lineal meters of perforated PVC pipe installed.
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 concrete 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. The owner has pre-ordered the Concrete Box Culverts only, not including fittings, to address lead time on pipe materials. The Box Culverts are currently stored at the Location of the Work. The Owner transfers all risk of culvert storage, handling, and installation to the Contractor once the Contract between the Contractor and Owner is in place.
		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.

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. Manholes to be installed as caison or other approved method where shown in Contract Drawings.
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

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

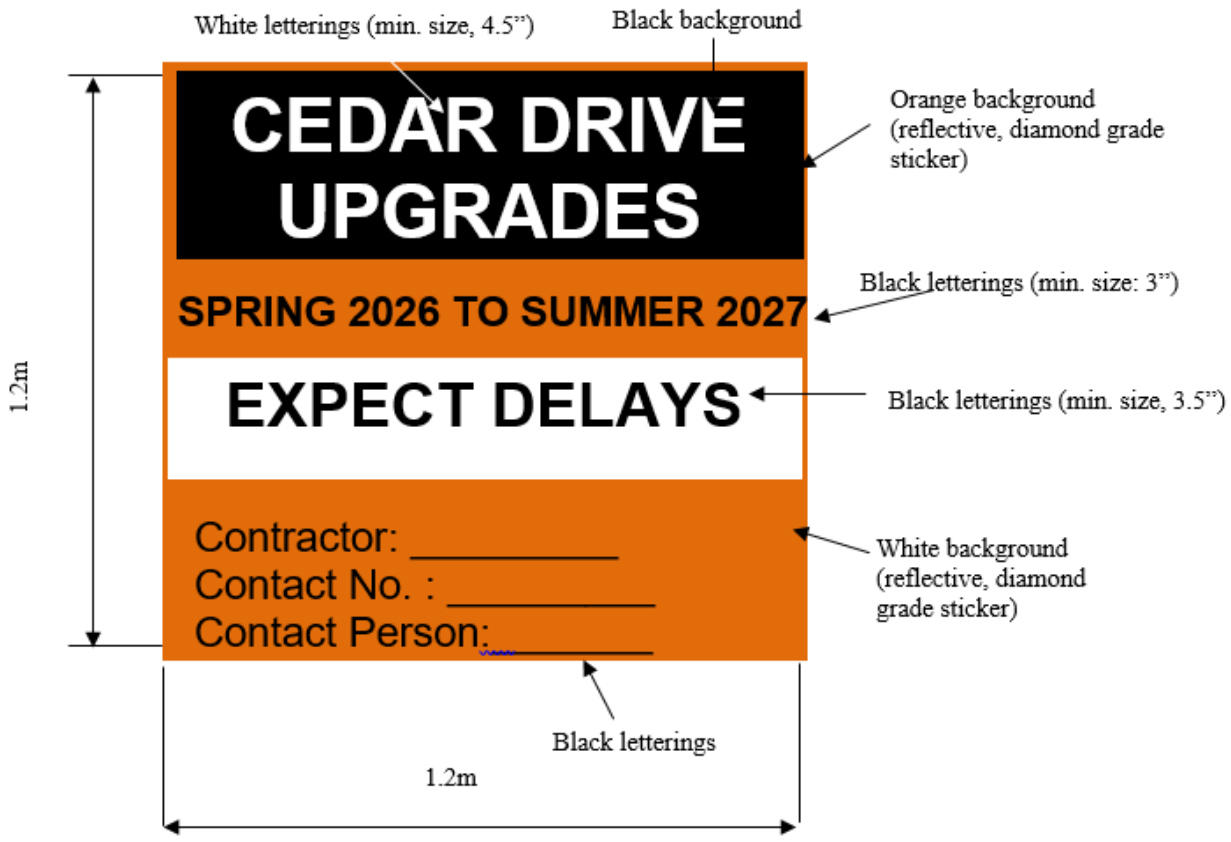
.1 The Contractor is required to provide, one week prior to start of work, six stationary signs at intersections, one in each direction, to inform traffic of existing and anticipated conditions at entry points of the lane to be worked on, locations for these signs will be provided by the Contract Administrator. 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 -

Archaeological Chance Find Procedures

Archaeological Chance Find Procedures

City of Coquitlam

DRAFT 2

November 2021 (version 2)

BROWN & OAKES
ARCHAEOLOGY

Table of Contents

Introduction

This document is presented as an accompaniment to Kwikwetlem Cultural Heritage and Archaeology Chance Find Procedures training provided by Brown & Oakes Archaeology to City of Coquitlam (or the “City”) staff and contractors.

The Chance Find Procedure (CFP) is intended to provide City planners and onsite project personnel guidelines for the appropriate response to an unanticipated discovery of known or suspected archaeological or cultural heritage materials during City operations. A CFP is NOT a substitute for professional archaeological assessment of project areas considered to hold archaeological potential. Thorough archaeological assessment will always reduce project risk of harms to protected archaeological sites and minimize the potential for encountering unanticipated material. This CFP training is intended to promote the preservation and proper management of heritage resources that are unexpectedly encountered during City activities.

The document presents a summary of archaeology site protection legislation, steps to follow in the case of suspected or observed archaeological materials, a list of appropriate authorities to contact in the case of archaeological site encounters, and a guide to archaeological site and materials recognition. Information on Kwikwetlem culture history and connections to traditional lands is not presented in this document and this information is best shared via virtual or in-person presentations.

Purpose

The purpose of CFP documentation is to aid in the protection and proper management of archaeological materials encountered during City of Coquitlam activities. Many land-altering activities have the potential to expose and/or negatively impact undocumented archaeological materials.

The purpose of this document is to:

- Ensure project personnel are aware that undocumented archaeological sites are likely to be present in the City of Coquitlam.
- Promote awareness of activities that may lead to the exposure of archaeological materials, including excavations, vegetation clearing, field survey and inspections, and more.
- Provide personnel the appropriate steps to follow if suspected or observed archaeological resources are encountered during work or personal activities.
- Provide education and resources to assist recognition of archaeological site types and materials in the lower Fraser River region.

Archaeological Sites in British Columbia

Archaeological sites are places that exhibit physical evidence of past human activity. Archaeological sites in British Columbia are automatically protected under the *Heritage Conservation Act* (HCA) when located on provincial, crown, municipal, or private land[1]. The vast majority of archaeological sites in BC include places and belongings of Indigenous peoples. Some post-1846 sites related to newcomer history may also be registered and protected under the HCA if of significance to a place, industry, or region, for example. HCA protection is extended to ship and plane wrecks more than 2 years old.

Many First Nations consider the widely accepted definition of an archaeological site as a place featuring only the material remains of human activity too restrictive and instead advocate for the recognition and protection of a wider range of "cultural heritage" site types, including places of spiritual significance, named locales, known travel routes, and other places of cultural value.

The majority of the City of Coquitlam has not been surveyed for archaeological sites and it is reasonable to expect that many archaeological sites are buried and/or undetected. These sites are collectively referred to as undocumented archaeological sites.

HCA Legislation and Policies

Archaeological sites are automatically protected under the terms of the *Heritage Conservation Act* whether known or undocumented. Sites are protected whether previously disturbed by historic activities or intact. The HCA prohibits the alteration or disturbance of archaeological sites in whole or in part, on provincial public and private lands, whether impacts are intentional or inadvertent, and irrespective of previous land disturbance.

The HCA provides substantial penalties for the destruction or unauthorized disturbance of archaeological sites including imprisonment for up to two years and fines of up to $1,000,000.

Alterations to archaeological sites may proceed under appropriate HCA permits held by professional archaeologists following provincial assessment guidelines[2]. Work plans and methodologies related to archaeological site investigations must meet provincial regulatory standards and are expected to conform to participating First Nation cultural heritage policies and best-practice standards.

Archaeological materials on federally managed lands may be protected by other legislation and policies. Many federal agencies will adhere to the requirements outlined in the *HCA* when managing archaeological sites.

[1] http://www.for.gov.bc.ca/archaeology/index.htm.

[2] The HCA is administered by the Archaeology Branch, Ministry of Forests, Lands, Natural Resources and Rural Development.

First Nation Cultural Heritage Management

Many BC First Nations maintain cultural heritage policies and/or heritage permitting systems to assert oversight over Indigenous cultural heritage management and to ensure a high standard of archaeological practice. Contact should be made with locally affected Nations prior to any heritage study or project work with the potential to encounter cultural heritage materials to ensure adherence to Nation-preferred heritage protections, permits, and policy.

Potential to Encounter Archaeological Sites

Any project involving ground alterations has the potential to expose undocumented archaeological sites. Common forms of ground disturbances that have led to site discoveries include land grading, vegetation clearing/grubbing, excavation, asphalt/concrete removal, geotechnical drilling, access road or trail building, foundation demolition, heavy equipment movement, habitat planting, stream and pond channeling or dredging.

Other kinds of work activities where teams may encounter undocumented archaeological sites include field teams working in proximity to natural, undeveloped or minimally disturbed terrain. Teams involved in field surveys, field inspections, or inventories of natural ground and waterways, riparian areas, municipal parks and trails, forested areas, cut bank or erosion area, and so on may encounter exposed archaeological materials.

City workers or contractors engaged in any activity that may result in archaeological materials identification should be made aware of HCA site protection legislation and field supervisors properly versed CFP procedures.

Types of Archaeological Sites

The following site types are well-known across the lower Fraser River region and may be encountered in the City of Coquitlam. The following site types may contain a range of artifact types and sediment signatures.

- **Stone tool sites** containing isolated artifacts or accumulations of stone tool working debris.
- **Habitation sites** show accumulations of food remains, tools, and evidence such as hearths indicating short term and seasonal camps and settlements used for travel and resource procurement as well as large and permanent villages.
- **Surface features** such as cultural depressions created by former habitations, earthen fortifications, burial mounds, and rock cairns.
- **Wet sites** contain preserved organic materials like woven basketry or wood tools in addition to other cultural material; these sites form under special preservation conditions typically anaerobic water saturated sediments along waterways and floodplains.
- **Culturally Modified Trees (CMTs)** include bark stripped trees, planks, and territory markers.
- **Rock art** including pictographs (painted rock images) and petroglyphs (images carved or pecked into rockfaces or boulders).

Archaeological Chance Find Procedure

In the event of found or suspected archaeological material, follow the procedures outlined below.

STEP 1: WATCH for potential archaeological materials

- ⇨ Know that undocumented archaeological sites are expected throughout Coquitlam.
- ⇨ Know that archaeological materials are protected by law and must be reported.
- ⇨ If you believe you may have encountered archaeological materials (either intact or disturbed) follow the steps outlined below.

STEP 2: STOP work in proximity to the material

- ⇨ If known or suspected archaeological materials are encountered, STOP work in the immediate vicinity.
- ⇨ Do not disturb, move, relocate, or collect the material.

STEP 3: REPORT observed materials

- ⇨ Alert the site supervisor that suspected archaeological materials have been observed.
- ⇨ The site supervisor will ensure appropriate contact is made with City managers who will in turn reach out to archaeological professionals.

STEP 4: CONTACT archaeological professionals

- ⇨ Seek immediate advice from an archaeological professional.
- ⇨ Teams may be advised to protect the area with flagging or cones until the area can be assessed by the appropriate representative.
- ⇨ Teams may be requested to provide locational details or photographs of the material.

STEP 5: AWAIT advisement

- ⇨ Wait for instructions from the appropriate representative; do not begin ground disturbing work until cleared to do so.
- ⇨ Prepare and submit an incident report to ensure compliance with appropriate regulators and interest groups.

Archaeological Chance Find Procedure - Suspected Ancestral (Human) Remains

In the event of found or suspected human remains, follow the procedures outlined below*.

STEP 1: STOP all activity at the job site immediately, including the removal of backfill. Do not rebury the remains.

STEP 2: REPORT to the City Project Manager. The Project Manager will contact an archaeological professional and determine the appropriate course of action. In most cases, the archaeology professional will visit the site to determine if the materials are reasonably expected to be human and archaeological. If warranted, the consultant will notify the Archaeology Branch and the RCMP, the Office of the Coroner, and affected First Nations. The Coroner will affirm whether the remains are archaeological and not of forensic concern. The archaeologist will inform the Archaeology Branch and First Nations will be consulted to determine culturally appropriate handling protocols and subsequent project management options.

STEP 3: PROTECT the affected location with flagging or cones to prevent additional disturbance and for privacy. Do not photograph the material.

STEP 4: TREAT the remains with dignity and respect. Do not allow bystanders to take photographs or video.

STEP 5: AWAIT advisement.

* If it is reasonable to think the human remains are not archaeological but forensic in nature, an immediate call to the RCMP is required.

Management Options

If determined that an archaeological or cultural heritage site (intact or disturbed) is present, an archaeologist will coordinate communications with the City, local affected First Nations, and the Archaeology Branch to evaluate management options. Archaeology Branch and First Nations approval and additional permitting may be required prior to the implementation of management options.

Examples of potential management options are provided below. Options will vary based on site characteristics, proponent needs, and Archaeology Branch and First Nation requirements.

Option A: Site avoidance through project redesign or relocation. Site avoidance is always preferred. Avoidance minimizes impacts to irreplaceable archaeological sites and reduces cost and schedule impacts.

Option B: Systematic data recovery through controlled archaeological excavation or other method. Data recovery is destructive to archaeological sites and will entail consideration of costs and schedule coordination.

Option C: Monitoring of construction activities by a professional archaeological team. Monitoring is appropriate where project impacts cannot be evaluated before construction (due to impenetrable surfaces or underground facilities, for example) or where potential to encounter archaeological materials is present following impact assessment or systematic data recovery.

Best Practices for CFP Implementation

- A Chance Find Procedure is best applied as an outcome stemming from archaeological assessment – as a last step verification that archaeological materials have not been overlooked in project area assessments, or where there is a professional assessment that documents a low expectation for encountering archaeological materials in a work area.
- A Chance Find Procedure is not an acceptable replacement for a professional archaeological overview (AOA) or archaeological impact assessment (AIA) or a well-designed and implemented archaeological construction monitoring plan for many areas. Engagement with professional archaeological teams, affected First Nations, or the Archaeology Branch will assist in appropriate heritage study approaches.
- Chance Find Procedure training must be delivered by professional archaeologists and local area First Nations who wish to contribute to CFP presentations.
- Chance Find Procedures should be summarized regularly as part of job or project requirements, and CFP training repeated by the archaeological and First Nation team for new employees, project teams, and subcontractors.
- Chance Find Procedures do not supersede any requirements or policies pertaining to cultural heritage management by First Nations with interests in the area. Proponents are encouraged to seek input from interested First Nations on area-specific CFPs as part of any project engagement process.

Contact List

Archaeology Branch

Paula Thorogood	Planning and Assessment Manager	250-953-3300	Paula.Thorogood@gov.bc.ca
Nathan Friesen	Planning and Assessment Supervisor	250-953-3306	Nathan.P.Friesen@gov.bc.ca

City of Coquitlam

Main Reception		604-927-3000

Police and Coroner

RCMP (Non-emergency)	Coquitlam	604-945-1550
BC Coroners Service	Lower Mainland Region	604-660-7708

Area First Nations

Kwikwetlem First Nation	604-540-0680
Katzie First Nation	604-465-8961
Kwantlen Nation	604-888-2488
Musqueam Indian Band	604-263-3261
Stó:lō Nation	604-824-2420
Tsleil Waututh Nation	604-929-3454

Archaeological Site and Materials Identification

The following archaeological sites and artifacts are common to the lower Fraser River region. This guide is to assist in the recognition and protection of archaeological materials found by chance. If you identify any archaeological material, stop work immediately and contact a professional archaeologist.

Artifacts

Artifacts are objects made or modified by humans and may be formed of stone, bone, antler or wood. Bone, antler and wood tools were produced in abundance, but stone artifacts are the most common artifacts found in the lower Fraser region because of the preservation durability of stone. Bone and antler were fashioned into a variety of items, including needles, knives, points, jewelry, awls and scrapers. Wood was used to make implements like spoons and bowls, handles, ceremonial objects, canoes, houses, and much more.

Photo Credit: RBCM, Archaeology Collection. Antler and wood tools (https://learning.royalbcmuseam.bc.ca)

Stone tools common to this region include projectile points, knives, adzes (axes), scrapers, mauls (hammers), net weights, beads, and more. Archaeologists distinguish chipped stone from ground stone artifacts, each distinguished by the mode of manufacture, either flaking scars or grinding and polishing marks. Stone flakes or ‘debitage’ is produced during the process of making stone tools. These flakes were sometimes used as tools themselves or were left behind at the stone tool working site. Culturally produced debitage shows features distinctive from naturally broken rock, gravel or crush, but these signatures can be difficult to identify to an untrained eye. Stone artifacts were produced from dacite, quartzite, slate and nephrite as well as obsidian, chert, and other materials. Stone was acquired locally or transported or traded over long distances; high-quality materials like obsidian has been traced to locations from Prince Rupert to Oregon and beyond.

Artifacts may be found as isolated finds or in association with other cultural materials.

Photo Credit: B&OA, Chipped stone artifacts from Coquitlam Lake.

Photo Credit (left): B&OA, Nephrite ground stone adze from Port Coquitlam. Photo Credit (right): RBCM, Archaeology Collection. Ground stone hand mauls (https://learning.royalbcmuseam.bc.ca)

Photo Credit: B&OA, Stone tool debitage from BC Interior.

Beads

Beads were made from a variety of materials including stone, shell, bone and glass (in more recent times). Shell and stone disc beads were used in jewelry, regalia and in mortuary practices across the Northwest Coast. On the Lower Fraser it is most common to find stone beads at archaeological sites fashioned from mud or silt stone, slate, or other softer stone. At some burial sites, individuals of rank were laid to rest with thousands of stone and shell beads.

Photo Credit: B&OA, Ground stone beads from near Agassiz.

Indigenous Historical Artifacts

Indigenous use of European materials in the years following contact are often found in early historic sites. Ceramics, glass, and metal were valued for their strength, durability, ease of access, or aesthetic properties. Glass was worked using traditional stone tool techniques in the same way as obsidian (a natural volcanic glass). Clay pipes were adopted by Indigenous peoples who several centuries earlier had introduced the practice of tobacco smoking to European traders. Glass beads were used by European fur traders to trade with Indigenous peoples; trade beads were initially valued for their vibrant colour and the expectation of beads as a wealth item.

Photo Credit (left): B&OA, Worked glass and clay stone pipe, Coquitlam.

Photo Credit (middle): https://www.canadashistory.ca/explore/fur-trade/tobacco-pipes. Photo Credit: Oregon Museum of Natural and Cultural History, Glass trade beads (https://mnch.uoregon.edu/index.php/collections-galleries).

Hearths

Hearths are the remnants of fires identifiable by dense black charcoal, ash and heat oxidized sediments. While natural forest fires may also leave traces of burning, hearths tend to be more defined and frequently show concave bases, evidence of repeated use, and contain or are in proximity to burned bone, fire-altered rock, and artifacts.

Fire-Altered Rock

Fire-altered rock (FAR) is rock modified by repeated heating and cooling. Heating small, rounded river cobbles and immersing the hot stones in water filled baskets or boxes was a frequently used cooking technique called ‘stone boiling’. Heated stones were also used to warm clothing and bedding. The repeated heating and cooling of FAR created distinctive fracture and colour patterns that are easily distinguished from naturally broken rock. FAR shows irregular breakage patterns, is frequently deeply pitted, is often deep rust or black in colour, and may be found mixed in charcoal and ash laden sediments. As FAR is often found in abundance around settlement areas or near cooking features and hearths, it is a frequent first indicator of the presence of archaeological sites. Often mixed in FAR deposits are boiling stones—small, rounded pebbles that have not yet been fractured by thermal processes

Photo Credit: B&OA, Fire altered rock, Coquitlam.

Shell and Non-Shell Midden

Midden deposits are generally indicative of camp or village sites. Middens accumulate through the repeated, ongoing use of an area where food remnants or the debris of daily living build up in layers at a site over time. In coastal areas, shellfish provided an abundant food source and, middens contain abundant fragmented or whole shell typically embedded in dark, greasy, sediments rich in charcoal, ash, fire cracked rock, burnt materials, and artifacts. Because shell neutralizes the acidity in soil, shell middens enhance preservation of organic food remains and tools, and fish and mammal bone, wood, antler, and botanical remains are often well-preserved in shell midden sites.

Non-shell middens are accumulations of living materials formed at camps and settlements away from marine waterways. Non-shell midden shows layered deposits of dark sediments, ash, and sometimes sand and clay in sediments with little to no shell. These deposits rarely contain bone, antler, or wood remains due to poorer preservation environments.

In Coquitlam, non-shell middens are the more common site type but there are a few examples of inland shell midden sites associated with camps or settlements where shellfish was transported to locations by travel or trade.

Photo Credit (left): B&OA, Non-shell stratified midden Port Coquitlam. Photo Credit (right): Shell midden, Vancouver Island (*https://learning.royalbcmuseum.bc.ca/pathways/can-)*

Surface Features

Surface features are non-portable cultural formations visible on the landscape. Features may include pits or depressions, earthen mounds or rock cairns, petroforms (rock arrangements) or trails. Cultural depressions may indicate the location of semi-subterranean winter dwellings, plank houses where midden accumulated around the outside of structures, cache pits used for tool or food storage, or pits and trenches used for food cooking or processing. Cultural depressions are identifiable by their uniform shape (usually round or rectangular), a berm may be present around the edge of features, the presence of associated artifacts, or concentrations of charcoal, ash, and fire altered rock.

Cultural mounds or rock cairns are other familiar surface features. Earthen burial mounds and rock cairns are part of a mortuary tradition found throughout the lower Fraser region over the past 1,500 years. Cultural mounds and cairns range in size from around a meter in diameter to more than 12 meters across. Individual occurrences or clusters of well-formed oval or circular mounds of earth and rock should trigger archaeological assessment.

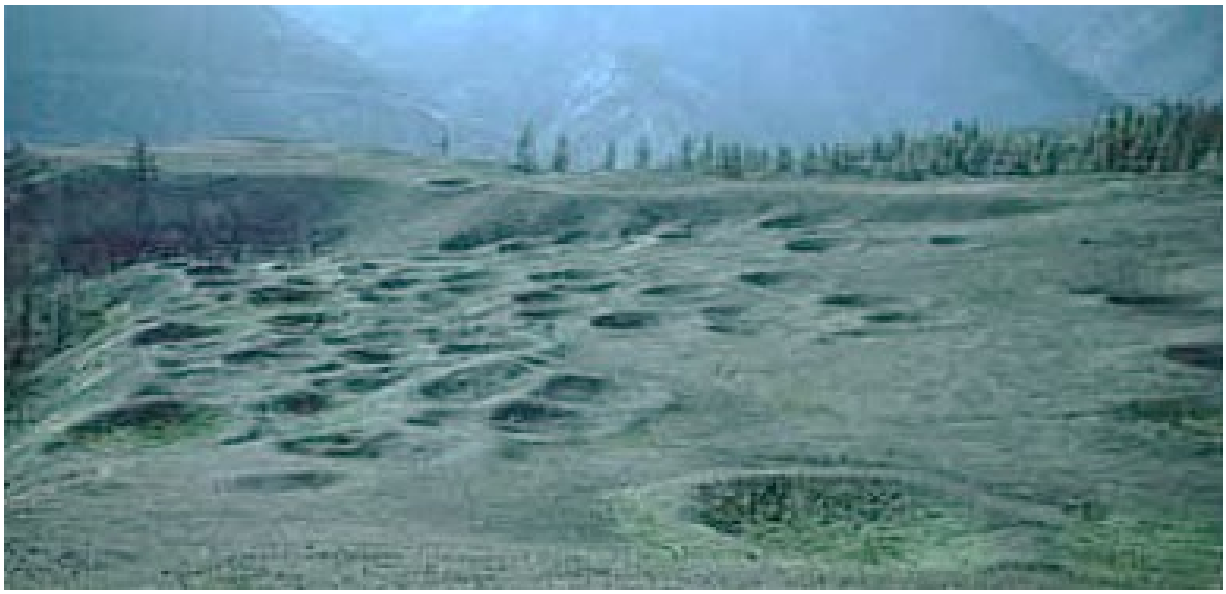


Photo Credit: SFU Museum, Winter pit house village, Lilloeet.

Rock Shelters and Caves

Rock shelters were used, among other purposes, as camps, spiritual or burial locations, and storage caches. Shelters can be found associated with overhangs of large boulders, indentations in rock bluffs or in caves. Shelters often associate with artifacts, rock art, and hearth features.

Ancestral (Human) Remains

Human remains are especially sensitive and significant finds. Any potential human bone requires immediate implementation of the CFP. Ancestral remains are frequently present at archaeological locations and may be found articulated in a burial context or as scattered fragments.

Petroglyphs and Pictographs (Rock Art)

Northwest Coast rock art includes images depicted on boulders, rock overhangs, rock faces, or other exposed rock surfaces. Pictographs are drawings or designs painted on rock using pigments like ochre or charcoal mixed with grease. Petroglyphs are images incised or pecked into stone. Designs vary widely and often depict animals, humans, or an extensive variety of geometric shapes.

Photo Credit: B&OA, Portion of petroglyph panel at Petroglyph Provincial Park, Nanaimo.

Photo Credit: B&OA, Portion of pictograph panel at Pitt Lake.

Fish Weirs and Traps

Fish weirs are structures constructed to funnel and trap fish for harvesting. Traps were built in intertidal areas along marine and river shorelines and near stream mouths. Weirs vary in form and structure depending on water and shoreline conditions, fish species targeted for harvest, intended volume of harvest, and community preferences. Fish weir sites are identifiable by linear or patterned arrangements of wooden stakes protruding from beach or bank edges or boulder alignments along waterways.

Photo Credit: Washington State Archives, Yelm Jim Fish Trap 1885 (http://www.digitalarchives.wa.gov/Record/View/DAA73FC7A57E989D65B6DBEA419FC89E)

Wet Sites

Wet sites are special preservation environments that form in low oxygen water saturated environments along waterways, in bogs and on floodplains. These locations permit enhanced preservation of organic artifacts like wood, bark, and botanicals. Artifacts found in wet sites have included basketry, twine and rope, wooden tools and weapons, architectural structures, and ceremonial implements made of wood and bone.

Photo Credit (left): Mike Blake. Ground slate knife with wooden handle, Agassiz. Photo Credit (right): Katherine Bernick, Waterlogged and preserved basket, Coquitlam.

Culturally Modified Trees (CMTs)

Culturally Modified Trees are trees that have been utilized by Indigenous Peoples for a broad range of cultural uses. Wood was used to build houses, canoes, tools, and weapons. Branches, boughs, and leaves were used to fashion tools, for medicine and in cultural ceremony. Harvesting cedar bark and roots was undertaken regularly to make clothing, cordage, basketry, and sleeping mats, ceremonial regalia, and much more.

Triangular bark stripped cedars are the most common form of CMT; a long, linear triangular bark scar will show where bark was removed from the trunk of a living tree. The exposed scar will heal over time creating a seam on the outer tree bark. This form of sustainable harvesting allowed the same tree to be used multiple times for bark harvesting. CMTs can also show evidence of wood removal where wedges were used to pry rectangular planks of wood from standing, living trees.

Logging and clearing throughout much of Coquitlam municipality reduces the chance that archaeological CMTs remain in most forested areas today, but more recent CMTs where bark or wood was harvested from second-growth forest by Kwikwetlem for cultural uses may be present.

Photo Credit: B&OA, Bark stripped cedars, Coquitlam.

Additional Resources

Learning Portal, Royal BC Museum - https://learning.royalbcmuseum.bc.ca

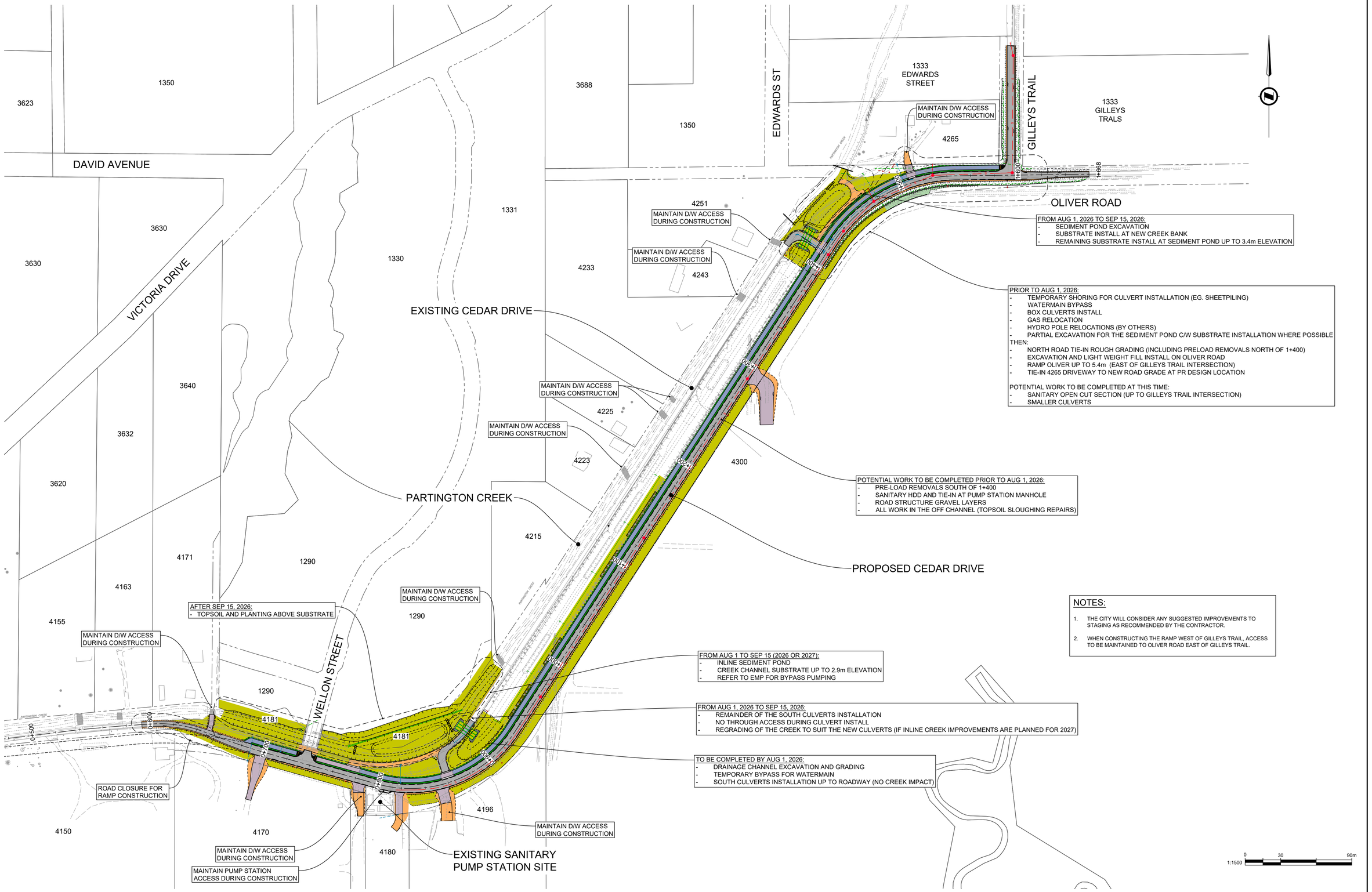
SFU Museum of Archaeology & Ethnology - https://www.sfu.ca/archaeology/museum.html

References Cited

Archaeology Branch (1999). Found Human Remains. On file with the Archaeology Branch, Victoria, BC. 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

Appendix C – Traffic and Construction Staging Plan



PLOT DATE: December 10, 2025

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	APPR'D
A	ISSUED FOR TENDER	2025/12/16	GA	CJB

Coquitlam

TRAFFIC AND CONSTRUCTION STAGING PLAN

CEDAR DR UPGRADES - PHASE 2

PROFESSIONAL ENGINEER G. DE SOUZA ATAIDE # 60849 BRITISH COLUMBIA 2025-12-16

ISL
#201, 3999 Henning Drive, Burnaby, B.C. V5C 6P9
T: (604)629-2696 F: (604)629-2698

IFT DESIGN NO. 33527

SCALE	AS SHOWN	CREATION DATE	2023/07/06
DRAWN BY	GA	DESIGN BY	CJB
CHECKED BY	CJB	APPROVED BY	CJB

DWG. NO. 48 OF 48

REV. A

File: C:\ADSKACCDocs\ISL\32628_COQ_CedarDrive-Phase1Roadworks\Project Files\02_CADD\20_Drafting\203_Sheets\Phase 1 and 2 - Cedar Drive Upgrades\32628_SH_Phase_2_Traffic_Staging.dwg

Appendix D – Additional Information

Additional Information Download links

Instructions: Copy and paste the links into browser to download files.

Knotweed Management Plan (File Size 928kB):

https://qfile.coquitlam.ca/download/82A478A3-27B3-406B-BCDF-E552E272B048/81832%20-%20Phase%202%20-%20Cedar%20Drive%20Upgrades%20-%20Knotweed%20Management%20Plan.pdf

Environmental Plan & Change Approval (File Size 3.3MB):

https://qfile.coquitlam.ca/download.aspx?filetoken=12542BC4-8D7A-4002-829D-F0C8FF776600&name=81832%20-%20Phase%202%20-%20Cedar%20Drive%20Upgrades%20-%20Environmental%20Plan%20&%20Change%20Approval.PDF

As-Built References (File Size 10.3MB):

https://qfile.coquitlam.ca/download/A97CDEE8-1B2B-4A37-8FCE-CE8A9D9C5AC0/81832%20-%20Phase%202%20-%20Cedar%20Drive%20Upgrades%20-%20As-Builts.pdf

Standard Detail Drawings (File Size 876kB):

https://qfile.coquitlam.ca/download/1D3BB7B1-73CC-4941-860C-21F3D4CBC5CF/81832%20-%20Phase%202%20-%20Cedar%20Drive%20Upgrades%20-%20Standard%20Detail%20Drawings.pdf