Coquitlam

City of Coquitlam

Contract Documents
60245-2

Lower Burke Village Roads – Phase 2

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Contract No. 60245-2

Lower Burke Village Roads – Phase 2

Project Construction Documents

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

1. **Standard Documents – supplied** **Page**

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 Tenderers

INVITATION TO TENDER

DATE OF ISSUE: **February 1, 2023**

Tender No. 60245-2

Lower Burke Village Roads – Phase 2

The City of Coquitlam invites tenders for **Contract 60245-2 – Lower Burke Village Roads – Phase 2,** generally consisting of the following, but not limited to:

> Construction of approximately 305 metres of a Higher Density Local Road (Dollar Crescent) including Concrete Curb & Gutter, Concrete Sidewalks, Asphalt Paving, Watermain and Service Connections, Storm and Sanitary Mains and Service Connections, Catch Basins, Lawn Basins, LID's, Street Trees, Landscaping, Pavement Markings, Street Lighting, BC Hydro/Telus/Shaw Underground Ducting 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
Wednesday, February 22, 2023
("Closing Date and Time*)

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.)

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

Inquires

All inquiries are to be submitted in writing by email, no later than 3 full business days prior to Tender Closing Time quoting the Tender Name and Number sent to:

Email: bid@coquitlam.ca

Addenda

Tenderers are required to check the City's website for any updated information and Addenda issued before the Closing Date at: www.coquitlam.ca/BidOpportunities

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 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
Purchasing Manager

Instructions to Tenderers

Tender 60245-2

Lower Burke Village Roads – Phase 2

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: **Lower Burke Village Roads – Phase 2**

Reference No. **60245-2**

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:

- Construction of approximately 305 metres of a Higher Density Local Road (Dollar Crescent) including Concrete Curb & Gutter, Concrete Sidewalks, Asphalt Paving, Watermain and Service Connections, Storm and Sanitary Mains and Service Connections, Catch Basins, Lawn Basins, LID's, Street Trees, Landscaping, Pavement Markings, Street Lighting, BC Hydro/Telus/Shaw Underground Ducting 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**

All inquiries will be received a minimum of 3 full business days prior to Tender Closing Time.

Inquiries received after that time may not receive a response.

2.0 Tender Documents

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

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

2.3 Any additional information made available to Tenderers prior to the Tender Closing Time by the Owner or representative of the Owner, such as geotechnical reports or as-built plans, which is not expressly included

in Schedule 1 or Schedule 2 to the Agreement, is not included in the Contract Documents. Such additional information is made available only for the assistance of Tenderers who must make their own judgments about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the Owner nor any representative of the Owner gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

3.0 Submission of Tenders

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

Tenders must be received on or before:

Tender Closing Time: **2:00 p.m. local time**
Tender Closing Date: **February 22, 2023**

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 or Fax 604-927-3035.

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 received by fax (604-927-3035) or email: bid@coquitlam.ca.

BIDS RECEIVED IN-PERSON OR BY COURIER 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

Additional Instructions to Tenderers

Obtaining Documents

4.1 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

- City of Coquitlam Supplementary Specifications and Detailed Drawings to the MMCD 2009 Edition.

  City of Coquitlam Engineering & Public Works Department
  3000 Guildford Way
  Coquitlam, B.C. V3B 7N2
  Tel: 604-927-3500
  Fax: 604-927-3525

  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

4.2 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

4.3 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

4.4 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

4.5 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

4.6 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

4.7 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

4.8 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

4.9 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

4.10 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

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 or fax, 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___."

12.5 If a tender amendment or revocation is sent by fax, the tenderer assumes the entire risk that equipment and staff at the office referred to in paragraph 3.4 of the Instructions to Tenderers will properly receive the fax containing the amendment or revocation before the *Tender Closing Date and Time*. The *Owner* assumes no risk or responsibility whatsoever that any fax will be received as required by paragraph 12.1 of these Instructions to Tenderers, and shall not be liable to any tenderer if for any reason a fax is not properly received.

13.0 Duration of Tenders

13.1 After the *Tender Closing Time*, a tender shall remain valid and revocable 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 IT5.3 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 he 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.

15.4 Upon receiving notification of being the successful Tenderer, the Tenderer shall submit a Pandemic Prevention Policy and Procedures (4P) document detailing occupational health and safety policies to prevent the spread of Covid-19 to the public, the Tenderer's employees, and sub-contractors during construction operations. The Owner reserves the right to require additions or changes to the 4P document prior to the execution of the Contract. After the Contract is in place, the Contractor will be expected to enforce the 4P document to the satisfaction of the Contract Administrator. If the Contract Administrator deems the 4P document is not being satisfactorily followed, the Contract Administrator may stop work at the sole expense of the Contractor until the Contractor's employees and sub-contractors have been provided proper training and orientation in regard to the 4P document.

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. 60245-2

Lower Burke Village Roads – Phase 2

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, February 22, 2023

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
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Tenderers are responsible to allow ample time to complete the Tender submission process. If assistance is required, phone 604-927-3037 or fax 604-927-3035.

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

February 2023

(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: **Lower Burke Village Roads – Phase 2**
Reference No. **60245-2**

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 **September 29, 2023**; 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: _____ - _____ - _____

Fax: _____ - _____ - _____

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
Lower Burke Village Roads - Phase 2
Contract: 60245-2
SCHEDULE OF QUANTITIES AND PRICES

(see paragraph 5.3.1 of the Instruction to Tenderers)

(All prices and quotations including the Contract Prices shall Exclude GST)

Should there be any disprepancy in the information provided or submitted, the City's original file copy shall prevail

ITEM No.	MMCD Ref. (Supp. Spec.)	DESCRIPTION	UNIT	QTY	UNIT PRICE	EXTENDED AMOUNT
1.00	**01 57 01**	**ENVIRONMENTAL PROTECTION**				
1.01	(1.6.1)	Erosion and Sediment Control (ESC)	ALLOWANCE			$100,000.00
2.00	**01 58 01**	**PROJECT IDENTIFICATION**				
2.01	(1.3.1)	1.2m x 1.2m Static Construction Zone Information Sign	EACH	4		
3.00	**03 20 20**	**CONCRETE WALKS CURBS AND GUTTERS**				
3.01	(1.4.3)	Concrete Curb & Gutter - Wide Base – MMCD C5	L. M.	610		
3.02	(1.4.5)	Concrete Sidewalk - 100mm thick – Broom Finish	SQ. M.	1,160		
3.03	(1.4.6)	Concrete Driveway Corssing - 190mm thick	SQ. M.	30		
4.00	**26 56 01**	**ROADWAY LIGHTING**				
4.01	1.9	Street Lighting (ALL) Works	L. S.	1		
5.00	**31 11 01**	**CLEARING AND GRUBBING**				
5.01	(1.4.2)	Clearing & Grubbing	L.S.	1		
6.00	**31 23 17**	**ROCK REMOVAL**				
6.01	1.6	Rock Removals (Provisional Item)	C. M.	100		
7.00	**31 24 13**	**ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION**				
7.01	(1.8.5)	Common Excavation - Off Site Disposal, includes Stripping & Top Soil Removal (Provisional Item)	C. M.	210		
7.02	(1.8.5)	Common Excavation – On Site Re-use (Provisional Item)	C. M.	820		
7.03	(1.8.7)	Imported (75mm minus Pit Run Gravel) Embankment/Subgrade Fill - (Provisional Item)	TONNE	505		
8.00	**32 11 16.1**	**GRANULAR SUBBASE**				
8.01	(1.4.1)	Granular Subbase Gravel	TONNE	1,560		
9.00	**32 11 23**	**GRANULAR BASE**				
9.01	(1.4.1)	Granular Base - 19mm Minus Gravel	TONNE	1,060		
10.00	**32 12 16**	**HOT-MIX ASPHALT CONCRETE PAVING**				
10.01	(1.5.1)	Lower Course #1 (50mm Lift)	TONNE	355		
11.00	**32 17 23**	**PAINTED PAVEMENT MARKINGS**				
11.01	(1.5.4.1)	Supply & Install Sign Structure - 37 kg Trapezoidal Sign Base, Pole & Cap as per COQUITLAM DRAWINGS # SS-E11.1 & SS-E11.2	EACH	10		
11.02	(1.5.4.3)	Installation of each City Supplied Traffic Sign installed on a Sign Pole using a Sign Mount Clamp	EACH	12		
12.00	**32 91 21**	**TOP SOIL AND FINISH GRADING**				
12.01	(1.4.1)	Top Soil - 150mm thick for Sod	C. M.	210		
12.02	(1.4.1)	Growing Medium	C. M.	520		
13.00	**32 92 19**	**HYDRAULIC SEEDING**				
13.01	(1.6.2)	Hydro Seeding - Flex-Terra FGM (4,500 kg/m2), as per Manufacture's Specifications for ESC & Slope Stability/Protection (Provisional Item)	SQ. M.	3,750		
14.00	**32 92 23**	**SODDING**				
14.01	(1.8.1)	Nursery Sod	SQ. M.	1,370		
15.00	**32 93 01**	**PLANTING OF TREES, SHRUBS AND GROUND COVER**				
15.01	(1.9.1)	Tree Planting - European Beech	EACH	5		
15.02	(1.9.1)	Tree Planting - Maidenhair Tree	EACH	6		
15.03	(1.9.1)	Tree Planting - Black Gum	EACH	8		
15.04	(1.9.1)	Tree Planting - Chinese Elm	EACH	16		
15.05	(1.9.1)	Tree Planting - Japanese Zelkova	EACH	17		
15.06	(1.9.3)	400mm Root Barrier- 3m each side of trees (Optional Item)	L. M.	312		
16.00	**33 11 01**	**WATERWORKS**				
16.01	(1.8.2)	100mm DI (Ductile Iron) - CL 50 Watermain Service Pipe - Road A	L. M.	8		
16.02	(1.8.2)	200mm DI (Ductile Iron) - CL 50 Watermain Service Pipe - Road A	L. M.	46		
16.03	(1.8.2)	200mm DI (Ductile Iron) - CL 50 Watermain Pipe	L. M.	292		
16.04	(1.8.2.1)	Mitchell Street - CL 50 Watermain Service Pipe, Tee, Gate Valves, Tie In & Permanent Restoration - As Shown on Drawing 19 of 27	L.S.	1		
16.05	(1.8.3)	200 x 200 x 100 DI Tee	EACH	1		
16.06	(1.8.3)	200 x 200 x 150 DI Tee	EACH	2		

ITEM No.	MMCD Ref. (Supp. Spec.)	DESCRIPTION	UNIT	QTY	UNIT PRICE	EXTENDED AMOUNT
16.07	(1.8.3)	200 x 200 x 200 DI Tee	EACH	2		
16.08	(1.8.3)	200 x 200 x 200 x 200 DI Cross	EACH	1		
16.09	(1.8.3)	100mm DI Gate Valve	EACH	1		
16.10	(1.8.3)	200mm DI Gate Valve	EACH	9		
16.11	1.8.9	Supply and Install Watermain Anchor Blocks (MMCD Standard Detail Drawing G8)	EACH	10		
16.12	(1.8.15)	Fire Hydrant Assembly	EACH	2		
16.13	(1.8.13)	200mm dia Watermain Tie-in	EACH	2		
17.00	**33 30 01**	**SANITARY SEWERS**				
17.01	(1.6.2)	200mm dia DR35 PVC - Sanitary Service Pipe	L. M.	38		
17.02	(1.6.2)	200mm dia DR35 PVC - Sanitary Main Pipe	L. M.	240		
17.03	(1.6.2.1)	Mitchell Street - 200mm dia DR35 PVC - Sanitary Service Pipe - Fittings, Inspection Chamber, Tie in and all Permanent Restoration As shown on Drawing 21 of 27	L.S.	1		
17.04	1.6.4	Inspection Chamber as per MMCD STD DWG S9	EACH	3		
18.00	**33 40 01**	**STORM SEWERS**				
18.01	(1.6.2)	100 PVC DR28 Storm Discharge Pipe	L. M.	70		
18.02	(1.6.2)	450 PVC DR35 Storm Main Pipe	L. M.	61		
18.03	(1.6.2)	600 CONC. C-76 III Storm Main Pipe	L. M.	196		
18.04	(1.6.2)	750 CONC. C-76 III Storm Main Pipe	L. M.	43		
18.05	(1.6.2)	375 PVC DR35 Storm Service Pipe	L. M.	40		
18.06	(1.6.2.1)	Mitchell Street - 375mm dia DR35 PVC - Storm Service Pipe - Fittings, Inspection Chamber, Tie in and all Permanent Restoration As shown on Drawing 20 of 27	L.S.	1		
18.07	1.6.4	Inspection Chamber as per MMCD STD DWG S10	EACH	3		
18.08	(1.6.5)	Catch Basin or Lawn Basin Lead - 150mm dia DR28 PVC Pipe	L. M.	96		
18.09	(1.6.5)	Catch Basin or Lawn Basin Lead - 200mm dia DR35 PVC Pipe	L. M.	44		
18.10	(1.6.6)	Trench Dam - As Shown on Drawing 03 of 27 c/w Filter Fabric, Pipe, Connection to Manhole, Concrete Dam Sacks, Drain Rock and Fittings	EACH	3		
18.11	(1.6.6)	Trench Dam and Decant - COQ-SW3 & COQ-SW4 c/w Filter Fabric, Pipe, Tees, Connection to L.B, Concrete Dam Sacks, Drain Rock and Fittings	EACH	9		
18.12	(1.6.6)	Dispersal Trench - COQ-SW3 (Low Side) c/w Filter Fabric, 12 metre Dispersal Pipe, Tees, Connection to C.B, Concrete Dam Sacks, Cleanout, Drain Rock, Filter Fabric and Fittings	L.M.	130		
18.13	(1.6.6)	Back of Curb - Shallow Drain (COQ-SW3 and COQ-SW4) (Provisional)	L.M.	90		
18.14	1.6.9	Tie-in to Existing 450mm Concrete Main at BVP (includes all necessary pipe removals, spool pieces and fittings)	L.S.	1		
19.00	**33 44 01**	**MANHOLES, CATCHBASINS, AND LAWNBASINS**				
19.01	(1.5.1.1)	1050mm Sanitary Manhole (c/w Base, Benching, Lid, Slab, Cover & Frame)	EACH	7		
19.02	(1.5.1.1)	1050mm Storm Manhole (c/w Base, Benching, Lid, Slab, Cover & Frame)	EACH	1		
19.03	(1.5.1.1)	1200mm Storm Manhole (c/w Base, Benching, Lid, Slab, Cover & Frame)	EACH	4		
19.04	(1.5.1.1)	North Splitter Manhole (DMH 1.9) - 1200mm Storm Manhole (c/w Base, Pipe, Fittings, Lid, Slab, Cover & Frame) As Shown on Drawing 11 of 27	L.S.	1		
19.05	(1.5.1.1)	1350mm Storm Manhole (c/w Base, Benching, Lid, Slab, Cover & Frame)	EACH	2		
19.06	(1.5.1.1)	Flow Control Manhole (DMH5.1) - 2400mm x 1500mm Concrete Box Manhole (c/w Base, Benching, Sluice Gate, Lid, Slab, Cover & Frame) As Shown on Drawing 13 of 27	L.S.	1		
19.07	(1.5.1.2)	1050mm Sanitary Manhole Riser Sections	Vert. M.	14		
19.08	(1.5.1.2)	1050mm Storm Manhole Riser Sections	Vert. M.	4		
19.09	(1.5.1.2)	1200mm Storm Manhole Riser Sections	Vert. M.	11		
19.10	(1.5.1.2)	1350mm Storm Manhole Riser Sections	Vert. M.	6		
19.11	(1.5.2)	Catch Basin - COQ-S11A c/w Dobney Foundry Ltd. - B-39M Frame/Grate	EACH	11		
19.12	(1.5.2)	Lawn Basin - MMCD S12 Type 2	EACH	18		
19.13	(1.5.2)	Cleanout (MMCD S6)	EACH	1		
20.00	**35 00 01**	**BC HYDRO, SHAW, TELUS, and FORTIS UTILITY WORK**				
20.01	(1.1)	BC Hydro Civil (ALL) Works	L.S.	1		
20.02	(1.1)	Telus Civil (ALL) Works	L. S.	1		
20.03	(1.1)	Shaw Cable Civil (ALL) Works	L. S.	1		
Name of Contractor _____					**TOTAL (Exclude GST)**	

APPENDIX 2

FORM OF TENDER

Contract 60245-2
Lower Burke Village Roads – Phase 2

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

INDICATE SCHEDULE WITH BAR CHART WITH CONSTRUCTION DURATIONS

CONSTURCTION ACTIVITY	MARCH		APRIL				MAY				JUNE					JULY				AUGUST					SEPTEMBER			
	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	5	1	2	3	4

Substantial Completion Date: **September 29, 2023**

Proposed Disposal Site: _____

APPENDIX 3

FORM OF TENDER

Contract 60245-2
Lower Burke Village Roads – Phase 2

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 N0:**	

PROJECT:		**Dates:**	
Work Description:			
Responsibility:			
Owner/Reference:		**Phone N0:**	

PROJECT:		**Dates:**	
Work Description:			
Responsibility:			
Owner/Reference:		**Phone N0:**	

APPENDIX 4

FORM OF TENDER

Contract 60245-2
Lower Burke Village Roads – Phase 2

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

PROJECT:		**VALUE ($):**	
OWNER:		**Phone Number:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone Number:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone Number:**	
Work Description:			

PROJECT:		**VALUE ($):**	
OWNER:		**Phone Number:**	
Work Description:			

APPENDIX 5

FORM OF TENDER

Contract 60245-2
Lower Burke Village Roads – Phase 2

<u>SUBCONTRACTORS</u>
(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 60245-2
Lower Burke Village Roads – Phase 2

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 _____, 2023, 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 _____, 2023.

SIGNED, SEALED AND DELIVERED
In the presence of:

)
)
)
)
_____)

_____
PRINCIPAL

_____
SURETY

APPENDIX 7

FORM OF TENDER

Contract 60245-2
Lower Burke Village Roads – Phase 2

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: **60245-2**

Contract Name: **Lower Burke Village Roads – Phase 2**

***Description of Work**:*

Construction of approximately 305 metres of a Higher Density Local Road (Dollar Crescent) including Concrete Curb & Gutter, Concrete Sidewalks, Asphalt Paving, Watermain and Service Connections, Storm and Sanitary Mains and Service Connections, Catch Basins, Lawn Basins, LID's, Street Trees, Landscaping, Pavement Markings, Street Lighting, BC Hydro/Telus/Shaw Underground Ducting 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 _____ 2023.

Contract: **Lower Burke Village Roads – Phase 2**

Reference No. **60245-2**

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 **September 29, 2023** 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, by hand or by fax, 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
Fax: 604-927-3505

The *Contracto*r:

Tel:
Fax:
Email:
Attention:

The *Contract Administrator*:

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

Tel:
Fax:
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 fax; 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*.

6.4 The sender of a notice by email or fax assumes all risk that the fax will be received properly, and the provisions of paragraph 12.5 of the Instructions to Tenderers Part II apply to the sender.

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

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

_____
(MANAGER, DESIGN AND CONSTRUCTION)

Lower Burke Village Roads – Phase 2

Reference No: 60245-2

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 Drawing, 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

Lower Burke Village Roads – Phase 2

Reference No: 60245-2

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 Plan
Appendix B: Construction Environmental Management Plan
Appendix C: BC Hydro, Telus & Shaw Drawings
Appendix D: BC Hydro, Telus & Shaw Manhole Specifications

Bound Separately: Contract Drawings

TITLE	DRAWING No.	REVISION No.	DATE
COVER	00	-	
GENERAL NOTES	01	C	2023/01/20
KEY PLAN	02	A	2023/01/20
TYPICAL SECTIONS	03	C	2023/01/20
ROADS + WATER – ROAD A - STA 1+000 TO 1+140	04	C	2023/01/20
ROADS + WATER – ROAD A - STA 1+140 TO 1+300	05	C	2023/01/20
ROADS + WATER – ROAD A - STA 1+300 TO 1+435	06	C	2023/01/20
ROADS + WATER – POND ACCESS ROAD	07	E	2023/01/20
ROADS WORKS – ROAD A – SIGNAGE AND APVEMENT MARKINGS	08	C	2023/01/20
STORM SEWER – LID PLAN – LOWER BURKE VILLAGE ROADS – PHASE 2	09	C	2023/01/20
STORM SEWER – ROAD A – STA 1+100 TO 1+220	10	C	2023/01/20
STORM SEWER – ROAD A – STA 1+220 TO 1+420	11	C	2023/01/20
STORM SEWER – WATER QUALITY PONE – PLAN AND PROFILE	12	C	2023/01/20
STORM SEWER – WATER QUALITY POND – DETAILS	13	C	2023/01/20
SANITARY SEWER – ROAD A – STA 1+100 TO 1+220	14	C	2023/01/20
SANITARY SEWER – ROAD A – STA 1+220 TO 1+420	15	C	2023/01/20
LANDSCAPE – ROAD A – STA 1+100 TO 1+140	16	C	2023/01/20
LANDSCAPE – ROAD A – STA 1+140 TO 1+435	17	C	2023/01/20
LANDSCAPE – QUALITY CONTROL POND – PLANTING PLAN	18	B	2023/01/20
WATER WORKS – WATER SERVICE – MITCHELL STREET – LOT 1	19	A	2023/01/20
STORM SEWER – STORM SERVICE – MITCHELL STREET – LOT 1	20	A	2023/01/20
SANITARY SERVICE – SANITARY SERVICE – LOT 1	21	A	2023/01/20
SECTIONS – ROAD A – STA 1+030 TO 1+140	22	C	2023/01/20
SECTIONS – ROAD A – STA 1+150 TO 1+260	23	C	2023/01/20
SECTIONS – ROAD A – STA 1+270 TO 1+390	24	C	2023/01/20

TITLE	DRAWING No.	REVISION No.	DATE
STREET LIGHTING – DOLLAR CRESCENT AND ROSENBURG WAY (PHASE 2)	25	-	2023/01/30
STREET LIGHTING – DOLLAR CRESCENT AND ROSENBURG WAY (PHASE 2)	26	-	2023/01/30
STREET LIGHTING – DOLLAR CRESCENT AND ROSENBURG WAY (PHASE 2)	27	-	2023/01/30

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 4.1.2 ***(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 the 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.

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.

18.0 PAYMENT

18.1 Preparation of Payment Certificate

18.1.1 ***(Replace clause 18.1.1 as follows):***
The Contract Administrator shall prepare and issue a certificate for the period ending the last calendar day of the month.

18.4 Holdbacks

18.4.2 ***(Add to clause 18.4.2 as follows):***
At the sole discretion of the Contract Administrator, an amount equivalent to 10% of the contract award value or 200% of a reasonable estimate, whichever is higher, may be held without interest until all deficiencies have been remedied and accepted by the Contract Administrator.

18.6 Substantial Performance

18.6.5 ***(Replace clause 18.6.5 as follows):***
The Owner may release any builders lien holdback on the 56th day following the date of Substantial Performance, or other date as required by law, but the Owner may hold back the amounts for any deficiencies or filed builders liens as provided in GC 18.4.2, 18.4.3 and 18.4.4.

18.6.6 ***(Replace clause 18.6.6 as follows):***
The *Contract Administrator*, as defined herein, shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of the *Contractor*, but not the *Work* of *Subcontractors*. The *Contractor* shall cooperate with and assist the *Contract Administrator* by providing information and assistance in a timely manner as the *Contract Administrator* considers necessary to carry out the duties of the *Payment Certifier* for the *Contract*.

The *Contractor* shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of each *Subcontractor*. Prior to certifying completion for a *Subcontractor*, the *Contractor* shall consult the *Contract Administrator* and obtain the *Contract Administrator's* comments on the status of completion by the *Subcontractor*, including any deficiencies or defects in the *Subcontractor's Work* noted by the *Contract Administrator*. The *Contractor* will indemnify and save the *Owner* harmless from any and all liability the *Owner* may have to anyone arising out of the certification by the *Contractor* of *Substantial Performance* for that *Subcontractor*.

Notwithstanding any other provision of the *Contract*, no payments will be due or owing to the *Contractor* so long as a Lien filed by anyone claiming under or through the *Contractor* remains registered against the Project of any lands, or interest therein, on which *Work* for the project was performed. Failure of the *Contractor* to remove all Liens promptly will entitle the *Owner* to damages.

21.0 WORKERS COMPENSATION REGULATIONS

21.2 Contractor is "Prime Contractor"

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

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

24.1 General

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

24.1.2 **Acceptable Insurance Carriers:**
The insurer issuing any policy, or other document which is evidence of insurance to the Contractor, shall be an insurer licensed by the Superintendent of Insurance in the Province of British Columbia and registered with the Department of Insurance for Canada in Ottawa, except the Insurance Corporation of British Columbia, which is not subject to this condition.

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

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

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

24.2 Required Insurance

24.2.1 **General**

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

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

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

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

24.2.2 **Public Liability Insurance:**

(Other than Automobile Third Party Liability Insurance):

Evidence of Insurance:

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

Effective Dates and Terms:

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

Limits of Liability:

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

24.2.3 **Public Liability Insurance (Automobile):**

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

24.3 Physical Loss or Damage With Respect to New Buildings under 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
D.7	( )	( )	**PROFESSIONAL LIABILITY INSURANCE for Consultant Service Agreements**

The *Consultant* shall obtain and maintain for the duration of the *Services* as described in the Agreement, at its own cost, Professional Liability Insurance on terms and from an insurer satisfactory to the City of Coquitlam.

The Professional Liability Insurance policy shall insure the *Consultant's* legal liability for errors, omissions and negligent acts, to the extent of no less than $500,000.00 per Claim and $1,000,000.00 Aggregate.

Authorized Signature and Stamp

Date

Name and Title

City' broker to return to City Representative

Department

APPENDIX IV

PRIME CONTRACTOR DESIGNATION

Subject: **Prime Contractor Designation**
Contract #: **60245-2**
Contract Name: **Lower Burke Village Roads – Phase 2** (the "Project")

_____ (the "Contractor") represents, acknowledges and agrees that:

1. in accordance with section 118 of the Workers Compensation Act, R.S.B.C. 1996, c. 492 (the "Workers Compensation Act"), the Contractor shall be the "Prime Contractor" and is qualified to act as the "Prime Contractor" in respect of the Project;
2. the Contractor accepts the duties and responsibilities for coordination of health and safety in accordance with the Workers Compensation Act and further agrees that it will do everything necessary to establish and maintain a system or process that will insure compliance with the Workers Compensation Act and the Regulations thereto;
3. the Contractor shall fulfill all the obligations of an "Owner" under section 119 of the Workers Compensation Act in respect of the Project site; and
4. that the City of Coquitlam has fulfilled its obligations as an "Owner" under section 119 of the Workers Compensation Act, in respect of the Project site.

Prime Contractor Name & Address:

_____

_____

_____ _____
Prime Contractor Signature Date

_____
Print Name

Please return a signed copy of this memo to the City of Coquitlam. If you have any questions, please contact the City's Health and Safety Advisor at 604-927-3068.

Supplementary Contract Specifications

SUPPLEMENTARY CONTRACT SPECIFICATIONS INDEX ..... SS 1

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. As set out in the MMCD the Contractor must provide updates to the construction schedule monthly.

1.02 Survey Layout

Construction layout will be staked out by the Contract Administrator.

1.03 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 paid by the contractor.

1.04 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.

1.05 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.

1.06 Work by Others

The Contractor will be required to accommodate the following Contractors/utility companies in their scheduling and sequencing of work:

1. BC Hydro – underground cable installation and other works
2. Telus – underground cable installation and other works
3. Shaw Cable - underground cable installation and other works
4. Fortis BC –gas main(s) installation and other works

1.07 Location of Existing Utiltities

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 Metro Vancouver for location of their utilities and BC One for location of other outside agency utilities. The contractor will not receive any compensation or allowance for delays if work is halted due to utilities & services connections not located prior to commencing construction.

City of Coquitlam does not guarantee water, storm or sanitary services connections are perpendicular to the mains or property lines, the contractor will not receive any compensation for the time to locate these connections or for exposing hidden services at the property lines.

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

1.08 Approved Products

A list of products that have been approved for use within the City of Coquitlam can be found on the City's website (www.coquitlam.ca).

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 Completion, the City may again video inspect the lines to ensure no problems exist due to construction activities under this contract. If problems are encountered, the Contractor will be responsible for the cost of the video and all costs associated with the cleaning of the pipe.

2.02 Site Clean-up During Construction and End of Construction

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

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

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

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.

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.

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 reports. Record documents to include changes in the Issued for Construction Drawings, new elevation & location of all walkways/sidewalks, all utilities, manhole rim, catchbasin rim, vaults, valve boxes and inverts affected by the work. Legal Holdbacks's will not be released until Record Documents have been submitted and accepted by the Contract Administrator.

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.

1.01 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.

1.02 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.

1.1 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.

1.2 Survey Layout

Construction layout will be staked out by the Contract Administrator.

The Contractor shall, before commencing the work, satisfy himself as to the meaning and correctness of all stakes, marks, grade sheets and other notes.

The Contractor shall be responsible for the preservation of all layout stakes and marks established by the Contract Administrator. Should any layout stakes be disturbed, lost or destroyed after having once been given the Contractor shall at once notify the Contract Administrator in writing, and all expenses incurred by the Contract Administrator in replacing the stakes will be charged against the Contractor or may be deducted from any monies due or that may become due to the Contractor.

If at any time during the progress of the work any error shall appear or arise in the position, levels, dimensions or alignment of any part of the work, the Contractor shall stop work on his portion of the project and notify the Contract Administrator who will within a reasonable time verify the same. If the Contractor proceeds with the work after a discrepancy is discovered, he does so at his own risk. The Contractor shall make allowances in his work schedule for delays of this nature and shall not claim or be paid for related stand-by or shut-down time.

1.3 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.

1.4 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

1.5 Access to Work

Allow inspection testing agencies access to Work.

1.6 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 / 25 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
2.2 Sieve: 1 test / placed material / 250 TONNES

3. Granular Subbase
3.1 Compaction: 1 test/500m^2 / 300mm depth of granular subbase
3.2 Sieve: 1 test / placed material / 250 TONNES

4. Embankment (Subgrade)
4.1 Compaction: 1 test/ 50m^2 / 300mm depth of fill
4.2 Sieve: 1 test / placed material / 100 TONNES

5. Asphalt
5.1 Marshall test: 1 test per 250 TONNES placed, per specified mix, min. 1 / day
ASTM D1559, D3203, C117, C136

5.2 Superpave: 1 test per 250 TONNES placed, min. 1 / day
CAI-SP2, ASTM D3203, C117, C136
5.3 Cores: 1 per 500 m^2/lift
5.4 Continuous asphalt density testing during paving.

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

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

1.7 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

1.0	**GENERAL**	Add 1.0.6	The *Contractor* is responsible for all temporary traffic control on the streets required for completion of the work. The *Contractor* will be responsible to provide a Traffic Management Plan (TMP) for approval (5) five working days prior to any lane closures taking place. TMP is to be prepared by a professional certified by the American Traffic Safety Services Association. 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.
		Add 1.0.7	A Road and Sidewalk Closure Permit is required from Coquitlam for all work affecting pedestrian and traffic flow related to construction. A permit is required for each specific construction interference with pedestrian and traffic flow. The road and sidewalk closure permit form can be obtained for use from the City's website at http://www.coquitlam.ca. The Contractor must follow the approved TMP. Any changes to this TMP must be submitted to City's Traffic Operations for approval.
		Add 1.0.8	Refer to Appendix A – Traffic Management Detail Specifications
1.4	**Traffic Control**	Delete 1.4.1 and replace with the following	The Contractor shall conduct his operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business and residences adjacent to the Place of Work. No greater quantity of work shall be undertaken at any one time than can be properly conducted with due regard to the rights and interests of the public as may be determined by the Contract Administrator. The Contractor is to provide at all times safe and convenient means of approach and entrance to adjoining lanes, driveways, buildings and property both for vehicles and pedestrians to the satisfaction of the Contract Administrator. For this purpose he shall construct and maintain suitable and safe platforms, approaches, structures, bridges, diversions or other works. Where traffic must cross open trenches, the Contractor shall provide suitable bridges. Where trenches have been backfilled or where road improvements are incomplete the Contractor shall take any steps necessary to prevent potholes or other traffic hazards. Where the Contract Administrator so instructs or where Contract Specifications so require, the Contractor shall provide temporary asphalt patching of such hazards.
		Add 1.4.9.3.1	The *Contractor,* as required by the *Contract Administrator* and the City, is to supply Construction Zone information signs (stationary), refer to MMCD 01 58 01 for the required identification signage. The *Contractor* is responsible for the removal of the signs at the completion of the work.
		Delete 1.4.10.1.3 and replace with the following	When workmen or equipment are employed over travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

1.5	**Measurement for Payment**	Delete 1.5.1 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.

END OF SECTION

1.0 GENERAL

1.0.3	**Erosion and Sediment Control Supervisor**	Add 1.03	The Erosion and Sediment Control (ESC) Supervisor is the Qualified Professional who is experienced in implementing ESC Plans and who is responsible for the inspection and monitoring of ESC Facilities to ensure these are installed and maintained in accordance with the ESC Plan, and if necessary, are modified during construction to ensure compliance with the Stream and Drainage System Protection Bylaw No. 4403, 2013.
1.0.4	**Construction Environmental Management Plan**	Add 1.04	See CEMP dated Jan. 2020 in Appedix B of these Supplementary Contract Specifications. The Construction Environmental Management Plan outlines site specific work sequencing requirements and explicit monitoring, inspection, certification and signoff procedures to mitigate the risk of adverse impacts affecting riparian buffer zone integrity, aquatic habitat values, and water quality during completion of thje works. Measures identified in this plan must be strictly adhered to.
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 a Sediment Control Plan under 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.
		Delete 1.2.2.2 and replace with the following	Do not operate construction equipment in 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.

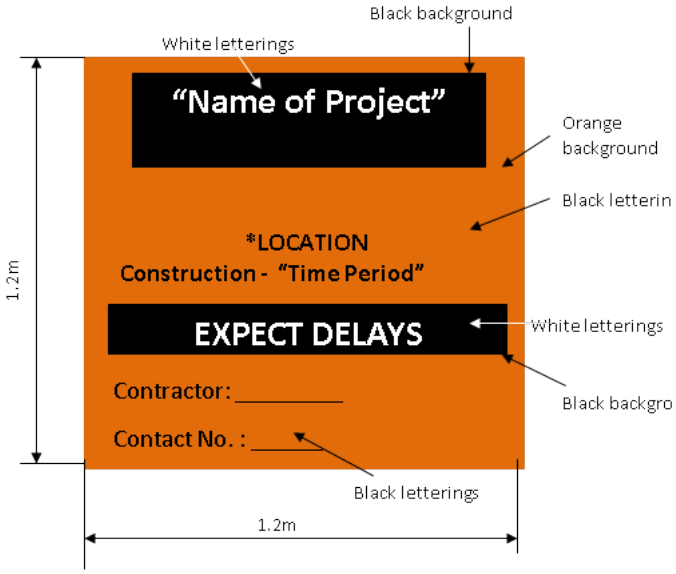
1.4	**Environmental Protection**	Add 1.4.3.5	Immediately contain and clean up any leaks and spills of prohibited materials at the *Place of Work*.
		Add 1.4.3.6	Ensure that a well-stocked spill kit is on-site at all times and that the Contractor's employees are familiar with appropriate spill response techniques. Any spill of reportable quantities must be immediately reported to the Provincial Emergency Program's 24 hour phone line at 1-800-663-3456.
		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 metres of any water course or surface water drainage.
1.6	**Measurement and Payment**	Delete 1.6.1 and replace with the following	Payment by allowance for Erosion and Sediment Control (ESC) will include silt fencing, silt fencing, interceptor channel/swale/ditch construction, interceptor drain pipe, check dams, catchbasin, socks, includes supply of materials to complete the work as shown on the Contract Drawings or as directed by the Contract Administrator. Payment shall be made for the actual cost on a Force Account basis as defined in GC 10.0.
		Add 1.6.2	Payment for this item as directed by the Contractor Administrator includes supply, placement, maintenance, materials, removal and incidentals required for environmental protection.
		Add 1.6.3	Payment for the poly cover or temporary tarps over stock pile materials or exposed road subgrades shall be treated as incidental work.
1.8	**Clean Up**	Add 1.8.2	The work will include cleaning of all catch basins within the work area, or nearby location as affected by the Work, regardless of the condition of the catch basins prior to starting the Work and all manholes and/or sewers affected by work done under this contract. 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.
1.9	**Archaeological / Historical Resources**	Add 1.9	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.

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 notification signs (shown below) includes supply, placement & removal and will be paid for each sign placed as identified on the Schedule of Quantities and Prices and in the Contract Documents.



END OF SECTION

1.0 GENERAL

1.4 Measurement and Payment

Delete 1.4.3 and replace with the following

Payment for machine placed or hand formed C5 wide base concrete curb, excluding granular subbase & base, includes supply and placing of the concrete curb and gutter and will cover all straight and curve sections and will be made separately for each specified type.

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, driveways, walkways, stamp concrete, infills and all concrete ramps, excluding granular base, includes supply and placing of the concrete, 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 granular base will be made under payment items in Section 32 11 23S, Granular Base.

2.0 PRODUCTS

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. <u>All manholes must be vertically adjusted a minimum of twenty-four (24) hours prior to concrete placement.</u>

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**		
1.3	**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.
1.8	**Record Drawings**	Add 1.8.2	Final payment(s) will be withheld until record drawings are received.
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.
		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 clearing and grubbing will include removal and disposal of all branches, stumps, trees, timbers and vegetation to complete the work as shown on the Contract Drawings or as directed by the Contract Administrator.
		Delete 1.4.2 and replace with the following	Payment for clearing and grubbing will be based on the areas shown on the Contract Drawings or as directed by the Contract Administrator.

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, where specied 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

1.0	**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.
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

1.0 GENERAL

1.7	**Seismic Survey and Monitoring**	Delete 1.7.1 and replace with the following	*Contractor* will arrange for assessment of adjacent buildings and structures to determine existing conditions and will provide building and structure owners with proposed blasting procedures and copies of assessment reports and seismic recording operations.
		Delete 1.7.2 and replace with the following	Cost of professional seismic survey and monitoring reports will be paid by *Contractor*.

END OF SECTION

1.8 Measurement and Payment

Delete 1.8.4 and replace with the following

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

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

Delete 1.8.5 and replace with the following

Payment for Common Excavation includes:

1. Unless noted in the Schedule of Quantities and Prices as removal in square meters, common excavation will be measured in cubic metres calculated from measurements taken by the Contract Administrator in the areas of excavation for road widening areas.
2. Cross-sections will be taken after clearing and grubbing and after stripping 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 full truck load volumes. The following is to be used for payment:

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 re-use includes excavation, transport, temporary stockpiling, placement, compaction, boning, adjustment of moisture content, spreading and grading of material anywhere on site or within the work zone, as needed, to establish the roadway & pathway cross-section.

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

		Delete 1.8.7 and replace with the following	Payment for imported embankment/subgrade fill, 75mm minus pit run gravel (in accordance to Clause 2.3 Pit Run Gravel in Section 31 05 17 – Aggregates and Granular Materials), includes compaction, transport, placement, boning, adjustment of moisture content, spreading and grading of material anywhere on site as needed, to establish the cross-section. Measurement will be for actual quantity placed based on weigh tickets provided to Contract Administrator as loads are delivered.
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.
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.
		Delete 1.5.2 and replace with the following	Pavement surface cleaning, as per section 32 01 11, and all other work incidental to the application of tack coat is deemed to be included in the unit price bid for tack coat.
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 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.
		Delete 1.5.3 and replace with the following	Payment for asphaltic concrete sidewalks, pathways, driveways, and infill strips paving includes all construction joint preparation, saw cutting, supply and placing of the asphaltic concrete, compaction and cleaning frames, covers and lids of castings affected. 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.
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 or any other materials not specified in the Contract Documents 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 10 % by mass of RAP for Upper Course Asphalt and 15 % 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 60ºC 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. All manholes must be vertically adjusted a minimum of twenty four (24) hours prior to paving. 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 paint 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 by the Contract Adminstrator, 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 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 THERMPOPLASTIC 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. 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.

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, HITEX North America (HiBrite Extrude Thermoplastic), or ENNIS-FLINT (Extruded Thermoplastic).
		Delete 2.1.6 and replace with the following	Pavement Markings:

Add 2.1.7 Thermoplastic material:

.1 Material composition shall be at the discretion of the manufacturer subject to the approval of the Contract Administrator and the City. Each formulation shall be identified by a code number.

.2 No retained water when tested by ASTM D-570.

.3 Specific gravity of the supplied product shall be within 3 % of that specified for the selected formulation.

.4 Material shall not deteriorate upon contact with deicing chemicals, gasoline, diesel fuel or grease dropped by traffic.

.5 Material shall not break down, deteriorate, scorch or discolour, if held within the application temperature range specified by the manufacturer for a period of four hours and it must be able to be reheated from room temperature to the application temperature four (4) times without showing any of these detrimental effects.

.6 When applied at the temperature recommended by the manufacturer and at a film thickness of 2 to 4 mm, the material shall set solid and show no tracking under traffic after elapsed times as follows:

.1 Two (2) minutes at an air temperature of 10° C, relative humidity less than 75 %, and road surface temperature from 10° C to 20° C.

.2 Five (5) minutes at an air temperature of 32° C, relative humidity less than 75 %, and road surface temperature from 35° C to 50° C.

.3 The drying time under conditions intermediate between the two air temperatures shall be interpolated using a straight line model.

.7 The quantity, type, and gradation of the component reflecting glass spheres premixed in the thermoplastic material shall be at the discretion of the manufacturer, but shall provide retroreflection levels specified below.

3.0 EXECUTION

3.3 Application

Add to 3.3.1.3 Temporary raised pavement markings (TRPMs) are to be provided on all multi-lane roadways as directed by the *Contract Administrator* and the City.

Delete 3.3.3.3 and replace with the following Thermoplastic material shall be heated in the melter to a temperature of 382 °F.

END OF SECTION

1.0 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 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 for growing medium, bark mulch, and top soil will be made separately and includes supply of material, on-site handling, preparing the landscape area subgrade, placing, 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 tones (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 City Representative 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. 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 a 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 Bidner 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 a 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 mire 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.

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 equaled 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 metre 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.
2.0	**PRODUCTS**		
2.1	**Sod**	Delete 2.1.1 and replace with the following	Sod to be approved by the *Contract Adinistrator* 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 that 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 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 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 Adinistrator* 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 metres 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 can not 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 Section 32 93 15S including maintenance to meet Conditions of Total performance.
		Add 1.9.3	Payment for 400mm deep Root Barrier includes supply of all materials and the required labour, and equipment necessary to complete the installations.
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 Identificaton**	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 Perfomance* 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 prressure 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 through out 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 completion.

.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 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 in tact, 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

1.0	**GENERAL**		
1.2	**References**	Delete 1.2.2.1 and replace with the following	National Association of Sewer Service Companies' (NASSCO's) Pipeline Assessment and Certification Program, version 6.x including addendums, or latest version.
1.3	**Submission of Certification**	Delete 1.3.1 and replace with the following	Submit copy of the CCTV operator's current NAASCO certification certificate to the Contract Administrator at least one week prior to the start of the CCTV inspection operations.
2.0	**PRODUCTS**		
2.1	**Equipment**	Delete 2.1.4 and replace with the following	The individual digital video playback files to be of MPEG file format.
		Add 2.1.5	The digital data file delivered to the City to be in PACP standard database file format version 6.x or latest.
3.0	**EXECUTION**		
3.1	**CCTV Inspection**	Delete 3.1.1 and replace with the following	CCTV operator to be certified by NASSCO (PACP/MACP/LACP).
		Delete 3.1.2 and replace with the following	NASSCO certified software must be used to produce inspection report and the data will be submitted in the PACP standardized database format. The review of this statement will be part of the evaluation of the tender. Submission to satisfy all of the specifications and report submissions per NASSCO's PACP (MACP/LACP) will be used as a benchmark for subsequent inspection report submission.
		Delete 3.1.11 and replace with the following	Note condition of pipe joints at manhole walls at the beginning and end of each pipeline; At the beginning of each pipeline or where surface wear of the pipe changes, pan to the invert and any direction as needed to report and record surface wear condition of the pipe using PACP (MACP/LACP) codes; Fill under remarks the observations if no surface wear observed due to good condition of pipe or unable to determine stating reason.
		Delete 3.1.14 and replace with the following	Stop camera at each defect, change of condition of pipe and service connection to record defect in accordance with PACP (MACP/LACP) codes.
		Delete 3.1.15 and replace with the following	Add PACP (MAC/LACP) code overlay to digital video at defects or connections in addition to continuously displayed data.
		Add 3.1.19	The inspection measurement and reporting units must be in metric system.
3.3	**Site Coding Sheets**	Delete 3.3.1 and replace with the following	Each pipeline length to be recorded according to the PACP. Any variation from the manual to be noted in the survey report.
		Delete 3.3.2 and replace with the following	Use standard coding form and standards of PACP:
		Delete 3.3.2.1	

		Delete 3.3.2.2	
		Delete 3.3.2.3 and replace with the following	Note observations as to condition of service connections beyond mainline in remarks column using standards codes as per PACP.
3.7	**Photographs and /or Digital Images**	Delete 3.7.1 and replace with the following	Photograph all major defects as defined by condition codes in PACP: B, CC, CL, CM, TFD, TBD, TSD, TRD, D, FC, FL, FM, H, IR, IG, JO, OB, JS, RM, RB, RT, and X.
		Delete 3.7.2.5 and replace with the following	PACP/MACP/LACP Condition Defect Code.
3.8	**Inspection Reporting Hard Copies & Digital Format**	Delete 3.8.2 and replace with the following	Present machine printed (hardcopy) and computer generated data base reports according to the PACP format.
		Delete 3.8.2.2 and replace with the following	Hardcopy reports to be presented in PACP standard format.
3.10	**Root cutting & Removal**	Delete 3.10.1 and replace with the following	Remove roots for condition codes RT, RM, and RB.
3.12	**Coding Accuracy**	Delete 3.12.1.2 and replace with the following	Detail accuracy 90%
		Delete 3.12.4 and replace with the following	An operator failing to meet the accuracy requirements on two occasions will not be permitted to code on the remainder of the project until they have successfully re-attended an Operator's Certification course, re-write and pass the NASSCO Pipeline Assessment Certification Program.

END OF SECTION

1.8	**Measurement and Payment**	Delete 1.8.2 and replace with the following	Payment for watermain and service connection will include locatiing and exposure of existing utilities, trench excavation, dewatering, on-site re-use of surplus/displaced material, bedding, supply and installation of pipe, service connections, bolts, gaskets, thrust blocks, couplings (Robar 1506), restraints and tie rods, native excavated backfill material compacted in place, cleaning, pressure and leakage testing, flushing, disinfection where required and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. 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. Native excavated material approved for re-use as trench backfill shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density.
		Add 1.8.2.1	Payment for the watermain service pipe on Mitchell Street will include sawcutting existing asphalt and concrete (curb/gutter and sidewalk),removal and disposal offsite of asphalt and concrete (curb/gutter and sidewalk), locating and exposure of existing utilities, trench excavation, dewatering, offsite disposal of displaced material, bedding, supply and installation of pipe, gate valves, cap, bolts, gaskets, thrust blocks, couplings (Robar 1506), restraints and tie rods, native excavated backfill material compacted in place, cleaning, disinfection where required, and all other work and materials necessary to complete installation as shown on Contract Drawings (Drawing 19 of 27) and specified under this Section. <u>Payment for this item includes all of the necessary temporary and permanent restoration works. The site must be restored to original condition or better.</u> Payment for this items will be made at the lump sum price bid.
		Delete 1.8.3 and replace with the following	Payment for inline gate valves or butterfly valves including valve boxes; 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 fiitings, 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 1.8.13 and replace with the following	Payment for all tie-ins to existing watermains will include all pipe materials, fittings, test points, blow off assembly, excavation to expose the existing main to confirm location, grade, size, material & condition. Payment will be made on a per Lump Sum basis for each tie-in.

		Add 1.8.15	Payment for new hydrants installed on the new main includes the hydrant body, c/w Storz "quick connect" pump nozzle, lateral connections from mainline tee off watermain to hydrants, all new pipe, isolation gate valve, valve box & cover, valve stem riser pipe, bends, couplings (Robar 1506), any necessary pipe extensions to achieve the required hydrant height, concrete thrust block, tie rods, bedding material, testing and disinfection, surface restoration as indicated in the requirements in 1.8.2 of this Section and all other incidental work as shown on Standard Detail Drawing W4. Measurement will be made at the unit price bid for each hydrant assembly installed.
2.0	**PRODUCTS**		
2.2	**Mainline Pipes, Joints and Fittings**	Add to 2.2.1.1	Pipe: to AWWA C151, and shall meet the following Pressure Class or Thickness Class: .1 100 mm – 350 mm – Thickness Class 50 .2 400 mm & greater – PC 350
		Delete 2.2.2.2 and replace with the following	Joints: It is mandatory that the push-on integrally thickened bell and spigot type conform to ASTM D3139 Clause 6.2 with single elastomeric gasket to ASTM F477.
		Delete 2.2.4.13 and replace with the following	Joint Restrain Devices: General Requirements: .1 Ductil 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 apecial 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 Delete 2.3.1.4	Valves 400 mm and larger shall be butterfly valves.
		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 (ie-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 Bateriological 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 Superintendant.

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 Superintendant 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

1.6	**Measurement and Payment**	Delete 1.6.1 and replace with the following	Payment for sanitary sewer will be made at the unit price bid for sanitary 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 sanitary sewers and fittings includes locating existing utiltities, trench excavation, dewatering, bypass pumping, on-site reuse of surplus/displaced material, supply and installation of all pipe, fittings and related materials, tie-ins to sanitary pipe, anchor blocks, construction joints, bedding, native backfill, cleaning and flushing, testing (if applicable), videoing and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Measurement for sanitary sewer will be made horizontally from manhole centerline to manhole centerline over surface work has been completed. Native excavated material approved for re-use as trench backfill shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density.
		Add 1.6.2.1	Payment for the sanitary sewer pipe and fittings on Mitchell Street includes locating existing utiltites, sawcutting existing asphalt and concrete (curb/gutter and sidewalk), removal and disposal offsite of asphalt and concrete (curb/gutter and sidewalk), trench excavation, dewatering, bypass pumping, offsite disposal of displaced material, supply and installation of all pipe, fittings, inspection chamber, and related materials, tie-ins to sanitary pipe, anchor blocks, construction joints, bedding, native backfill, cleaning and flushing, testing (if applicable), videoing and all other work and materials necessary to complete installation as shown on Contract Drawings (Drawing 21 of 27) and specified under this Section. <u>Payment for this item includes all of the necessary temporary and permanent restoration works. The site must be restored to original condition or better.</u> Payment for this items will be made at the lump sum price bid.
2.0	**PRODUCTS**		
2.1	**Concrete**	Add to 2.1.1 and 2.1.2	Prior approval from Contract Administrator and the City for use of concrete pipe in a sanitary sewer installation.
		Delete 2.1.3.4 and replace with the following	Lift insert opening not required to be grouted provided it does not extend beyond the depth of the engineered design.
2.3	**Service Connections**	Delete 2.3.8.1	
		Delete 2.3.8.2 and replace with the following	Connections to mainline PVC pipe to be made with a manufactured wye fitting when mainline pipe is 250 mm and smaller.

			For new connections to existing mainline greater than 250 mm use of insertable tee will be permitted
		Add 2.3.8.3	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.
		Add 2.3.8.4	Rubber couplings for gravity sewers shall have stainless steel shear bands along the body of the coupling.
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* 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 PVC mainlines 250 mm and smaller shall be made by removal of the section of the main and replacement with a preformed extrusion molded PVC wye fittings 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 250 mm use of insertable tee will be permitted.
3.10	**Service Connection Installation**	Delete 3.10.3 and replace with the following	Inspection chambers shall be provided on all sanitary service connections as per Standard Detail Drawing S7. If inspection chamber is located in driveway, lane, or paved surface, Series 37 concrete box with lid shall be installed as per Standard Detail Drawing S9.
3.18	**Video Inspection**	Delete 3.18.1 and replace with the following	The contractor shall video inspect completed sanitary 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 Administator and the City. Refer to Section 33 01 30.1 and 33 01 30.1S CCTV Inspection of Pipelines.
3.21	**Permanent Capping of Service Connections**	Add 3.21.1	Permanent capping of existing sanitary service connections to be completed as per Coquitlam Standard Detail Drawing COQ-S18.
		Add 3.21.2	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

1.6	**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 trench excavation, dewatering, bypass pumping, on-site reuse of surplus/displaced material, supply and installation of all pipe, wyes, fittings and related materials, mitre fitting & joints, tie-ins to storm pipe, anchor blocks, construction joints, bedding, native backfill, cleaning and flushing, testing (if applicable), videoing and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Measurement for storm sewer will be made horizontally from manhole centerline to manhole centerline over surface work has been completed. Native excavated material approved for re-use as trench backfill shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density.
		Add 1.6.2.1	Payment for the storm service pipe on Mitchell Street includes, sawcutting existing asphalt and concrete (curb/gutter and sidewalk), removal and disposal offsite of asphalt and concrete (curb/gutter and sidewalk, trench excavation, dewatering, bypass pumping, offsite disposal of displaced material, supply and installation of all pipe, wyes, fittings and related materials, mitre fitting & joints, coring into the existing 900mm pipe, anchor blocks, construction joints, bedding, native backfill, cleaning and flushing, if necessary, videoing and all other work and materials necessary to complete installation as shown on Contract Drawings (Drawing 20 of 27) and specified under this Section. <u>Payment for this item includes all of the necessary temporary and permanent restoration works. The site must be restored to original condition or better.</u> Payment for this items will be made at the lump sum price bid.
		Delete 1.6.5 and replace with the following	Payment for catchbasin, lawn basin & electrical box leads include all applicable materials and work described in 1.6.2 Measurement for catchbasin, lawn basin & electrical box leads be made horizontally from mainline pipe to centreline of catchbasin or lawn basin for each pipe size installed with no regards to depth range.
		Delete 1.6.6 and replace with the following	Payment for trench dams, dispersal trench and perforated drain pipes includes all applicable materials and work described in 1.6.2 of this Section and as shown on the Contract Drawings. Payment will include filter fabric surrond, drain pipes and fittings, cleanout, drain rock, dam sacks, connection to catch basin, lawn basin or manhole as described for each item in the Schedule of Quantities.

		Delete 1.6.8 and replace with the following	Payment for fiitings, unless specified in the Schedule of Quantities and Prices, performed under this section will be incidental to payment for work described in other Sections. Payment includes all applicable materials and work described in 1.6.2 & 1.6.5.
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 connectons 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

1.0	**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 1.5.1.1 and replace with the following	Payment for all manholes will be on a unit rate basis per manhole, for the varying diameters/sizes, and includes excavation, on-site reuse of surplus/displaced material, dewatering, base preparation and compaction, manhole base, benching, lid, slab, frame & lid, cover, ladders & setting frame & lid to the finished grade, except riser for circular manholes in accordance with the Contract Drawings. Shop drawings are to be provided for review/approval for the flow control box manhole (DMH5.1) and the 450 mm sluice gate. Payment for imported trench backfill will be made under Section 31 24 13S – Sub-section 1.8.7.	
		Delete 1.5.1.2 and replace with the following	Payment for manhole riser sections will be for risers of standard or non-standard heights required to complete manhole from specified invert to finishing level. Payment includes all risers as shown on the Standard Detailed Drawings. Measurement will be made vertically for the length of risers required from the top of the manhole base (cast-in-place or precast) to reach the underside of concrete lid or slab.	
		Delete 1.5.2 and replace with the following	Catchbasin and lawn basin Installation will be defined as supplying and installing a new catch basin or lawn basin for each type specified and setting to the finished grade. Payment includes excavation, disposal of surplus excavated material, supply of all units, 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.	
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 catchbasins 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

1.0	**GENERAL**		
1.1	**Measurement and Payment**	Add 1.1	Lump sum price, unless specified otherwise in the Schedule of Quantities and Prices, includes all labour, materials and equipment necessary to complete the installation of the underground utility ducts as shown on the Contract Drawings. The work is to conform to the most current utility company's Specifications. The payment includes the transport and installation of the vaults, precast concrete manholes, pads, splice boxes and ducts, including full excavation, form and concrete work, reinforcing steel, bricking and setting vaults, precast concrete manholes and splice boxes, frames & covers, supplying/laying duct(s), supply/backfilling & compaction of gravels & sands, import 75mm minus granular subbase backfill and all other work shown on the drawings or as specified in the utility company's Specifications.
2.0	**STANDARDS & SPECIFICATIONS**		
2.1	**BC Hydro**	Add 2.1	All construction to comply with most current BC Hydro Standards & Specifications No. 1323 and ds-ES54-Underground-Civil-Manual-2004.
2.2	**Telus**	Add 2.2	All construction to comply with most current Telus Standards & Specifications No. 6003 & 6020.
2.3	**Shaw Cable**	Add 2.3	All construction to comply with most current Shaw Cable Standards & Specifications.
2.4	**Fortis BC**	Add 2.4	All construction to comply with most current Fortis BC Standards & Specifications.
3.0	**MATERIALS**		
3.1	**BC Hydro Material List**	Add 3.1	Contractor is responsible to supply all civil materials to construct the works, including ducts & duct accessories, gravels, sands, concrete, reinforcing steel, forming lumber and other miscellaneous construction materials. Precast structures, manholes & vaults, shall be supplied by BC Hydro.
3.2	**Telus Material List**	Add 3.2	Contractor is responsible to supply all civil materials (additional to the below) to construct the works, including ducts & duct accessories, gravels, sands, concrete, reinforcing steel, forming lumber and other miscellaneous construction materials. Precast structures, manholes & vaults, shall be supplied by Telus.
3.3	**Shaw Cable Material List**	Add 3.3	Shaw Cable will provide all civil materials (additional to the below) to construct the works except for gravels, sands, concrete, reinforcing steel, forming lumber and other miscellaneous construction materials.

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 CONTROL, VEHICLE ACCESS AND PARKING - 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. The Road and Sidewalk Closure Permit Request form is attached as **Appendix 1** to this document. 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: Road and Sidewalk Closure Permit A Road and Sidewalk Closure Permit form application must be submitted to the City's Traffic Operations Division five (5) working days prior to start of work.
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 Identification of risks to traffic during the Work .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.

.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.

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

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.

3.5 Detours

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

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

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

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 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 total road closure of Burke Village Promenade will be permitted to complete the storm works.

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.

5.0 CONSTRUCTION OPERATIONS

5.1	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**.
5.2	Road Specific Considerations	.1 Ensure that Traffic Management Plan accommodates businesses and residences during construction activities.
5.3	Work stoppage due to traffic	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.
5.4	Construction Activity and Signage	The Contractor will be responsible to place other construction information signs as required to inform the public of construction activities, and ensure safe travel through the work site.

APPENDIX 1

Coquitlam

City of Coquitlam

Road and Sidewalk Closure Permit Request

Traffic Operations Division
3000 Guildford Way, Coquitlam BC V3B 7N2
Phone: 604-927-6250 Fax: 604-927-6255
Email: trafficoperations@coquitlam.ca

Submit to the Traffic Operations Division a minimum of 5 business days prior to the intended closure date.

Permit Fee - [redacted] **Payment Methods** – After review, and if approved, payment options will be emailed to the applicant.

Application Date: _____ **City Project Number** (if applicable): _____

Contact Information

Company Name: _____

Applicant Name: _____

Name of Contractor doing work for Company/Applicant: _____

Phone: _____ **Fax:** _____

24 Hour Emergency Phone: _____ **Email:** _____

Location, date and time, and traffic control plan information

I request approval to close (check all that apply): Direction: ☐ Northbound ☐ Southbound ☐ Eastbound ☐ Westbound

☐ Curb/Outside Lane ☐ Centre/Inside Lane ☐ Right Turn Lane ☐ Left Turn Lane ☐ Cycling Lane ☐ Sidewalk

☐ Single Lane Alternating Traffic ☐ Full Closure

Road/Street Name: _____

Location Description: _____

Date & Time Information:

Dates: _____ *Starting* _____ *Ending*

Hours: _____ *Starting* _____ *Ending*

Purpose: _____

Will this closure disrupt: Bus Routes or Stops? ☐ Yes ☐ No If yes, the Applicant will need to contact Coast Mountain Bus Company regarding disruptions.

Will this closure disrupt: Garbage/Recycling Routes or Pick Up? ☐ Yes ☐ No If yes, the Applicant will need to assist the contractor and/or contact the City's Environmental Services Group. www.coquitlam.ca/trashtalk

Traffic Control Plan*:
(a) Traffic Management Manual for Work on Roadways Figure Number _____, or
(b) A Traffic Control Plan *(attach separately)* indicating signage, taper lengths, direction of traffic, work area, and north arrow

Traffic control persons (flag persons) on duty? ☐ Yes ☐ No If yes, specify how many: _____

** **Important Notice:** All operations within the road right-of-way must comply with Worksafe BC regulations and BC Ministry of Transportation standards for work on roadways.*

Application Checklist

- ☐ Permit Fee
- ☐ Prime Contractor Designation Letter
- ☐ City of Coquitlam Certificate of Insurance
- ☐ Traffic Control Plan or Traffic Management Manual for Work on Roadways Figure Number
- ☐ Coast Mountain Bus Company (Phone: 778-593-5774 | Email: special.events@coastmountainbus.com) contacted regarding impact to bus routes and bus stops
- ☐ City of Coquitlam Environmental Services Group (Phone: 604-927-3500| Email: wastereduction@coquitlam.ca contacted regarding impact to garbage/recycling routes and pick up

I HEREBY AGREE to the terms stipulated herein and further agree to indemnify and save harmless the City against any and all claims, actions, or expenses whatsoever or by whomsoever brought against the City by the reason of the City granting us this Road and Sidewalk Closure Permit. I further agree to accept responsibility to ensure proper situation control and street sweeping for the duration of the road or sidewalk obstruction.

_____ _____
Date *Applicant Signature*

Office Use Only PERMIT STATUS

☐ Permit Fee	☐ Prime Contractor Letter	☐ Certificate of Insurance
☐ Traffic Control Plan	☐ Impact to bus service	☐ Impact garbage and recycling collection

☐ Request is denied for the following reason(s): _____

_____

☐ Request is approved with the following change(s): _____

_____

☐ Request is approved as submitted

_____ _____
Date *Traffic Technologist or Designate*

Appendix B

Construction Environmental Management Plan

Lower Burke Road Construction (2020)

Construction Environmental Management Plan (CEMP)

Prepared for:

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

Prepared by:

ENKON ENVIRONMENTAL LIMITED
207 – 5550 152nd Street
Surrey, BC
V3S 5J9
Phone: 604-574-4477
Fax: 604-574-4353
E-mail: enkon@env.enkon.com

Project No. 1366-018.07

January 2020

Executive Summary

This document summarizes the construction phase environmental management plan for the tree clearing phase and civil road construction for the Lower Burke Roads. The subject roads defined as the Lower Burke Roads will be constructed within the forested lands currently bound by Mitchell Street to the North, Burke Village Promenade to the north, and the active road construction projects at Rocklin Street and Gislason Avenue to the east and south, respectively. Roads to be constructed include Road A, Road B, and a future multi-use pathway alignment (Road C).

Tree falling, site clearing, and road construction will be restricted to Road A and Road B at this time. Pending final civil and environmental design consideration for the MUP, clearing will be advanced for the Road C segment.

The project is located on the south facing slopes of Burke Mountain. The site experiences significant rainfall events and runoff. Formal water management and sediment control best practices will require careful planning, installation, maintenance, and monitoring.

The proposed road project will require explicit consideration of environmentally sensitive areas and watershed management considerations based on direct and indirect hydrologic linkages to fisheries sensitive resource values. Direct risks to downstream aquatic resources include the project interface with two (2) tributaries to Baycrest Creek, a permanent non-fish bearing watercourse. Baycrest Creek is a tributary to Hyde Creek and provides important water supply, food, and nutrient contributions to downstream fish habitat. The aquatic and riparian habitats in the vicinity of the road project provides important wildlife habitat values and intrinsic ecological values.

Critical environmentally sensitive areas include the bed and banks of Baycrest Creek and the associated riparian vegetation including tree root protection zones applicable to the streamside protection and enhancement areas and critical windfirm boundary edge trees.

Further to consideration of environmentally sensitive areas (e.g. aquatic and riparian habitats), consideration of the increased risk of adverse water quality impacts will be required during all phases of road construction to mitigate impacts affecting downstream aquatic habitat and water resource values. In future, the MUP will include one (1) crossing of the Baycrest Creek mainstem channel. The crossing will require compliance with the *Water Sustainability Act*. A crossing is not proposed for completion at this time; however, a Water Sustainability Regulation Notifications and compliance with regional terms and conditions for instream works best management practices will be required.

The CEMP is an important tool to ensure that construction managers, contractors, field staff, and municipal regulatory staff are informed of the risks, and prepared to mitigate or avoid adverse environmental impacts. Strict adherence to the pre-established clearing boundaries, vegetation protection restrictions, environmentally sensitive area restrictions, installation of temporary water

management measures, and erosion and sediment control requirements, is required in accordance with the approach outlined with this Environmental Management Plan.

The Construction Environmental Management Plan (CEMP) as presented herein outlines site specific work sequencing requirements and explicit monitoring, inspection, certification and sign-off procedures to mitigate the risk of adverse impacts affecting riparian buffer zone integrity, aquatic habitat values, and water quality during the completion of road works. All works must ensure that erosion and sediment control (ESC) best practices including access/egress controls, perimeter controls, clean-water management, incidental water management, and disturbed surface protection are followed.

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1.0 INTRODUCTION

1.1 Background

The City of Coquitlam (CoQ) requires construction services associated with the development of local roads in support of subdivision and development of the Phase 2 lands within the Partington Creek Neighbourhood Plan Area (PCNPA).

Figure 1 and illustrate the location and extent of the proposed street extensions. The proposed road network will yield transportation and pedestrian routes bound to by the previously completed Mitchell Street and Burke Village Promenade to the west and north, respectively. Active construction associated with Rocklin Street and Gislason avenue define the east and south boundaries, respectively.

The construction environmental management plan (CEMP) presented herein is intended to define the locations of explicit environmental sensitivity, timing constraints regarding tree clearing and project specific best management practices to mitigate risks to the environment and water quality.

The road network to be developed includes the following segments (Figure 1):

- Road A – linking Mitchell Street to Burke Village Promenade
- Road B – Linking Road A to the Gislason Avenue alignment
- Road C – a future multi-use pathway (MUP) linking Road A to the Rocklin Street alignment.

The road and MUP corridors interface with two (2) headwater tributaries defining the Baycrest Creek stream network. Clearing limits require explicit consideration of the hillslope hydrologic dynamics defining the stream origins and the interface with sensitive riparian habitats defined by the streamside protection and enhancement area (SPEA) buffer zones.

The clearing and construction of the Road C corridor and the associated MUP is not proposed for completion at this time. Pending future civil and environmental design, the clearing of the Road C corridor may be included in the project scope. The ultimate MUP construction will require a stream crossing of the Baycrest Creek mainstem. The stream crossing design will require compliance with regulatory requirements of the *Water Sustainability Act*.

The limits of construction and associated clearing limits have been prepared based on detailed design drawings as prepared by ISL Engineering and Land Services (ISL). Where applicable, the clearing limits and site specific constraints outlined in this CEMP shall be followed to ensure compliance with riparian area protection requirements.

Before construction may begin, the successful contractor must review this CEMP and ensure that site superintendents and project staff are familiar with site specific strategies to deal with:

- Watercourse locations, classifications, and significance

- Clearing limit boundaries;
- Vegetation protection requirements
- Temporary water management best practices including management of incidental groundwater, seepage, surface runoff, and/or stormwater inflows;
- Erosion & Sediment Control BMPs;
- Spill prevention and emergency response planning;
- Solid waste handling procedures;
- Incidental wildlife occurrences.

All works shall be completed based on issued for construction drawing sets and in consultation with the ENKON Environmental Limited (ENKON). Site review of physically flagged clearing limits will be required prior to initiating falling. Riparian protection boundaries will require formal tree protection fencing installations prior to proceeding with grubbing activities and proceeding to earthworks.

1.2 Purpose of EMP

The purpose of the EMP is to provide contractors, environmental monitors, municipal regulatory staff, and project managers with guidance and procedures to mitigate potential impacts that may adversely affect environmental resources and habitat values.

The primary focus of the EMP will be the adherence to timing restrictions and best practices related the following

- Tree clearing and vegetation removal activities (i.e. timing constraints re: compliance with Section 34 of the *Wildlife Act* and *Migratory Birds Convention Act*);
- Erosion & Sediment Control;
- Incidental Water Management (i.e. best practices associated with the management of incidental surface runoff or local seepage);
- Wet Weather Operating Procedures;
- Future "in-stream & near-stream" works (i.e. timing constraints and compliance with Instream Works Standards & Best Practices).

Following completion of any site disturbance or exposure of erodible materials, proactive measures to manage for forecast rain events, incidental hillslope runoff, or direct precipitation affecting working zones must be implemented through to completion of final paving and associated landscaping.

EMP 10

Lower Burke Roads Project (2020)

Client: City of Coquitlam

Legend

- High Water mark
- SPEA
- Wetland 30m
- Headwater mgmt zone
- Windfirm RPZs
- Clearing Limits
- Active Construction
- Lower Burke Roads
- Existing Conditions

Projection:
NAD 83 UTM
Zone 10N

2018 Imagery:
Used with permission from the City of Coquitlam

Scale - 1:2,000

Figure 1

Author : R. Preston

January 27, 2020

Prepared by: ENKON Environmental Ltd.

Path: N:\GIS_Base\1366-018 David Ave\007 - Lower Burke Roads\CEMP_Lower Burke Roads 2020.mxd

1.3 Environmental Sensitivities

1.3.1 Aquatic Resources

The proposed works require construction activities in the immediate vicinity of Baycrest Creek. The Baycrest Creek stream network includes two (2) first-order headwater tributary streams. Baycrest Creek is a non-fish bearing, permanent watercourse (e.g. flows for >6months per year). The watercourse and associated riparian buffer zones provide important wildlife habitat and provide important water supply, food, and nutrient resource values to downstream fish habitat.

In addition to natural aquatic ecosystems, civil servicing project components will connect with the Hyde Creek Diversion Sewer, a major trunk storm diversion sewer with connectivity to DeBoville Slough, a major fish bearing watercourse providing important salmon migration route to the Partington Creek and Hyde Creek systems (Table 1).

Table 1 – Sensitive Watercourses Within the Project Area

Watercourse Name	Classification	Location
Baycrest Creek	Permanent non-fish bearing watercourse with fish downstream	Located along the immediate east and southeast clearing boundaries between Road B and intersection with Burke Village Promenade.
DeBoville Slough	Permanent Fish Bearing Channelized Stream	Connected to the project area via the Hyde Creek Diversion Sewer. Note: Diversion sewer to be connected via Road B civil servicing.
Interim clean-water interceptor ditch (Anticipated)	Non-Fish Habitat Ditch (Temporary Interceptor Drainage)	North boundary margin of Road A.

1.3.2 Streamside Protection and Enhancement Areas

Riparian area vegetation associated with Baycrest Creek is protected under the Province of BC's Riparian Areas Protection Regulation (RAPR) and City of Coquitlam Zoning Bylaw Section 523. Riparian area vegetation provides bank stabilization, shade, litter fall, and insect drop functions to the watercourses.

The Streamside Protection and Enhancement Area (SPEA) buffer zones and applicable 'measures' to protect the integrity of the SPEA has been formally defined through the submission of a formal assessment and notification prepared under the prior Riparian Areas Regulation (RAR). RAR Notification File No. 4340 defines a 10m SPEA setback with additional considerations for windfirm edge tree management through protection of the root protection zone (RPZs) as determined by a Registered Professional Forester (RPF).

Figure 1 illustrates the location of the SPEA setbacks, critical windfirm edge trees and prescribed RPZs. Generally clearing limits should be restricted to within 1.5m of the prescribed SPEA and windfirm edge trees.

1.3.3 Significant Natural Features

Significant natural features (SNF) as defined by the City of Coquitlam's Guide to Best Site Development Practices (April 2005) include vegetation, geologic, and hydrologic natural features that

The previously completed assessments have identified the hydrologic features of significance which include the west and east headwater tributaries of Baycrest Creek. Geologic features have not been identified within the Partington Lands, Phase 2 study area. Vegetation features providing potential 'ecologic or aesthetic benefits to the community' have previously been identified as including veteran stumps reflecting the areas logging and fire history.

One specific stump has been previously identified and was the subject of a local online media story speaking to the intrinsic value of heritage features[1]. The burned western redcedar stump is located along the north margin of the proposed Road A corridor.

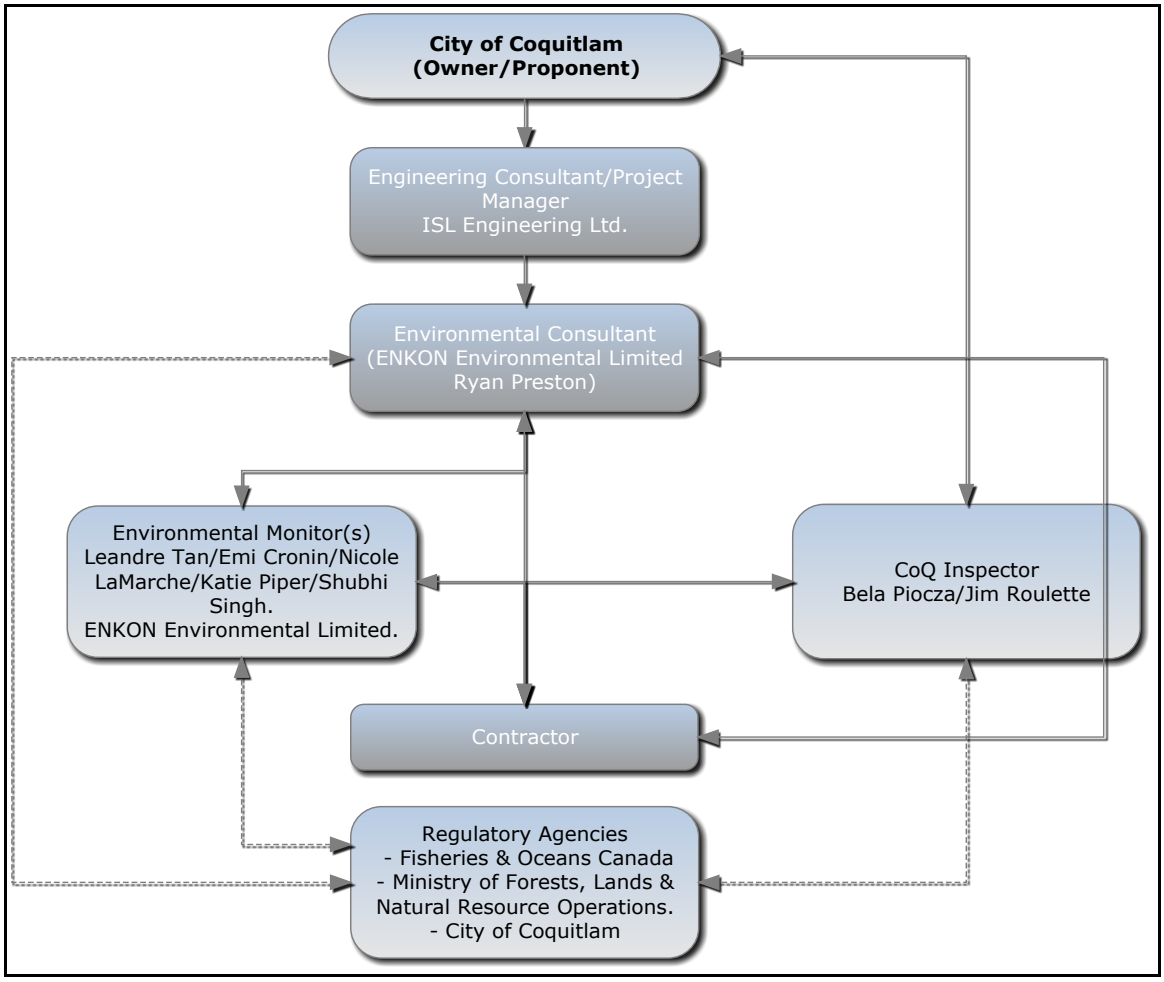
Physical delineation and flagging of the stump location is recommended prior to site clearing. Retention of the stump is recommended, if possible. Salvage and relocation may be an option if roadworks and grading preclude retention of the stump.

[1] https://www.tricitynews.com/news/centuries-old-cedar-stump-a-symbol-of-burke-s-past-1.23109708

2.0 ROLES & RESPONSIBILITIES

The following summarizes key roles and responsibilities of the various staff involved in the project. Figure 2 outlines the general organizational chart for the key environmental roles:

Figure 2 Lower Burke Roads - CEMP Organizational Chart



2.1 Owner

The City of Coquitlam is the Owner and Proponent for the proposed project.

2.2 Engineering Consultant

ISL Engineering and Land Services (ISL) has completed the detailed engineering design and will be responsible for the issuance of issued for construction (IFC) drawings and engineering inspections. ISL will act as the Project Manager and key contact responsible for site operations, design consultation, inspection, and will be the contractor's main point of contact.

ISL has prepared a project specific erosion and sediment control plan for implementation in support of the road construction project.

2.3 Environmental Consultant

The Environmental Consultant will be responsible for ensuring compliance with the terms and conditions of regulatory requirements (i.e. senior government legislation and/or best practices). The Environmental Consultant will coordinate all environmental monitoring inspections and reviewing regularly submitted Environmental monitoring reports.

Concerns related to compliance with clearing limits, ESC best practices or water quality results will be communicated directly to the Project Manager and Contractor to ensure that adaptive measures are implemented immediately and that any significant ESC plan modifications are approved.

The Environmental Consultant will be responsible for attending the pre-construction/pre-clearing site meetings and reviewing proposed clearing boundaries in addition to post-clearing site inspections and environmental monitoring during construction.

2.3.1 Environmental Monitors

Environmental Monitors will be responsible for part-time monitoring during tree clearing operations and general construction activities to review compliance with ESC best practices and project specific ESC plans.

Full time monitoring will be required during riparian area clearing activities and instream works related to future extension of the Road C MUP corridor. Future crossing of the watercourse will require *Water Sustainability Act* regulatory compliance – specifically compliance with Section 11, changes in and about a stream.

Regular (e.g. weekly) monitoring will be required to ensure that appropriate ESC best management practices are implemented. Monitoring will include inspections following significant rain events (i.e. rain events in excess of 25mm in 24 hours).

Monitors will prepare regular environmental monitoring summary reports for submission to all team members on a maximum bi-weekly basis. Additional interim reporting or correspondence to provide "adaptive recommendations" will be the responsibility of the Environmental Monitors.

2.4 City of Coquitlam Inspector

The City of Coquitlam (CoQ) Inspector will be responsible for regular site inspections to verify compliance with clearing limits and general work practices including ESC plan compliance and civil design requirements.

It is anticipated that the CoQ Inspector will be a representative of the City of Coquitlam's Engineering Department. Additional municipal inspections may include representatives of the City of Coquitlam's Environment group (i.e. environmental and worksite bylaw officer).

2.5 Contractor

The Contractor will be responsible for the physical completion of all works. Any activities to be completed by sub-contractors (i.e. tree falling and grubbing) will require site orientation to ensure compliance with the working limits and environmentally sensitive areas.

The site contractor will be required to inspect the function of water management measures and ESC measures on a regular basis and report any potential concerns or deficiencies to the Environmental Consultant and/or CoQ Inspector.

All site staff shall be oriented to the location and significance of the sensitive aquatic habitats, riparian habitats, root protection zones and downstream fish habitat values.

Adherence to the wet weather operating guidelines will be the responsibility of the contractor. As such, regular review of weather forecasts and consultation with the Environmental Consultant will be required.

3.0 ENVIRONMENTAL CONSIDERATIONS

3.1 Vegetation Clearing

Compliance with the approved clearing limits is required to mitigate impacts to existing forest habitats in advance of further subdivision or residential development applications.

Vegetation removals will require the formal delineation of the clearing limits with high visibility flagging or wood lathe prior to initiating falling activities. A review of clearing limits at riparian zone interfaces is required to ensure compliance with the RAPR SPEA setbacks inclusive of windfirm and edge tree root protection zone (RPZ) buffers.

3.1.1 Breeding Bird/Nesting Considerations

Vegetation removals will require explicit consideration of breeding bird nest activities.

Specifically, Section 34 of the *Wildlife Act* and Section 6(a) of the *Migratory Birds Convention Act*, Migratory Birds Regulation require that vegetation removals are completed with due consideration of the following:

a) Clearing shall be completed in advance of nesting season[2], or
b) Subject to a breeding bird and nesting survey completed by a qualified wildlife biologist and written approval to proceed.

Generally, clearing should be completed between the period of September 1 to February 28 to minimize the risks of affecting breeding birds.

Table 2 summarizes the Province of BC's Develop with Care guidelines with respect to vegetation removal timing.

Table 2 – Breeding Bird Least Risk Window

Bird Nesting	Window of Least Risk

[2] Refer to Environment Canada. 2014. General Nesting Periods of Migratory Birds in Canada [Online] URL: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1 and Province of BC. 2012. Develop with Care – Environmental Guidelines for Urban and Rural Land Development in British Columbia; Section 4 – Environmentally Valuable Resources (Table 4-2) [Online] URL: http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2012/DWC-Section-4.pdf

Other raptors[3]	October 1 – February 28
Passerines	September 1 – February 28

Environment and Climate Change Canada provide additional guidance to avoid 'incidental take' of nesting migratory birds. Any tree clearing to be completed between March 15 and August 15 will require assessment and/or supervision by a qualified environmental professional (QEP) with expertise in wildlife biology and breeding bird behaviour (See Figure A).

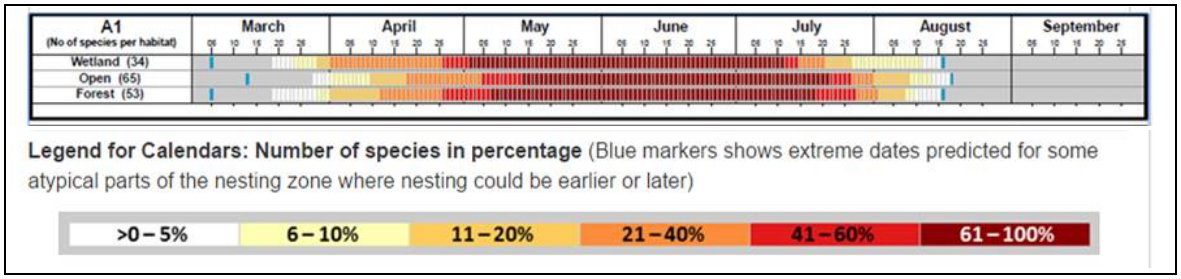


Figure 3 Calendar for Nesting Zone A1 which is located in the BC's South Coast Region.

No impacts to trees or vegetation outside the approved clearing limits will be permitted. Any incidental damage to trees, shrubs, and their associated rooting zones will require assessment and site specific recommendations regarding treatment or replacements by an ISA Certified Arborist or Tree Risk Assessor. Any requirements for assessment of trees beyond the approved clearing limits will be the responsibility of the Contractor.

3.2 Aquatic Resource Considerations

Interceptor ditches upslope of the proposed construction area are recommended to intercept natural surface runoff pathways and shallow sub-surface flows . Interceptor ditches will require formal consideration of downstream flow pathways to prevent adverse impacts to downstream aquatic habitats or private property values.

Surface flows generated on site from within active construction areas shall be directed to adjacent forest areas to maintain natural hillslope hydrology and facilitate dispersal and infiltration to ground.

Any water to be directly discharged to Baycrest Creek or the Hyde Creek Diversion Sewer shall be monitored for compliance with the City of Coquitlam's Stream and Drainage System Protection Bylaw N. 4403, 2013.

[3] Note: Bald Eagle nests, heron nests, or raptors considered under Section 34(b) of the wildlife act have not been previously identified within the project area.

3.3 Erosion & Sediment Control

The full scope of the road development project will be subject to the City of Coquitlam's Stream and Drainage System Protection Bylaw, No. 4403, 2013. Section 5 outlines preliminary erosion and sediment control (ESC) requirements.

The primary ESC risks with respect to the project and bylaw 4403 will include:

- the risk of sediment track-out to paved surfaces
- turbid water discharge into Baycrest Creek
- turbid water discharge into the Hyde Creek Diversion Sewer

3.4 Noxious Weeds Control

The BC Weed Control Act, Section 2 imposes a duty on all land occupiers to control designated noxious plants. Owing to the nature of the site and recent clearing of forested lands, invasive species occurrences have not been documented; however, any incidental encounter of invasive species or noxious weeds will require removal and handling to preclude the spread of weeds or persistence within the project area.

It will be the contractor's responsibility to remove any occurrences of noxious weeds from within the project area boundaries. The Invasive Plant Council of BC produces factsheets on Targeted Invasive Plant Solutions (T.I.P.S) to provide guidance for the management of common invasive plants[4].

[4] http://www.bcinvasives.ca/resources/outreach-materials/invasive-plants-tips

4.0 REGULATORY APPROVALS

4.1 Clearing Limits

Clearing limits require review and approval to ensure compliance with the Riparian Areas Protection Regulation, Zoning Bylaw Section 523, and terms and conditions of applicable Watercourse Development Permits.

Prior to commencement of the formal roadworks establishment of clearing limits shall be completed with physical delineation completed by high visibility flagging or staking. Prior to tree falling, tree clearing limits in the vicinity of the SPEA setbacks shall be completed by the Environmental Consultant. Clearing shall proceed subject to written confirmation of endorsement of the flagged (or field adjusted) clearing limits to ensure compliance with the RAPR and municipal requirements.

4.2 Future Instream Works

Works related to the ultimate transportation objectives include the future delivery of a MUP connecting Road A to Rocklin Street. The MUP corridor is identified as 'Road C'.

Clearing of Road C is not proposed within the initial site clearing proposed for completion in early 2020. The ultimate clearing limits shall include explicit consideration of impact mitigation to limit the project footprint at the stream and riparian crossing.

The future stream crossings require formal compliance with Section 11 of the *Water Sustainability Act*. Typically, crossings would be completed under a Notification under Part 3, Section 39 of the Water Sustainability Regulation. Final crossing designs will dictate the regulatory considerations and/or requirements for formal authorization.

No clearing along the Road C corridor for the culvert installation at Baycrest Creek will be permitted prior to acquisition of regulatory approval for the crossing designs.

5.0 WATER MANAGEMENT

The Project is situated on the south facing hillside of Burke Mountain and experiences significant rainfall events. In addition, the road alignment is often parallel to slope contours with resulting cut slopes yielding potentially significant interception of hillslope runoff and interflow.

The contractor will be required to prepare for significant rain events and runoff at the upslope limits of all active work zones such that incidental surface runoff does not overwhelm the project area and compromise road subgrades, excavation footprints.

Beyond management of incidental runoff within the project footprint, consideration will also be required for the management of offsite water (i.e. clean water interception) and the management of potential subsurface flows.

5.1 Clean Water Interceptor

It is anticipated that the in coordination with the implementation of the ESC plans, the contractor will need to include construction of a clean water interceptor ditch due to the risk of hillslope runoff and interflow.

Any interceptor ditches (as required) shall be maintained through to and following completion of construction. The maintenance of the clean water interceptor will be a key component of the implementation of an effective ESC plan and the contractor's construction phase responsibilities.

The Contractor shall implement all reasonable measures to capture, divert, or convey any additional offsite flows around the work area. Measures may include ditching or temporary surface pipes.

The ultimate discharge point of clean-water interceptor ditching shall be reviewed an endorsed by the Environmental Consultant, the Project Engineer, and the City of Coquitlam

5.2 Incidental Water Management

As noted above, water management must consider all surface water inflows, or significant groundwater seepages/interflow along the northern project limits. Further seepage zones may be experienced along cut-slope faces associated with site grading in addition to management of direct precipitation and runoff within the working limits.

Incidental water management shall include the establishment of formal interceptor swales at the toe of cut-slopes to capture and convey seepage flows around, across, or away from the road works.

Incidental water management may require localized dewatering via pumping during construction activities, temporary culverts to drain across the road alignment and discharge to vegetated

surfaces to the south, or direct connectivity to existing ditches associated with the Gislason Avenue alignment.

Pumping or gravity conveyance to undisturbed vegetated surfaces will be permitted subject to environmental monitoring and confirmation of infiltration.

No direct discharge of incidental turbid water to the project area watercourses or ditches with direct connectivity to downstream aquatic habitat or municipal storm sewers will be permitted.

Should monitoring confirm incidental surface connectivity to natural stream channels or stormwater infrastructure, in-situ turbidity monitoring will be required to confirm compliance with discharge criteria under The City of Coquitlam's Stream and Drainage System Protection Bylaw No. 4403, 2013 (i.e. 25 NTU under typical weather conditions, 100 NTU during wet weather conditions).

5.2.1 Temporary Water Management (Level Spreaders)

The temporary relief of construction site runoff may require the temporary capture and conveyance of sediment laden runoff to forested City of Coquitlam lands located downslope or adjacent to the road alignments

The following summarizes minimum criteria for the installation of construction phase "level spreaders" to manage construction phase site runoff:

- 375mm PVC from the sumps to the tees
- Min 4m of 300mm solid PVC on either side of the tees
- 20m of 300mm perforated PVC on either side with an end cap
- As perforated pipe may not be available in 300mm diameter, 19mm diameter holes will need to be drilled at 150mm on center. One row of holes at the pipe invert and one row at the springline.
- The perforated pipe must be installed level, and must be appropriately braced.

In the absence of level spreaders, rock lined sumps may be implemented to facilitate dispersal and infiltration to ground. Monitoring of surface flow paths from level spreaders or sumps will be required and will be the responsibility of the Environmental Monitor.

Subject to the performance of incidental water management measures and the efficacy of dispersal and infiltration, the management of construction phase runoff may require temporary facilities to provide capture, detention and treatment prior to discharge to downstream aquatic resources.

6.0 EROSION & SEDIMENT CONTROL REQUIREMENTS

Compliance with a project specific erosion and sediment control (ESC) plans will be required. It will be the responsibility of the contractor to comply with the site specific ESC plan including all aspects of prescribed project phasing, clean water management, ESC facilities, and disturbed surface treatment specifications.

The ESC plan shall define specific parameters for the following ESC best practices:

1) Erosion Control/Disturbed surfaces protection
    - Vehicle use/access restrictions
    - Working/running surface augmentation
    - Disturbed surface protection (including specifications and application rates).
2) Sediment Control/Perimeter Control
3) Incidental water management
4) Runoff Detention/Treatment
5) Wet weather operating guidelines

Contractors will be expected to implement all aspects of the ESC plan in a proactive manner and to address regular inspection and maintenance concerns to ensure that ESC facilities and BMPs are effective in mitigating of the risks to aquatic habitat and water quality.

In addition to compliance with the project specific ESC plans, implementation of adaptive measures and BMPs will be required to mange the risk of adverse erosion and sediment transfers in response to evolving project conditions. Compliance with the ESC plan and implementation of adaptive measures will be required to avoid progressive erosion and adverse effects to the integrity (both structural and visual) of the road corridor.

Table 3 summarizes key ESC BMPs and the objectives of individual BMPs in support of compliance with Bylaw No. 4403, 2013.

Table 3 – ESC BMP Objectives

ESC Objective	BMP	Objective
Erosion Control	6mil Poly Tarp – installed and secured	Provide temporary surface cover for active work areas or disturbed surfaces to mitigate the risk of erosion.
	Rolled erosion control product (RECP) – North American Green C125BN (or equivalent biodegradable product – no monofilament mesh	
	Straw mulch – 4500kg/ha application rate	
	Reclamation seed mix – applied @ 1200kg/ha	
	Rock mulch – 100mm thick 19mm clear crush rock	
	Hydraulic Erosion Control Product (HECP): Bonded fiber matrix (slopes ~2H:1V) applied at a minimum 3500kg/ha rate Flexible growth medium (slopes >2H:1V), applied at a minimum 4000kg/ha rate.	Provide permanent surface cover for completed disturbed surfaces. HECPs to be applied with reclamation seed mix and fertilizer as required per soils analysis. Treatment is to occur at 100m intervals along ditch and cut slopes.
Sediment Control	Silt Fencing – installed in 100mm deep anchor trench and backfilled per manufacturer's instructions.	Provide formal BMPs to facilitate the retention of sediment within the project footprint and prevent direct discharge to the receiving environment or municipal storm sewers.
	Straw wattle – 300mm diameter installed and staked.	
	Rock mulch berm/windrow – 19mm rock mulch berm (min. 500mm wide by 300mm height with exposed face wrapped in non-woven geofabric – Nilex 4553 or equivalent.	
	Wood grinding/hog-fuel berm – a 1m high x 1m width defining the downslope boundary of the clearing/grubbing limit to provide an effective perimeter control using wood residue resulting from site clearing activities.	
	Sediment basin/sump – 2m x 2m, 1m deep sump.	
	Flocculant treatment – 2lb Chitovan flocculant belt (or equivalent) deployed and in active use*	
	Catch basin filter sock protection	
Water Management	Interceptor ditch/Cross drain – Poly lined 2H:1V side slopes, min 300mm depth @ 4% grade.	Reduce effective slope length on erodible surfaces to mitigate the risk of erosion due to surface runoff.
	Diversion berm –Erosion resistant structure installed to intercept and divert surface runoff from upslope contributing areas	

ESC Objective	BMP	Objective
	Sand Bag Diversion berm – Sand bags installed to intercept and divert surface runoff from upslope contributing areas	
	Temporary ditch – Poly lined 2H:1V side slopes, 1000mm depth (into till), 1000mm wide base, complete with min 8" rock check dams spaced according to ditch gradient (Crest of lower check dam equivalent to invert of adjacent upper check dam.	Collect and convey site runoff to detention facilities or collect and convey clean water to divert around work areas.
	Incidental pumping/diversion – including fuel/power supply, intake hoses, and discharge hoses.	Provide temporary management of onsite flows to mitigate erosion risk.
Runoff Detention/Treatment	Sediment Pond/Trap - installed	Temporary pond or sediment trap installed to provide detention and settling of suspended sediment prior to discharge to the receiving environment.
	Sediment Detention Tank – installed and operational.	Surface mounted detention tank structures installed to provide runoff detention capacity to facilitate settling of suspended sediment prior to discharge to the receiving environment.

*The deployment and use of flocculant products to augment sediment control objectives will require interception of runoff and treatment via pumping over flocculant to facilitate mixing and subsequent capture of treated water to facilitate settling by gravity or active filtration prior to discharge to the receiving environment.

6.1 Wet Weather Procedures

Based on the project's location and risk to environment, the Contractor will be expected to implement appropriate wet weather operating shut-downs. Wet weather operation shut-downs will require consideration of both pro-active and re-active shut-downs.

Proactive shut-downs will be required in anticipation of forecast rain events >25mm. Reactive wet weather shut-downs will be required in response to rain events yielding significant surface runoff

or saturation of construction materials that are considered to pose an imminent risk to downstream resources.

6.2 Work Surface Augmentation

Due to the risks of direct precipitation and runoff, exposed road subgrades should receive consideration of working surface augmentation. In advance of paving, contractors may be required to augment working surfaces to mitigate the risk of direct surface erosion from rain-splash and initiation of rill or channel erosion due to runoff.

It is anticipated that exposed road sub-grades will require proactive covering with a suitable clear rock mulch to mitigate the risk of erosion during significant rain events or an alternative means of protecting erodible subgrade materials (i.e. temporary tarps). The effectiveness of working surface augmentation will rely heavily on the effectiveness of incidental water management, as noted above.

Subject to site grading, the implementation of periodic slope breaks may be required to reduce the effective energy of surface runoff.

6.3 Disturbed Surfaces Protection

The road construction will yield significant cut and fill slopes to achieve the road cross section and grades. The cut and fill slopes will remain in place until such time as future developments along road margins proceed, and as such, must be stabilized to achieve both water quality and visual objectives.

The project ESC plan will require proactive stabilization of completed cut and fill slopes. Compliance with the ESC objectives will require proactive treatment of cut and fill slopes in 100m segments to avoid the risk of significant erosion liabilities.

Formal Treatment of both temporary slopes which are expected to remain exposed for up to 2 months[5] and final slopes will be required to comply with ESC objectives.

Upon completion of grading of 100m segments, final cut and fill slopes cut at a maximum 2H:1V slope will require application of a hydraulic erosion control mulch (HECP) to provide a minimum 12 month functional longevity and a C-factor of ≤ 0.05. Application shall adhere to manufacturer's specifications with seed and fertilizer application rates dictate by results of onsite soil testing.

Incidental disturbed surface treatments will require mitigation of erosion potential through application of blown straw mulch applied at a minimum rate of 3000 kg/ha or alternative measures approved in writing by the Environmental Consultant.

[5] Note: temporary cut and fill slopes may be stabilized utilizing alternative measures including RECP's, Polyethylene Tarps, or blown straw mulch (subject to slope gradients).

6.4 Water Quality Monitoring

The Environmental Monitor will conduct water quality (turbidity) monitoring as part of routine site inspections. The monitoring will be done upstream (background) and downstream of the project areas and at project specific points of discharge.

Specific sampling locations will be determined by the Environmental Monitor. Key monitoring locations will include discrete discharge points to Baycrest Creek and/or the Hyde Creek diversion sewer.

Offsite monitoring will include visual assessments of downstream watercourses identified as within the project area's watershed influence – namely Baycrest Creek at Gislason Avenue.

The Environmental Monitor will measure turbidity as a surrogate for suspended solids because turbidity measurements provide instantaneous feedback on the effectiveness of ESC BMPs and onsite water management.

For the purposes of this project, a working limit of 25 NTU (nephelometric turbidity units) will be utilized for the upper limit for site discharges permitted for direct release to the aquatic environment under dry weather conditions. During wet weather conditions a working limit of 100 NTU will be utilized. All site discharges exceeding these limits require additional measures for treatment or infiltration prior to reaching the receiving environment.

7.0 INVASIVE SPECIES MANAGEMENT

Owing to the nature of the Project's location which includes a previously forested hillside and the recent clearing of the project limits, no occurrences of non-native invasive species have been recorded.

Any incidental encounters of noxious weeds as defined by the BC *Weed Control Ac*t will require the removal and treatment of the plants, roots and rhizomes to prohibit the spread of noxious weeds within the project corridor and surrounding area.

It will be the Contractor's responsibility to remove noxious weeds encountered within the project limits or appearing onsite during construction through to substantial completion.

Key noxious weeds or invasive species of concern for the project area may include the following:

- Japanese knotweed (*Falopia japonica*)
- Himalayan blackberry (*Rubus discolor*)
- Lamium (*Lamium galeobdolon*)
- English ivy (*Helix hedera*)
- Scotch Broom (*Cytisus scoparius*).

8.0 INCIDENTAL WILDLIFE ENCOUNTERS

The Project is situated in a forested area with frequent wildlife occurrences. Harassment or disturbance of wildlife will not be permitted.

It will be the responsibility of the Contractor to allow wildlife safe passage through the project area and avoid disturbance with machinery. The site must be managed so as to avoid wildlife attractants such as food waste. Food waste must be removed from the site at the end of each work day or must be stored in locked containers inaccessible to wildlife.

Species which may be encountered could include the following:

- Red-legged frog (*Rana aurora*)
- Western toad (*Anaraxyus boreas*)
- Black bear (*Ursus americanus*)
- Black-tailed deer (*Odocoileus hemionus*)
- Coyote (*Canis latrans*)
- Cougar (*Puma concolor*)

9.0 HAZARDOUS MATERIALS MANAGEMENT PLAN

9.1 Purpose

The purpose of the Hazardous Materials Management Plan is to provide a set of instructions for handling hazardous materials in a manner that should prevent spills. Implementing the Hazardous Materials Management Plan will minimize the risk of impacts to human safety or the environment from spills of fuels, oils and other hazardous materials.

9.2 Hazard Identification

9.2.1 Hazardous Materials

Hazardous materials that are anticipated for use on-site are listed in Table 4.

Any additional hazardous materials to be utilized by the Contractor shall be identified and an updated list posted onsite and distributed to the Environmental Consultant.

Table 4 - Hazardous Materials Anticipated for Rocklin Street, Burke Village Promenade, and Gislason Avenue Project.

Hazardous Material	Material Storage	Quantity
Gasoline	Plastic gas container	5 L
Gasoline-Oil Mixture	Plastic gas container	5 L
Diesel	Fuel truck (transient)	10,000 L

9.2.2 Risk Analysis

The following hazards potentially could be associated with the materials in Table 4:

- Spills/releases of hazardous materials; and
- Explosion and/or fire.

All works will be completed within the headwater catchment of natural watercourses providing fish and wildlife habitat values and pose a risk that liquid spills could enter the watercourses or groundwater, killing fish within downstream reaches and damaging habitat.

Spills or leaks of combustible liquids (gasoline and diesel fuel) and compressed gases carry a risk of fire and explosion, which would be a threat to human lives and property.

The potential for spills, fire and explosion will be minimized by following this Hazardous Materials Management Plan. If a spill does occur, the risks to human health and safety and the environment will be minimized by following the Spill Contingency Plan (Section 10.0).

9.3 Materials Storage

9.3.1 General

In general, hazardous materials will not be stored on-site. It is expected that a servicing company or the contractors own equipment will provide mobile refueling and oil for vehicles and equipment. Small amounts (5-L containers) of gasoline or a gasoline-oil mixture will be carried in vehicles for emergency use.

Criteria for storage include the following:

- No smoking will be allowed in the vehicles.
- Gasoline containers will meet the design specifications of the BC Fire Code.
- The contents of all containers will be clearly marked.
- Oil will be stored separately from flammable material.
- Containers will be stored upright with properly fitting lids securely fastened.
- Containers will be maintained in good condition – not damaged or rusting.
- Emergency response equipment, including fire extinguishers, spill clean-up and disposal equipment will be carried on the vehicles.
- Spill response instructions will be provided as part of site orientation.

9.3.2 Diesel Fuel

Fuel will be handled by tank trucks, which will come to the site to refuel equipment. The following practices for refueling will be implemented:

- Impact barriers will be set up, if necessary, to protect the tank trucks from impact by equipment.
- Spill clean-up and disposal equipment will be present at any fueling location.
- "NO SMOKING" signs, fuel handling and spill response instructions will be conspicuously posted near fueling areas.
- Fueling will be conducted using approved hose-reel and automatic closing nozzles.
- All fuel trucks will be inspected certified to the current CSA standard, as specified in the *Transportation of Dangerous Goods Regulations*. They also will meet current commercial vehicle inspection requirements.

9.3.3 Hazardous Wastes

Used oil and used spill clean-up materials (e.g. absorbent pads) constitute hazardous wastes. Used oil is a "hazardous waste" under the *Environmental Management Act, Hazardous Waste Regulation*. Such wastes will not be stored onsite. A servicing company or the Contractor will be responsible for equipment maintenance and will remove and deal with any waste oil. In the event of a significant spill of hazardous material, a third party experienced in site clean-up and remediation will be contacted. They would deal with clean-up and disposal of clean-up materials.

9.4 Equipment Servicing

9.4.1 General Maintenance

Most mobile construction equipment will be fueled, lubricated and serviced only within designated areas at least 30 m away from natural stream channels, drainage ditches and storm drains.

9.4.2 Fueling

Every precaution will be taken to avoid spillage during fuel transfers. Specific precautions include the following:

- Refueling of equipment shall be prohibited within 30m of project area watercourses
- All hoses and nozzles will be compatible with hydrocarbon fuel.
- A fire extinguisher will be on site while fuel is transferred.
- A metallic bond wire will be connected from the fill stem to the tank to protect against static charge during fuel transfer.
- Tanks will not be filled to capacity. At least one percent air space will be left for expansion of the product. Tanks will have an overfill device, and employees will use a dipstick to check fuel levels.
- Ignition will be shut off during fueling.
- A no smoking policy will be enforced around all flammable liquids;

9.5 Training and Communication

The Contractor shall provide spill response training to all individuals who are responsible for handling gasoline containers, explosives or other hazardous materials.

In addition, the Contractor must provide site-specific training to inform all employees of:

- The hazardous materials stored or used on-site and the associated risks;

- The location of sensitive fish habitat to be protected in the event of a spill (i.e., catch basins, watercourse crossings) and the pathways through which spills could reach a watercourse (i.e. roadside drainage and storm drains);
- The responsibilities and reporting requirements for any individual discovering a spill or fire; and
- The locations of emergency response equipment, spill response instructions and emergency contact telephone numbers.

A summary of the fuel handling and spill contingency instructions will be posted in the Contractors site trailer.

The following page shall be copied and used for this purpose.

SPILL CONTINGENCY PLAN

Rocklin Street, Burke Village Promenade, and Gislason Avenue Extension Project.

Access is gained using the existing paved surfaces of Burke Village Promenade east of Mitchell Street or Gislason Avenue east, Coquitlam BC.

The fuel is hauled in a truck (likely 10,000-L). The fuel supply company is to be determined by contractor.

To Prevent Spills:

Maintain vehicles regularly; repair leaks;

Inspect fuel tanks regularly;

When transferring fuel:

- Secure valve before and after fueling;
- Do not leave pump unattended;
- **NO SMOKING** while fueling;
- Do not grease machine while fueling; and
- Use 20-litre pail to drain pump hose after use.

Emergency Response:

1. In the event of any spill, contact **Ryan Preston (ENKON Environmental Limited) – 604-805-7262** as soon as possible.

2. If this is not immediately possible, follow any or all of the following as appropriate:

- Stop any further leakage;
- Contain fuel to prevent its reaching a creek or wetland – trench or berm;
- Make a temporary dam, if necessary – use booms or logs on the creek;
- Use the spill kit absorbent pads to clean up the spill; and
- Recover the product or saturated absorbent pads in the empty drums marked “SPILL RECOVERY”.

Call Provincial Emergency Program hot line 1-800-663-3456

10.0 SPILL CONTINGENCY PLAN

10.1 Purpose

The objectives of the Spill Contingency Plan are to:

- Minimize the health and safety risks to construction workers and the general public from spills of combustible or other hazardous materials; and
- Minimize the environmental effects of spills on water or land.

In order to achieve these objectives, the Spill Contingency Plan

- Defines the reporting procedure and communications network to be used in the event of a spill.
- Identifies specific individuals and their responsibilities in a spill response situation.
- Defines procedures for the containment and clean-up of the spills.
- Provides an inventory of equipment and material that could be used to safely contain a spill of gasoline, diesel fuel or toxic material.
- Provides a list of contacts through which additional equipment and resources could be obtained for a spill response.

10.2 Pre-Emergency Planning

10.2.1 Legislation and Industry Standards

The following provincial and federal legislation and industry standards are applicable to hazardous materials and spill management at the water main construction sites:

- *Transportation of Dangerous Goods Act* - Designates thousands of products, including fuel, as dangerous goods. Sets out transportation and handling rules to be followed by shippers;
- *Fisheries Act* - Prohibits deposits of deleterious substances into fish-bearing waters and watercourses that discharge into fish-bearing waters;
- *Canadian Environmental Protection Act* - Provides for regulations governing pollution prevention;

- *Environmental Management Act, Spill Reporting Regulation* – Defines types and quantities of spilled materials that must be reported to the Provincial Emergency Program;
- *Environmental Management Act, Hazardous Waste Regulation* – Applies to the management of special wastes, including used oil;
- *Environmental Management Act, Contaminated Sites Regulation* – Defines a contaminated site. Lists responsibilities and exemptions related spill cleanup;
- *BC Fire Code* – Regulates portable containers, highway tanks and bulk storage for flammable liquids, including gasoline. Provides for other handling and safety features such as hoses and nozzle valves, overflow protection devises, absorbents for flammable and combustible liquids. Incorporates provisions of the *National Fire Code of Canada*;
- Canadian Council of Ministers of Environment Environmental Code of Practice for Aboveground Storage Tanks Containing Petroleum Products (1994) – Provides comprehensive specifications for tanks, piping, and containment;
- A Field Guide to Fuel Handling, Transportation & Storage, 3rd Edition (BC Ministry of Water, Land and Air Protection 2002);
- *Land Development Guidelines for the Protection of Aquatic Habitat* – Includes guidelines for control of hazardous substances on the development site.

10.2.2 Emergency Organization and Responsibilities

The Contractors Site Superintendent will have on-site authority and control over any environmental incidents that occur during the construction activities. The site superintendent will have the authority to mobilize on-site personnel to respond to an environmental incident as necessary.

The responsibilities of all individuals involved in the spill response will be to:

Individual Discovering Incident

- Assess the initial severity of the spill and any safety and environmental concerns;
- Identify the source of the spill;
- Report all spills to the Site Superintendent as soon as possible;
- Stop or contain the spill, if possible and safe to do so;
- Participate in spill response as member of cleanup crew;

Site Superintendent or Project Coordinator

- Assess and verify the initial severity of the spill and safety and environmental concerns;
- Gather, collect and confirm information on the spill – source, type, size, cause, etc.;
- Notify the Spill Response Supervisor, Spill Response Team and the Project Manager;
- Conduct initial containment and cleanup operations in concert with the Spill Response Team;

Spill Response Team

- Conduct cleanup of spills under direction of the Contractor's Spill Response Supervisor;
- Deploy booms, absorbents and other equipment and materials as required;
- Take appropriate response measures;
- Continue cleanup as directed by the Spill Response Supervisor or until relieved;

Spill Response Supervisor

- Supervise the spill response team;
- Assist in initial and ongoing response efforts;
- With work crew, take initial action to seal off the source and contain spill;
- Decide with Project Manager and Environmental Monitor if mobilization of additional equipment from a spill response organization or contractor is warranted;
- Ensure co-ordination of equipment and manpower as needed;
- Ensure expeditious response and clean-up of the spill site and any other impacted areas;
- Record any information required to complete the Environmental Incident Report (see Section 10.3.6);
- Oversee completion and distribution of the Environmental Incident Report;
- Take action, as necessary, to prevent a recurrence;

Project Manager

- Notify the Environmental Monitor and the City of Coquitlam representative and contact City of Coquitlam 24/7 customer service line *(604)-927-3500 24 hours a day/7 days a week).*
- Ensure that the spill is reported to the Provincial Emergency Program (PEP) 24-Hour Spill Report Line and obtain confirmation of receipt of the Spill Report;
- Record the time of the spill, source of information and details on location, size, type of spill and any other information required to complete the Spill Report (see Appendix A);
- Oversee the cleanup operation until it is satisfactorily completed;
- Provide cleanup advice to the Spill Response Supervisor ;
- Together with the Spill Response Supervisor and Environmental Monitor decide if additional equipment is required to contain and clean up spills;
- Contact Environment Canada's emergency response team, if the situation requires;
- Notify the Engineering Consultant and City of Coquitlam representative ;
- Ensure that the Environmental Incident Report is received and that the report or any subsequent investigation identifies measures to prevent similar spills;
- Ensure that actions are taken, as necessary, to prevent a recurrence;

Environmental Monitor

- Together with the Project Manager and the Spill Response Supervisor decide if additional equipment is required to contain and clean up spills;
- Provide advice on storage, disposal and/or remediation options for used absorbent pads, recovered product and contaminated soil;
- Record any information required for reporting to government agencies such as Department of Fisheries and Oceans;
- Liaise with government agencies (as required);
- Ensure that follow up reports on the spill event, clean up and environmental impacts are prepared and submitted to the appropriate government agencies (e.g., Ministry of Environment, DFO).

Transport Companies

Spills that occur during transportation of materials to the site will be the responsibility of the transportation company.

10.2.3 Resources

Locally available personnel and emergency services that can be contacted to assist or may need to be notified in the event of an emergency are presented in Table 5.

10.2.4 Communications

10.2.4.1General

Environmental incident reporting is required for the following reasons:

- To maintain legislative compliance;
- To share information within the company to prevent a reoccurrence;
- To provide educational resource information;
- To promote and maintain awareness;
- To provide documentation for review, analysis, corrective measures and due diligence requirements.

Table 5 - Local Emergency Response Resources and Contact Information

Resource	Contact #
City of Coquitlam – Engineering Department 24/7 Hotline.	604-927-3500
Environmental Consultant (ENKON) Ryan Preston	604-574-4477 ext 105(office) 604-805-7262 (cell)
Environmental Monitors Leandre Tan	604-710-4521 (cell)
Provincial Emergency Program	1-800-663-3456
City of Coquitlam Fire Department	911
Police	
Ambulance	
Environment Canada 24-hour Hotline	604-666-6100
Fisheries and Oceans Canada 24-hour Hotline	604-666-3500

10.2.4.2 Environmental Incident Categories

There are essentially two types of environmental incident reporting categories, which include:

- Significant spills that that must be reported to the appropriate environmental agencies under legislative requirements; and
- Incidents that are not serious in nature but have a hazard potential and are reported to the Project Manager, ISL Engineering Ltd., Environmental Consultant, and City of Coquitlam representative.

10.2.4.3 Internal Alerting

Environmental incidents will normally be investigated by the Project Manager in consultation with the Environmental Consultant. For spills, any on-site release greater than 1 liter should be reported in accordance with the communication protocols below.

Any releases to storm sewers, regardless of quantity, must be reported in accordance with the communication protocol.

Environmental incidents will be documented in an Environmental Incident Report. The report must describe the cause of incident and sequential events leading up to the incident.

When an environmental incident occurs, the following notification procedures will be implemented as follows:

- The employee noticing the incident will **immediately** notify the Site Superintendent.
- The Site Superintendent will **immediately** notify the Contractor's Spill Response Supervisor, Spill Response Team and the Project Manager.
- The Project Manager will notify the Environmental Monitor and the City of Coquitlam representative.
- The Spill Response Supervisor in consultation with the Project Manager and the Environmental Monitor will immediately implement spill containment procedures outlined in Section 10.3.
- For spills reportable in the *Spill Reporting Regulation*, the Project Manager in consultation with the Environmental Monitor will contact the Provincial Emergency Program at 1-800-663-3456.

- If BC Ministry of Environment and/or Environment Canada and Fisheries and Oceans Canada must be contacted, this will be done by the Project Manager in consultation with the Environmental Monitor.
- Subsequent notification of the City of Coquitlam Representative will be done by the Project Manager.
- An Environmental Incident Report must be submitted by the responsible Site Superintendent to the Project Manager within three days of the incident (see Section 11.3.6).

10.2.4.4 External Alerting

Depending on the type of emergency, government authorities may have to be notified of the incident within a specific period. The Project Manager in consultation with the Environmental Monitor will contact the Provincial Emergency Program at 1-800-663-3456 for spills reportable in the *Spill Reporting Regulation*.

Table 4 contains a list of the reportable quantities of the substances that will be stored or used onsite. This table can be for quick reference to assist the Project Manager and Environmental Monitor in determining whether a release is reportable or not.

Spills of the magnitude shown in Table 6 also must be reported to Transport Canada if the spill occurs during transportation, unloading the transport vehicle or storing the goods after unloading. This notification may be done by contacting the local police (604-599-0502).

Regardless of the amount spilled, if the spill enters a fish-bearing watercourse, or there is a potential for environmental impact, then Fisheries and Oceans Canada (DFO) and/or Environment Canada must be contacted (see Table 5 for contact telephone numbers). Environment Canada also may be contacted to assist with a spill that it is too large for local resources to handle. As indicated above, the Project Manager, in consultation with the Environmental Monitor, will be responsible for reporting environmental incidents to the appropriate authorities.

Table 6 - Quantities of Spills Requiring Notification

Hazardous Material	TDG Classification	Specified Amount
Oil, Waste Oil	Flammable liquids of Class 3	100 liters
Gasoline	Flammable liquids of Class 3	100 liters
Diesel	Flammable liquids of Class 3	100 liters

10.3 Emergency Response

10.3.1 Response Action Decision

There are three levels of emergencies that potentially could occur during construction as follows:

- Level 1 – a minor spill requiring onsite personnel to respond and take necessary actions;
- Level 2 – an intermediate spill requiring response by onsite or offsite trained personnel but posing minimal or no danger to the public or environment;
- Level 3 - a major incident beyond the resources of a single facility, where there are secondary problems to complicate the situation such as fire, explosion, toxic compounds, and threat to life, property and the environment. Assistance will be required from local, regional, and/or provincial organizations.

Given the quantities of materials to be utilized on-site during construction and the nature of the construction activities, most emergencies likely would be categorized as Level 1.

10.3.2 Plan Activation and Response Mobilization

The spill contingency plan will be activated as soon as a spill occurs or is discovered. The person who causes or discovers the spill will take the following actions:

- PROTECT human health and safety. Eliminate ignition sources. Warn other people and evacuate the area, if necessary.
- IDENTIFY the spilled product and potential dangers, if possible.
- STOP the flow, if it safe to do so. Plug leaks, upright drums, fully close valves or take similar steps that can be done quickly and safely;
- REPORT the spill to the Site Superintendent

The Site Superintendent will report the incident to the Spill Response Team and Project Manager. The Project Manager or Environmental Monitor will contact the Provincial Emergency Program at 1-800-663-3456 for spills reportable in the Spill Reporting Regulation (See Appendix A for required reporting information).

The Spill Response Team will:

- ASSESS the situation to determine:
  - Is there a risk of fire or explosion?

- Is containment possible?
- What can be done right away to protect people and the environment?
- What kind of equipment is needed?
- RESPOND using appropriate materials and methods for the type and location of the spill.

10.3.3 Response Action/Containment/Cleanup

10.3.3.1 Emergency Equipment

The following emergency equipment will be available for use in responding to a spill or fire:

- Spill kits containing absorbent pads; and
- Fire extinguishers.

Spill kits and fire extinguishers will be stored at the storage area and in site vehicles. The spill station/spill containment kits will be restocked to replace all items that are used during any spill response.

10.3.3.2 Response Actions

The response actions will depend upon the material spilled and the location of the spill. The following section provides response actions for specific situations. Further instructions for spill responses can be found in the Material Safety Data Sheets (MSDS), which will be kept in a binder with this spill response plan.

Fuels and Oils

- Contain the spill as close to the release site as possible. Prevent the spill from reaching drainage ditches/swales or storm drains.
- Construct an earth dam or dig recovery ditches down gradient of the spill (and pits within the spill area) to contain the spill.
- Monitor the ditches and pits to ensure the collection system are effective.
- Use absorbent pads to remove free product immediately. If there is not enough absorbent, check around for natural absorbents. Straw, leaves or moss can be very effective.
- For large spills, pump the product from the containment area or obtain approval from BC MOE to burn the product (unlikely for this project).

- In hot weather where there is a danger of fire or explosion, do not contain a gasoline spill – allow it to disperse and evaporate.
- Excavate the contaminated soil.
- Sample the soil to determine the extent of contamination.

10.3.4 Disposal of Spilled Contaminants and Debris

Clean up operations will vary depending on the situation and circumstances but generally consist of:

- Transferring recovered spilled material and used absorbents into tanks or drums;
- Extracting and transferring contaminated soil and/or water into tanks or drums;
- Placing damaged drums or containers in overpacks;
- Labelling drums, tanks and overpacks;
- Confirming disposal options and approval with BC MOE;
- Using a licensed hauler/disposal agency with the required waybills to transfer hazardous waste to a disposal/treatment facility.

10.3.5 Site Restoration and Remediation

Following a large spill of petroleum products, a site investigation might be required to find out the extent of contamination and how best to clean it up. The BC *Contaminated Sites Regulation* specifies the way in which hydrocarbon contamination is to be assessed and the level of contamination allowed in soil and water. The assessment must include:

- A review of the incident to determine where, what and how much was released;
- A field program to collect samples of soil or groundwater to determine the extent and effect of the contamination; and
- Preparation of a remediation plan. For Level 3 incidents, the restoration plan would likely be prepared in consultation between the Contractor and the government regulatory agency with primary responsibility in that situation. The plan would then have to be carried out and verified.

The most common method of cleaning up hydrocarbon contaminated sites is by removing the contaminated soil and treating it either on-site or at a treatment facility. The soil could be treated on-site or by land farming. In this method, the contaminated soil is spread onto an impermeable layer and the hydrocarbons are allowed to break down into harmless components through volatilization, evaporation, and bacterial action.

Alternatively, the soil may be treated in place by soil venting with the addition of bacterial nutrients.

If groundwater were contaminated, it would be necessary to install wells to remove the hydrocarbons from the groundwater.

After the remediation was complete, sampling would be required to verify that the site was clean. The results would need to be properly documented and kept on file.

10.3.6 Post-Incident Evaluation

The Site Superintendent will prepare a written Environmental Incident Report and submit it to the Project Manager within three days of the incident. If applicable, photographs of affected areas should be taken and submitted with the report. Additional information required includes:

- Date of report
- Date and time of incident
- Name of company responsible for spill
- Address and phone number
- Contact name and position
- Name of product/substance that was spilled or released (refer to MSDS)
- Total quantity involved
- Quantity spilled
- Location of spill
- Cause of spill
- What was affected by the spill
- A description of how the spill was contained
- Corrective measures taken to complete operations (include clean up, packaging, storing and disposal information)
- Date and time of clean up completion
- Weather conditions during clean-up operations
- Recommendations to prevent reoccurrence
- Notifications made

- Injury report information
- Name of the Spill Response Supervisor
- Name of the Environmental Monitor
- Name of reporting Site Superintendent

The normal distribution of environmental incident reports will be as follows:

- One copy to the Project Manager;
- One copy for the Environmental Monitor;
- One copy for the City of Coquitlam Representative.

10.4 Training and Practice

The Contractor shall train employees in emergency response procedures and plan and carry out drills.

10.5 Plan Evaluation

The Spill Response Supervisor, Project Manager, Engineering Consultant, Environmental Consultant and City of Coquitlam representative will evaluate the effectiveness of the Spill Contingency Plan as part of the preparation and review of any Environmental Incident Reports.

10.6 Plan Updates

The spill contingency plan will be updated to include recommendations for improvements arising from any Environmental Incident Reports.

11.0 SOLID WASTE MANAGEMENT PLAN

A Solid Waste Management Plan must be prepared by the Contractor to maximize the reuse and recycling of materials generated as a result of the construction activities. Existing waste materials within the worksite (i.e. car parts, garbage, concrete debris) should be removed from the work area prior to completing rough grading and implementation of ESC measures.

Waste materials generated from use of construction materials, supplies, and tree clearing activities should also be sorted and recycled, where possible.

To avoid attractants for wildlife within the project area management of all other wastes, particularly food products, must ensure proper disposal or storage in sealed containers.

Table 7 summarizes the handling of the major types of solid waste expected.

Table 7 - Solid Waste Management Plan

Material	Disposal Method	Handling Procedure	Waste Hauler/ Approved Disposal Location
Concrete and Asphalt	Recycle	Break up any wastes or mistakes and put in concrete/asphalt bin.	Columbia Bitulithic (Coquitlam)
Wood Pallets (Dunnage Material)	Return to delivery company	Store at site office for pick-up	Pipe supplier
Wood waste/hog fuel	Recycle/Reuse	Retain nominal amounts onsite for beneficial ESC purposes Export via truck	Haul offsite to recycling dumpsite or reuse site (i.e. farms)
All other wastes	Landfill	Dispose of in trash dumpster	

The Solid Waste Management Plan must include a communication plan, which contains the following elements:

- Waste prevention and recycling activities will be discussed at the beginning of each safety meeting. Employees will be instructed on distinguishing recyclables, solid waste and hazardous waste.
- When a new employee comes on-site, the Contractor will present him/her with a copy of the Solid Waste Management Plan and provide a tour of the recycling areas/facilities.
- All recycling containers will be clearly labelled.
- Lists of acceptable/unacceptable materials will be posted throughout the site.
- Employees, subcontractors and site visitors will be prohibited from littering.

12.0 OTHER MANAGEMENT PLANS

12.1 Fugitive Dust Control Plan

Dust emissions can be generated from tree clearing and associated earthworks and hauling activities.

Dependent on project timing and seasonal weather conditions, fugitive dust concerns may be significant. In the event that dry conditions yield dust concerns, the following summaries typical dust-producing sources which may require mitigation:

- Site preparation – falling, grubbing, and rough-grading of the road alignments.
- General construction – vehicle movements; material storage and handling, offsite hauling of logs and debris.

To minimize potential impacts from fugitive dust, the Contractor shall implement a Fugitive Dust Control Plan. The Plan is as follows:

1. Dry materials, temporary soil storage piles and rubbish will be covered or wetted down to prevent blowing dust and debris.
2. To the extent possible potential dust-generating activities s will be avoided during windy periods.
3. The Site Manager (or a delegate) will conduct regular visual inspections of the site perimeter to check for dust deposition on vegetation, cars and other objects. Remedial action will be taken, if necessary.
4. Trucks removing demolition debris from the site will have their loads securely covered.
5. Disturbed areas will be stabilized via temporary covers or final seeding per ESC plan specifications as quickly as possible.

12.2 Noise Control Plan

The Contractor will comply with the City of Coquitlam's *Noise Bylaw No. 1233, 1982*, which limits construction to 0700 hours to 2200 hours from Monday through Saturday and further restricts construction activities on Saturday.

Construction is not permitted at any time on Sunday or any statutory holiday.

Except as specified in a variance permit, which may be obtained to allow generators to run through the night (which may be required to facilitate streamflow bypass and worksite isolation), the Contractor will not work outside these hours without with the written approval of the City.

To minimize the noise at the construction site, the Contractor will service all equipment regularly to ensure that it functions at the rated noise level.

12.3 Fire Prevention and Control

Fires and burning of wastes are not permitted for the purposes of the Princeton Ave. and Mitchell Street road construction project.

Smoking shall be permitted only in designated areas. Due to dangers related to fire, the Contractor's site trailer or a designated location shall be equipped with required fire season equipment:

- (1) 18 liter backpack or hand tank;
- (1) Chemical extinguisher;
- (1) fire shovel; and
- (1) Pulaski.

APPENDIX A

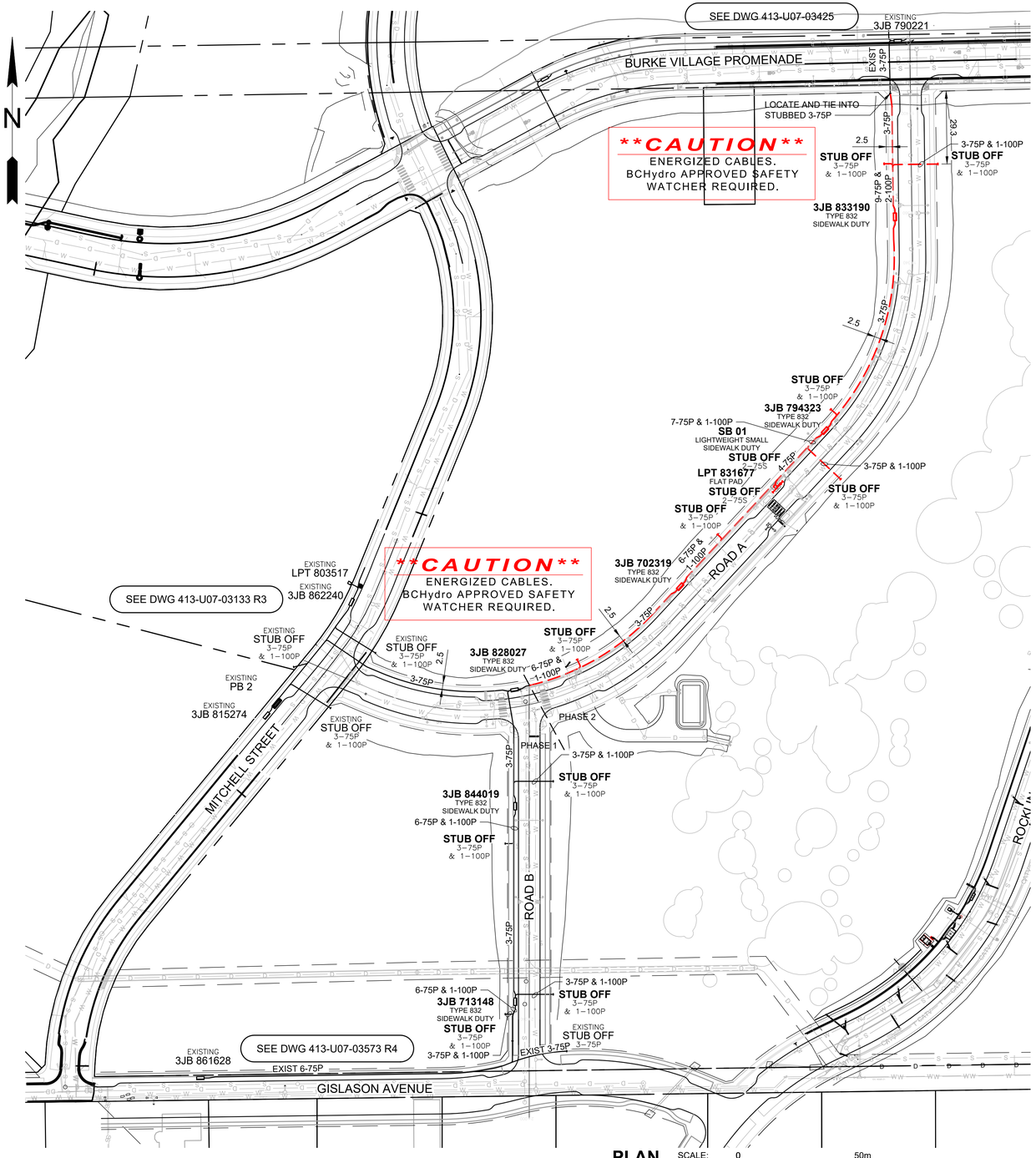
Spill Reporting Information Requirements

Project Name:	Lower Burke Roads Construction			
Incident Date	YYYY-MM-DD:		HH:MM	
Form Completed by:			Phone:	
			Email:	
Responsible Person:			Phone:	
			Email:	
Owner of Substance Spilled				

Spill Details				
Location & Site of Spill:	Description:			
	UTM Easting:		UTM Northing:	
Source of Spill:				
Type & Quantity of Spill:				
Description of Circumstances				
Receiving Environment	Land	☐ - Soil ☐ - Pavement ☐ - Land ☐ - Gravel ☐ - Other	Water	☐ - Natural Stream ☐ - Ditch ☐ - Storm Sewer ☐ - Other
Actions Taken:				
Proposed Actions:				
Agencies at Spill Site:				
Agencies Advised of Spill				

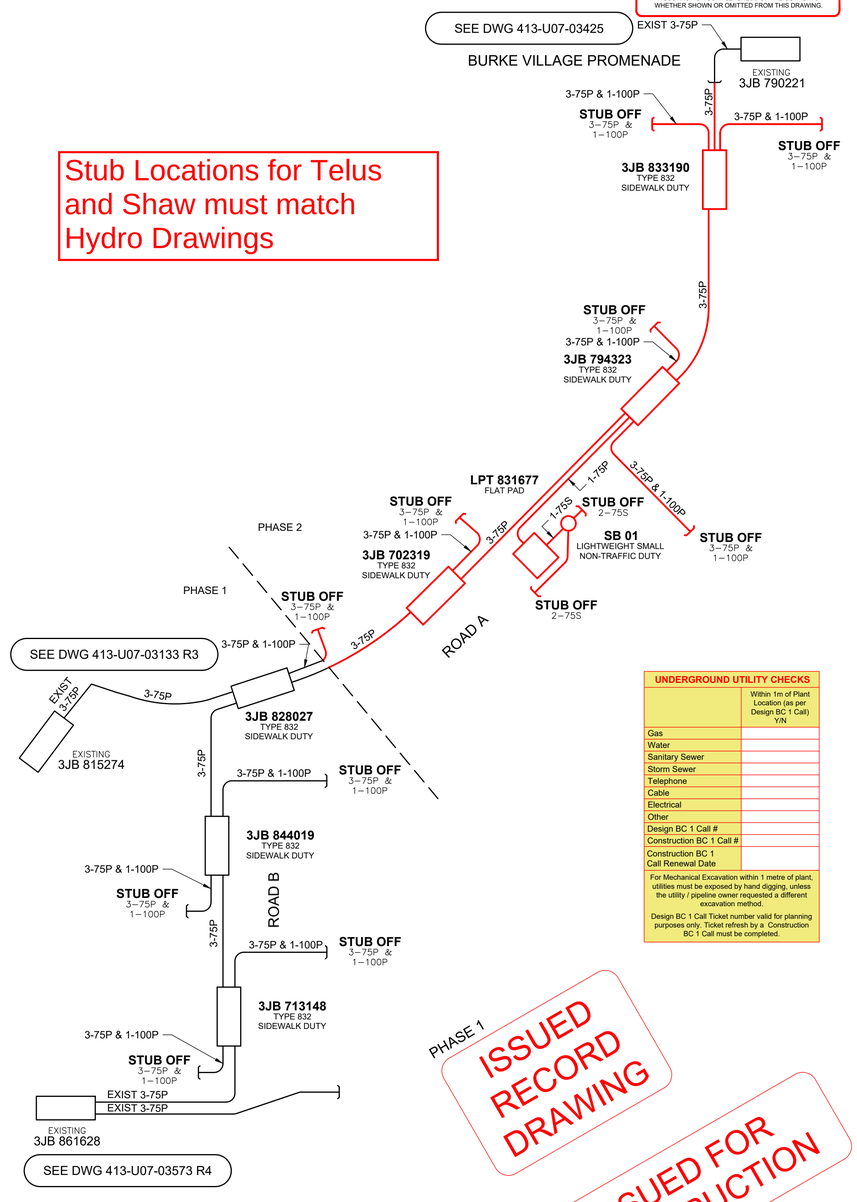
Appendix C -

BC Hydro, Telus & Shaw Drawings



PLAN SCALE: 1:1000 0 50m

Stub Locations for Telus and Shaw must match Hydro Drawings



CIVIL ONE-LINE DIAGRAM
N.T.S

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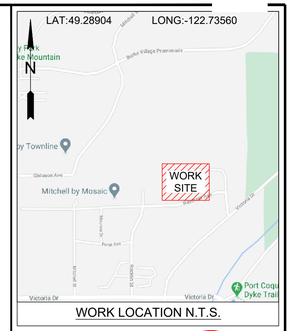

WORK LOCATION N.T.S.

BC ONE CALL

CALL BEFORE YOU DIG
1-800-474-6886

CALL AT LEAST 3 FULL WORKING DAYS BEFORE YOU PLAN TO DIG

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UNDERGROUND UTILITY CHECKS	Within 1m of Plant Location (as per Design BC 1 Call) Y/N
Gas	
Water	
Sanitary Sewer	
Storm Sewer	
Telephone	
Cable	
Electrical	
Other	
Design BC 1 Call #	
Construction BC 1 Call #	
Construction BC 1 Call Renewal Date	

For Mechanical Excavation within 1 metre of plant, utilities must be exposed by hand digging, unless the utility / pipeline owner requested a different excavation method.

Design BC 1 Call Ticket number valid for planning purposes only. Ticket refresh by a `Construction BC 1 Call must be completed.

CUSTOM NOTES HERE IF REQUIRED

PHASE 1

ISSUED RECORD DRAWING

ISSUED FOR CONSTRUCTION

CIVIL PLAN LEGEND:

BC HYDRO RESPONSIBILITY		CUSTOMER RESPONSIBILITY
	NEW DUCT	
	EXISTING DUCT	
	FIELD COMPLETED DUCT	
	SERVICE BOX	
	TERMINAL POLE	
	LOW PROFILE TRANSFORMER (LPT-PYRAMID PAD)	
	LOW PROFILE TRANSFORMER (LPT)	
	PAD MOUNT TRANSFORMER (PMT)	
	3Ø & 1Ø JUNCTION & PULL BOXES (332, 632, 832 & 1232)	
	PRECAST MANHOLE	
	VISTA SWITCH SUBMERSIBLE (VSWB)	
	VISTA SWITCH ABOVE GROUND (VSWA)	

REFER TO ES53 AND ES54 UNDERGROUND STANDARDS

REFERENCE DRAWINGS

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DESIGN NUMBER	0004340665	DSGN	S.OKILJ
WORK ORDER NUMBER	02067929	INDEP CHK	
CSA S250 ACCURACY NAD 83 - 10UTM		DFTG	M.ZOU
		DFTG CHK	A.KIMBER
BASE ACCURACY LEVEL: 4 +/- 1000 mm		INSP	
		REV	
ASB ACCURACY LEVEL: 4 +/- 1000 mm		ACPT	

BC Hydro

LMN -COQUITLAM - MAPLE RIDGE
COQUITLAM DISTRICT OFFICE
UNDERGROUND DUCT AND STRUCTURES FOR LOWER BURKE VILLAGE ROADS
3561 GISLASON AVENUE, COQUITLAM
SHEET 1 OF 3

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIGURE NUMBER	SIZE	REV
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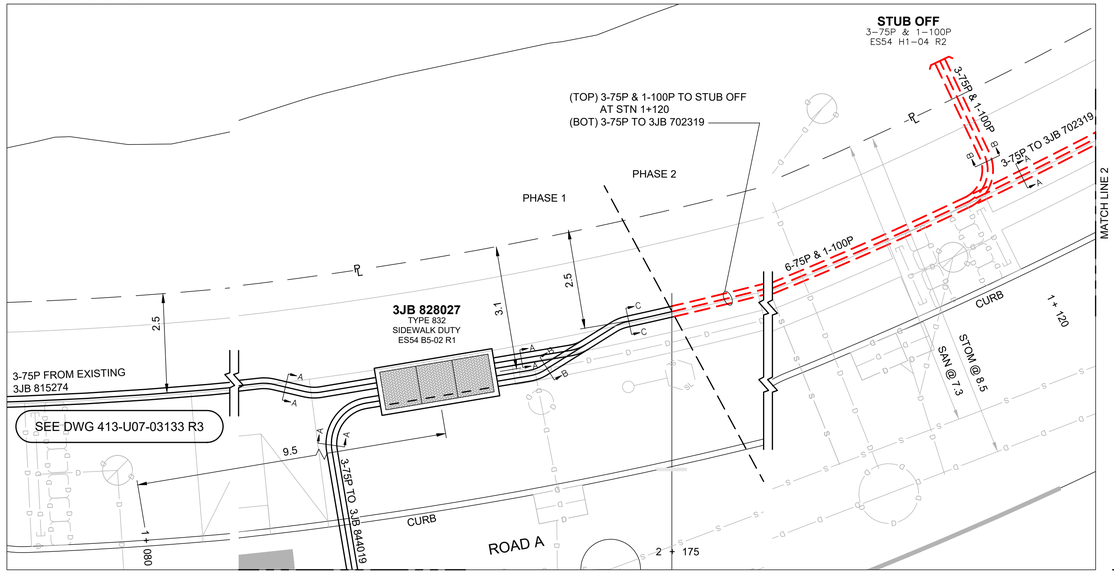

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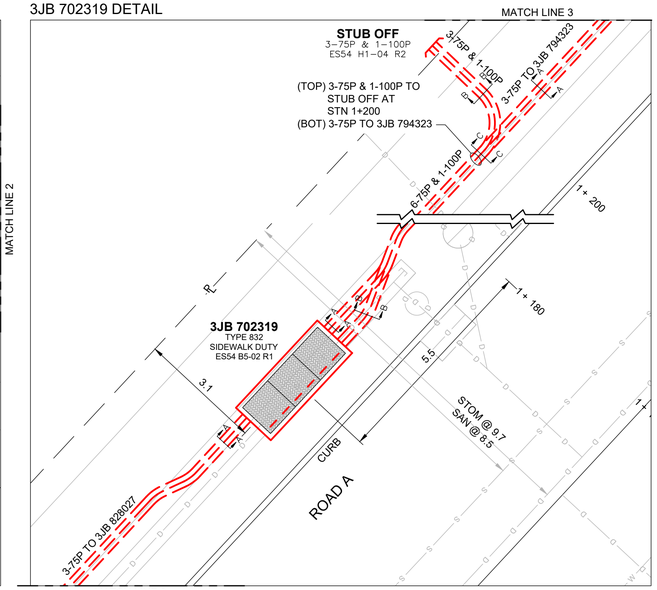

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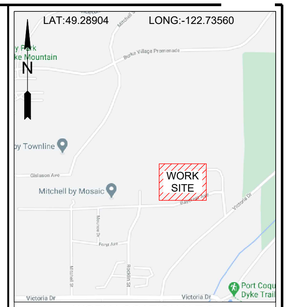

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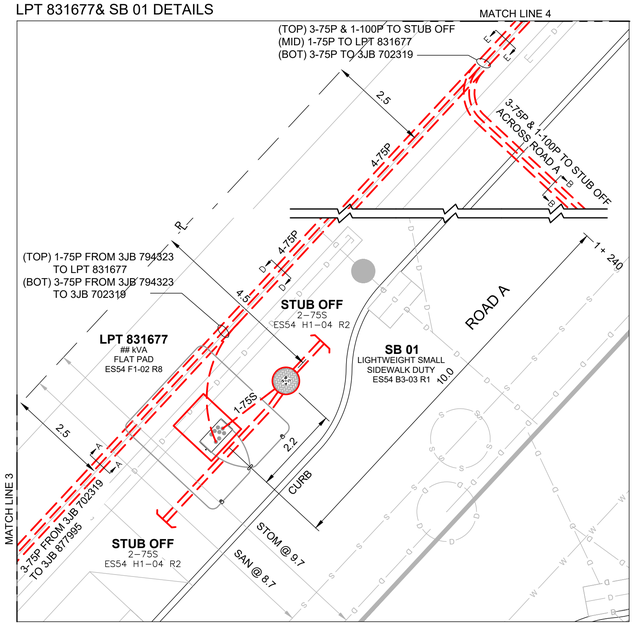
LPT 831677& SB 01 DETAILS



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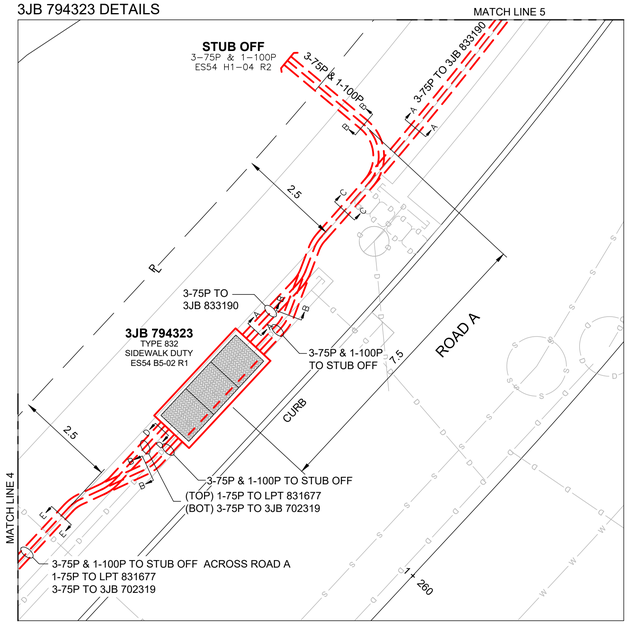

SEE DWG 413-U07-03425

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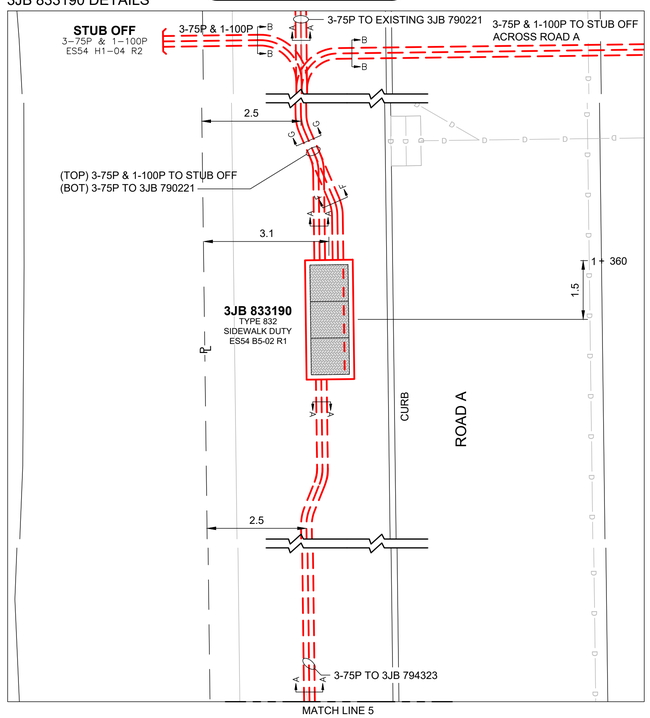

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	SERVICE BOX	
	TERMINAL POLE	
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	LOW PROFILE TRANSFORMER (LPT)	
	PAD MOUNT TRANSFORMER (PMT)	
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	PRECAST MANHOLE	
	VISTA SWITCH SUBMERSIBLE (VSWB)	
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REFER TO ES53 AND ES54 UNDERGROUND STANDARDS

DETAILS
N.T.S

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REVISIONS	

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		DFTG CHK	A.KIMBER
BASE ACCURACY LEVEL: 4 +/- 1000 mm		INSP	
		REV	
ASB ACCURACY LEVEL: 4 +/- 1000 mm		ACPT	

BC Hydro

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LOWER BURKE VILLAGE ROADS
3561 GISLASON AVENUE, COQUITLAM
SHEET 2 OF 3

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIGURE NUMBER	SIZE	REV
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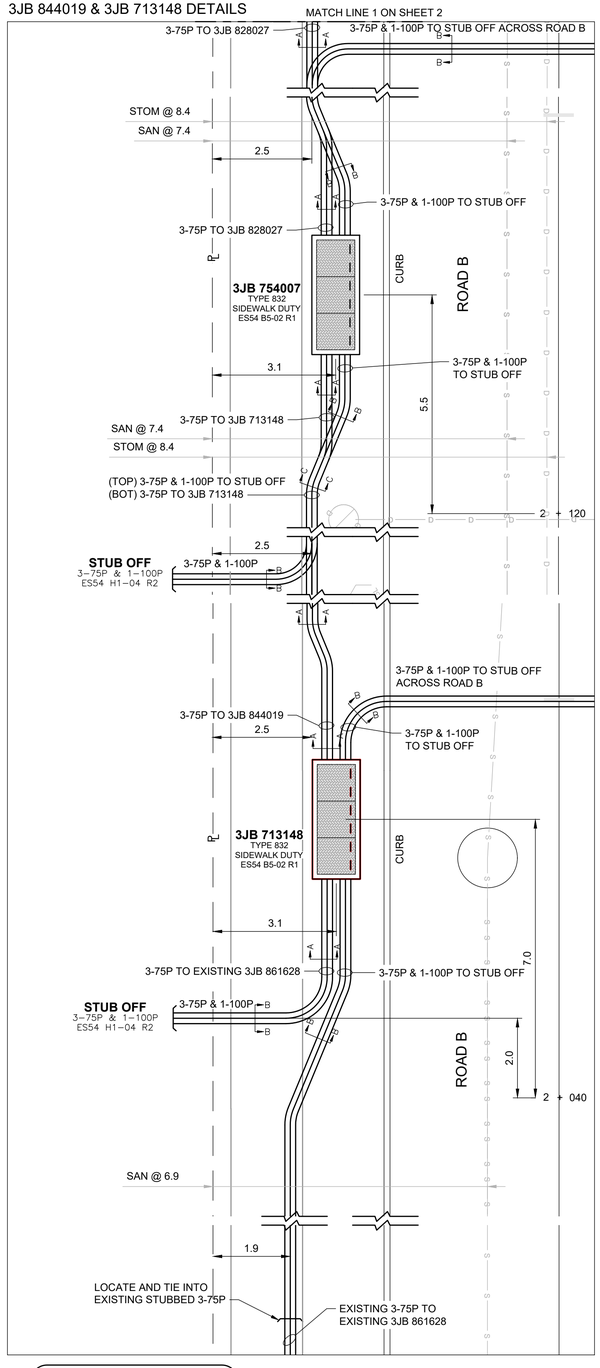
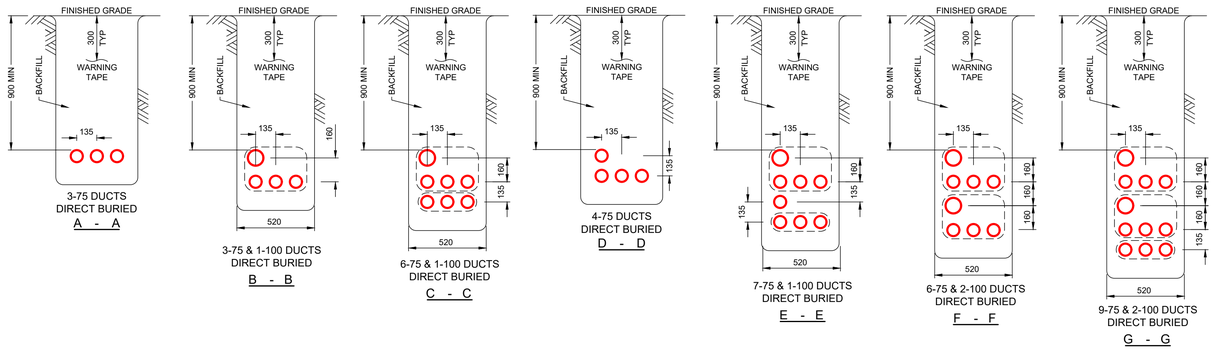


SEE DWG 413-U07-03573 R4 **DETAILS**
N.T.S



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6-75 & 1-100 DUCTS DIRECT BURIED C - C

4-75 DUCTS DIRECT BURIED D - D

7-75 & 1-100 DUCTS DIRECT BURIED E - E

6-75 & 2-100 DUCTS DIRECT BURIED F - F

9-75 & 2-100 DUCTS DIRECT BURIED G - G

TRENCH DETAILS
N.T.S

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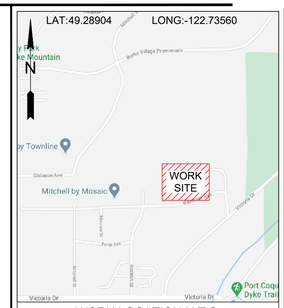

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		REV	
ASB ACCURACY LEVEL: 4 +/- 1000 mm		ACPT	

BC Hydro

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SHEET 3 OF 3

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIGURE NUMBER	SIZE	REV
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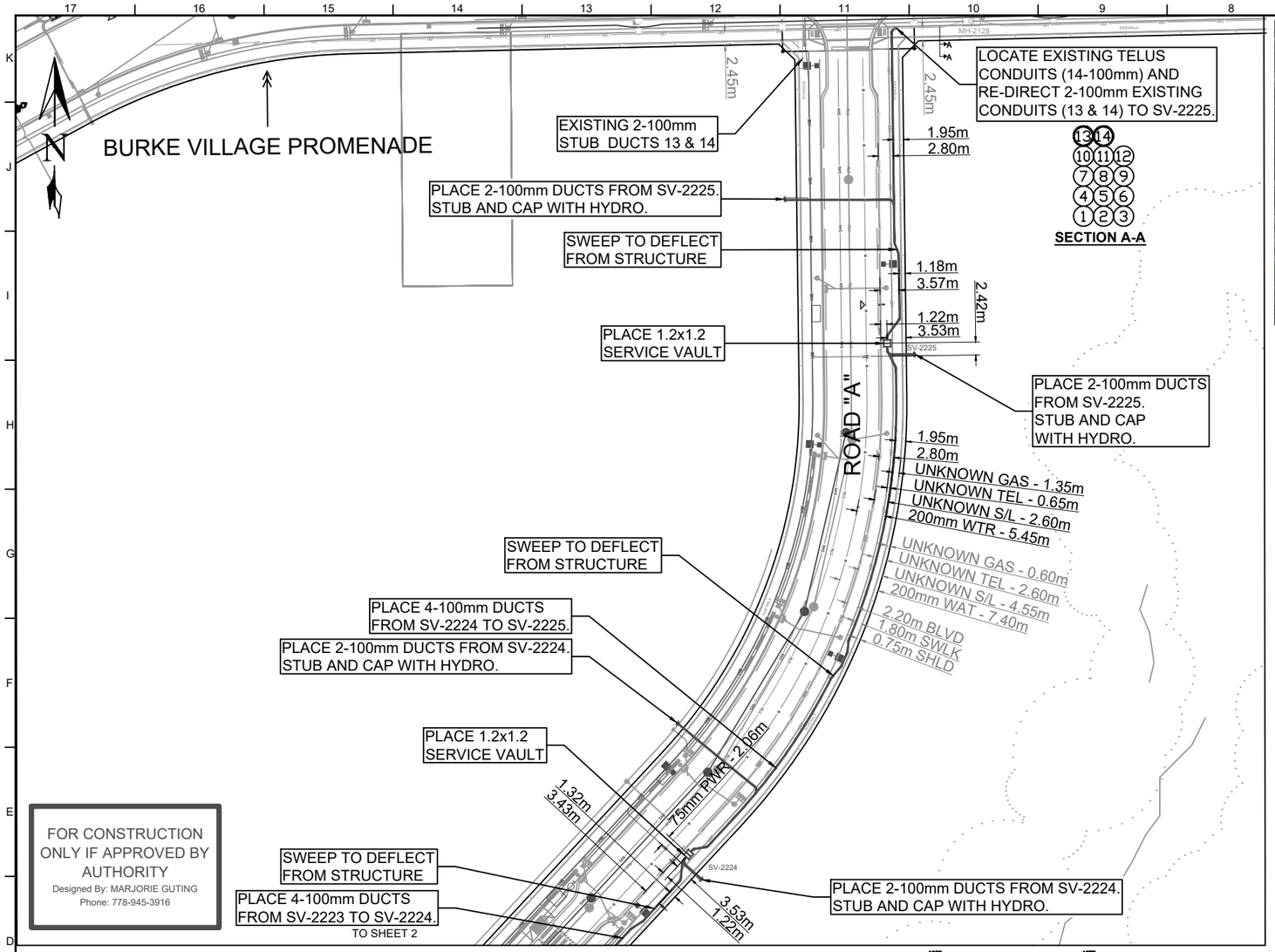
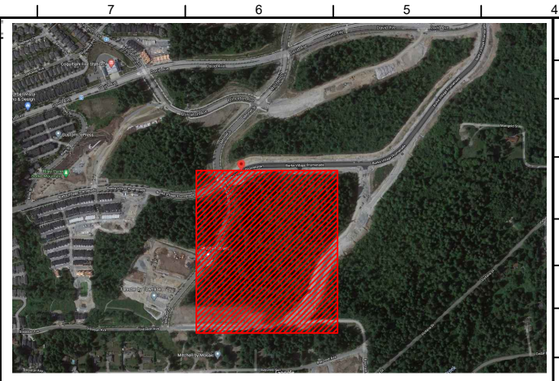




LOCATION MAP

LEGEND

- PROPOSED SERVICE BOX / FDH
- PROPOSED MANHOLE
- PROPOSED SERVICE VAULT
- PROPOSED PEDESTAL
- PROPOSED CONDUIT (OPEN TRENCH)
- PROPOSED CONDUIT (DIRECTIONAL DRILL)
- PROPOSED DROP CONDUIT
- WATER MAIN
- SEWER MAIN
- SANITARY MAIN
- STORM MAIN
- GAS MAIN
- TEL DUCTS
- CATV DUCTS
- POWER DUCTS
- PIPELINE
- STREETLIGHT
- ABANDONED UTILITY
- EDGE OF PAVEMENT
- BACK OF CURB
- POLE (W/ ANCHOR)

CONSTRUCTION NOTES:

ISSUE:

	1. ELEVATIONS REFER TO _____ DATUM.
	2. CONDUIT GRADE ON PROFILE IS APPROXIMATE ONLY. FINISHED GRADE WILL BE SUBJECT TO LOCATION OF EXISTING UNDERGROUND UTILITIES.
X	3. MINIMUM COVER CONDUIT **0.91m** ALL SECTIONS EXCEPT WHERE OTHERWISE NOTED. MANHOLE ROOF **0.46m**
X	4. ALL DUCTS TO BE 100mm P.V.C. DB II (ORANGE) UNLESS OTHERWISE NOTED.
X	5. ALL MANUFACTURED BENDS TO BE **0.91m** RADIUS UNLESS OTHERWISE NOTED.
	6. ALL CONCRETE PILASTERS TO BE **0.30m** ABOVE GRADE UNLESS OTHERWISE NOTED.
X	7. CONTRACTOR IS TO PROVE THE LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES AND SERVICES AFFECTED BY CONSTRUCTION BY M-SCOPE, HAND EXCAVATION OR BC ONE CALL.
X	8. FOR CABLE TROUBLE OR REPAIR INFORMATION, CONTACT TELUS AT 611.
X	9. TEMPORARY/PERMANENT RESTORATION IN ALL PAVED/SIDEWALK AREAS TO BE DONE IN ACCORDANCE WITH ALL APPROVING AUTHORITIES SPECIFICATIONS AND APPROVAL.
X	10. PERMANENT SIDEWALK AND CURB REPAIRS TO BE DONE BY **CONTRACTOR** . PERMANENT ROAD REPAIRS TO BE DONE BY **CONTRACTOR** .
X	11. PERMANENT BOULEVARD RESTORATION TO BE DONE BY CONTRACTOR.
X	12. ALL LANDSCAPE RESTORATION IN LAWN BOULEVARDS MUST BE DONE BY USING SUITABLE GRASS SOD.
X	13. CONTRACTOR TO CONTACT THE APPROPRIATE GAS COMPANY RECORDS DEPARTMENT 24 HOURS PRIOR TO STARTING WORK.
X	14. CONTRACTOR TO CONTACT THE CITY/MUNICIPAL WORKS INSPECTOR 48 HOURS PRIOR TO STARTING WORK.
X	15. CONTRACTOR TO CALL BC ONE CALL (FOR BC) OR AB ONE CALL (FOR ALBERTA) 48 HOURS PRIOR TO DIGGING.
X	16. ALL BACKFILL MATERIAL AND COMPACTION TO BE IN ACCORDANCE WITH ALL APPROVING AUTHORITIES SPECIFICATIONS.
X	17. ALL DIRECT BURIED SYSTEMS 2-WAY AND LARGER TO BE BUNDLED AND STRAPPED.
	18. TELUS CONTRACTOR TO SUPPLY AND PLACE AN ENCLOSED PLYWOOD BOX OVER SAC PAD DUCTS AND SECURED TO FRAME.
	19. BREAK OUT EXISTING CONCRETE ENCASED DUCTS: ANY JACK-HAMMERING OR USE OF POWER TOOLS TO BE CARRIED OUT BY CONTRACTOR. ALL HAND STRIPPING OF DUCTS, BREAKING OF DUCTS AND/OR HANDLING OF CABLES TO BE DONE BY TELUS FORCES.
	20. EXISTING CONDUIT TO BE RELOCATED IF REQUIRED TO ENSURE SPECIFIED ENTRANCE LOCATIONS INTO MANHOLE/VAULT. CONTRACTOR TO PROVIDE EXCAVATION, BACK-FILLING AND RESTORATION IF RELOCATION BECOMES NECESSARY.
X	21. ORANGE TELUS MARKER TAPE TO BE PLACED ON CENTERLINE OF DUCT BANK @ 300mm BELOW FINAL GRADE.
X	22. CONTACT TELUS 10 DAYS BEFORE PROJECT START TO ARRANGE PICKUP LOCATION OF TELUS SUPPLIED MATERIAL. BC: KATHY MIDWOOD (Kathy.Midwood@Telus.com) at 604-453-2037
X	23. SUBGRADE & DIRECT BURIED MATERIAL WHERE APPLICABLE SHALL BE 20mm MINUS CRUSHED AGGREGATE.
X	24. BACKFILL MATERIAL SHALL BE: IN ROADWAYS/TRAVELLED AREAS **20mm MINUS** IN SIDEWALK/TRAVELLED AREAS **20mm MINUS** IN BOULEVARD/UNTRAVELLED AREAS **20mm MINUS**
X	25. CONTRACTOR TO PULL IN A TELUS SUPPLIED MEASURING TAPE THRU ONE DUCT IN EACH RUN AFTER MANDRELLING, LOCATION TO BE DETERMINED BY TELUS.
	26. MINIMUM SEPARATION FROM ALL UTILITIES TO BE 300mm.
X	27. ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED

ONECALL TICKET NO: 20210608087

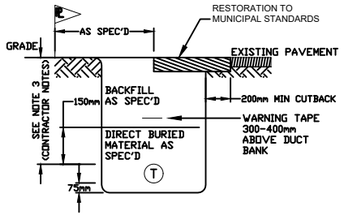
FOR CONSTRUCTION ONLY IF APPROVED BY AUTHORITY
Designed By: MARJORIE GUTING
Phone: 778-945-3916

CONTACT KATHY MIDWOOD AT Kathy.Midwood@telus.com FOR MATERIALS AND CONDUIT INSPECTION (BC ONLY)

TOTAL ESTIMATED PUBLIC CIVIL DISTANCE (m)	750m
TOTAL ESTIMATED PRIVATE CIVIL DISTANCE (m)	0
TOTAL ESTIMATED PUBLIC CABLE PLACING (m)	0
TOTAL ESTIMATED PRIVATE CABLE PLACING (m)	0
# OF PROPOSED STRUCTURES	7
# LOTS	UNKNOWN

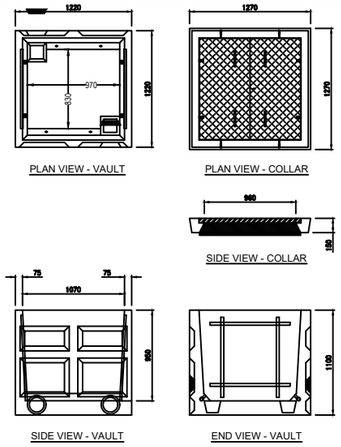
HYDROVAC DISPOSAL CONSTRUCTION NOTE:

ALL HYDROVAC SLURRY MUST BE PROPERLY DISPOSED AT A PROVINCIALLY APPROVED FACILITY. RECORD KEEPING, INCLUDING THE HYDROVAC OPERATOR NAME, DATE, LOCATION WHERE THE MATERIAL WAS EXTRACTED AND DISPOSED AND AMOUNT AND CONTENT OF SLURRY, MUST BE MAINTAINED AND MADE AVAILABLE ON REQUEST.



TYPICAL TRENCH BACKFILL DETAILS

N.T.S.



1.2x1.2 SV DETAIL

N.T.S.

CITY OF COQUITLAM
Engineering & Public Works

NOT APPROVED UNLESS SIGNED

Approval does not confirm the accuracy of the design. The city does not accept responsibility for any costs or damages incurred due to errors, deficiencies or omissions in the design.

On behalf of the Manager of Capital Projects & Inspections

03/11/2021

Date

REVISIONS							
REV	DATE	DESCRIPTION	DES	DFT	CHK	APP
0	2021-03-01	ISSUED FOR CONSTRUCTION	MG	MG	JB	JB

CONTACT INFORMATION
DES: MARJORIE GUTING
PH: 778-945-3916
EMAIL: MARJORIE.GUTING@LEDCOR.COM
APPROVED:
DATE:
AS CONSTRUCTED DATE:
CONTRACTOR:

PREPARED BY:
IN PARTNERSHIP WITH:

BC ONE CALL
CALL BEFORE YOU DIG 1-800-464-6886 OR BY CELLULAR *6886 VANCOUVER AREA 257-1940
CALL AT LEAST 2 FULL DAYS BEFORE YOU PLAN TO DIG
CONSTRUCTION NOTE:
- ALL EXISTING UTILITIES TO BE LOCATED PRIOR TO CONSTRUCTION
- CONTACT LTS ENGINEERING FOR CHANGES TO THE APPROVED DRAWING. (LTSTELUSBAUDESIGN@LEDCOR.COM)

REFERENCE DRAWINGS
LOWER_BURKE_REDLINE
LOWER BURKE VILLAGE ROADS

TELUS BAU: 5080640 BC GROWTH AND SUSTAINMENT
C.O. CODE WSWD
UNDERGROUND CONSTRUCTION TO SERVICE ROAD A & B BURKE VILLAGE COQUITLAM, B.C.
LOWER BURKE VILLAGE - CITY OF COQUITLAM
REVISION: 0
2799450U
1:1000 (m)
0 10 20 30 40
SHEET: 1
TOTAL SHEETS: 2
SIZE: 11X17
DATE: 2021-03-01

DWG A1

TPU 5

TO SHEET 1

PLACE 2-100mm DUCTS FROM SV-2223.
STUB AND CAP WITH HYDRO.

PLACE 4-100mm DUCTS
FROM SV-2223 TO SV-2224.

PLACE 1.2x1.2
SERVICE VAULT

SWEEP TO DEFLECT
FROM STRUCTURE

PLACE 1.2x1.2
SERVICE VAULT

PLACE 2-100mm DUCTS FROM SV-2221.
STUB AND CAP APPROXIMATELY 5m
FROM SV-2221 FOR FUTURE USE.

PLACE 3-100mm DUCTS
FROM SV-2221 TO SV-2222.

PLACE 4-100mm DUCTS
FROM SV-2222 TO SV-2223.

PLACE 2-100mm DUCTS FROM SV-2222.
STUB AND CAP WITH HYDRO.

PLACE 1.2x1.2
SERVICE VAULT

SWEEP TO DEFLECT
FROM STRUCTURE

PHASE 2

PLACE 2-100mm DUCTS FROM SV-2223.
STUB AND CAP WITH HYDRO.

LOCATE EXISTING 2-100mm TELUS CONDUITS
AND CONNECT TO PROPOSED SV-2221.

SWEEP TO DEFLECT
FROM STRUCTURE

PHASE 1

PLACE 4-100mm DUCTS
FROM SV-2220 TO SV-2222.

PLACE 2-100mm DUCTS FROM SV-2220.
STUB AND CAP WITH HYDRO.

PLACE 1.2x1.2
SERVICE VAULT

PLACE 2-100mm DUCTS FROM SV-2220.
STUB AND CAP WITH HYDRO.

PLACE 4-100mm DUCTS
FROM SV-2219 TO SV-2220.

SWEEP TO DEFLECT
FROM STRUCTURE

PLACE 1.2x1.2
SERVICE VAULT

PLACE 2-100mm DUCTS FROM SV-2219.
STUB AND CAP WITH HYDRO.

LOCATE EXISTING 3-100mm TELUS CONDUITS
AND CONNECT TO PROPOSED SV-2219.
STUB OUT THE PROPOSED CONDUITS IF
EXISTING 3-100mm ARE STILL INCOMPLETE
AT THE TIME OF CONSTRUCTION. REFER TO
NETWORK 2761495 FOR MORE INFORMATION.

PLACE 2-100mm DUCTS FROM SV-2219.
STUB AND CAP WITH HYDRO.

Stub Locations for Telus and Shaw must match Hydro Drawings

Phase 1 Works Complete

MITCHELL ST.

ROAD "A"

ROAD "B"

(UNNAMED ROAD)

ROCKLIN ST.

GISLASON AVE.

GISLASON AVE.

MH-2056

SV-2221

SV-2222

SV-2220

SV-2219

75mm PWR - 1.85m

1.95m
2.80m
3.53m
1.22m

1.95m
2.80m
UNKNOWN GAS - 1.35m
UNKNOWN TEL - 0.65m
UNKNOWN S/L - 2.60m
200mm WTR - 5.45m

UNKNOWN GAS - 0.60m
UNKNOWN TEL - 2.60m
UNKNOWN S/L - 4.55m
200mm WAT - 7.40m

0.75m SHLD
1.80m SWLK
2.20m BLVD

2.35m
2.77m
3.55m

0.98m
3.32m
2.14m

200mm WTR - 5.45m
UNKNOWN S/L - 2.60m
UNKNOWN TEL - 0.65m
UNKNOWN GAS - 1.35m
2.80m
1.99m

UNKNOWN GAS - 0.60m
UNKNOWN TEL - 2.60m
UNKNOWN S/L - 4.55m
200mm WTR - 7.40m

0.75m SHLD
1.80m SWLK
2.20m BLVD

12m

75mm PWR - 3.23m

200mm WTR - 4.05m
UNKNOWN GAS - 1.35m
UNKNOWN S/L - 2.30m

3.05m
1.40m

200mm WAT - 6.00m
UNKNOWN S/L - 4.25m
UNKNOWN GAS - 0.60m

0.45m SHLD
1.80m SWLK
2.20m BLVD

1.95m
2.50m

200mm WTR - 4.05m
UNKNOWN GAS - 1.35m
UNKNOWN S/L - 2.30m

1.40m
3.05m
1.95m
2.50m
1.80m

11.76m
10.00m

FOR CONSTRUCTION
ONLY IF APPROVED BY
AUTHORITY
Designed By: MARJORIE GUTING
Phone: 778-945-3916

CITY OF COQUITLAM
Engineering & Public Works

NOT APPROVED UNLESS SIGNED

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On behalf of the Manager of Capital Projects & Inspections

03/11/2021

Date

REVISIONS						
REV	DATE	DESCRIPTION	DES	DFT	CHK	APP
0	2021-03-01	ISSUED FOR CONSTRUCTION	MG	MG	JB	JB

CONTACT INFORMATION
DES: MARJORIE GUTING
PH: 778-945-3916
EMAIL: MARJORIE.GUTING@LEDCOR.COM
APPROVED:
DATE:
AS CONSTRUCTED DATE:
CONTRACTOR:

PREPARED BY:

IN PARTNERSHIP WITH:

BC ONE CALL
CALL BEFORE YOU DIG
1-800-464-6886
OR BY CELLULAR *6886
VANCOUVER AREA 257-1940
CALL AT LEAST 2 FULL DAYS
BEFORE YOU PLAN TO DIG

CONSTRUCTION NOTE:
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- CONTACT LTS ENGINEERING FOR CHANGES TO THE APPROVED DRAWING. (LTSTELUSBAUDESIGN@LEDCOR.COM)

REFERENCE DRAWINGS
LOWER_BURKE_REDLINE
LOWER BURKE VILLAGE ROADS

TELUS BAU: 5080640 BC GROWTH AND SUSTAINMENT

C.O. CODE WSWD

UNDERGROUND CONSTRUCTION TO SERVICE ROAD A & B BURKE VILLAGE COQUITLAM, B.C.
LOWER BURKE VILLAGE - CITY OF COQUITLAM

REVISION: 0

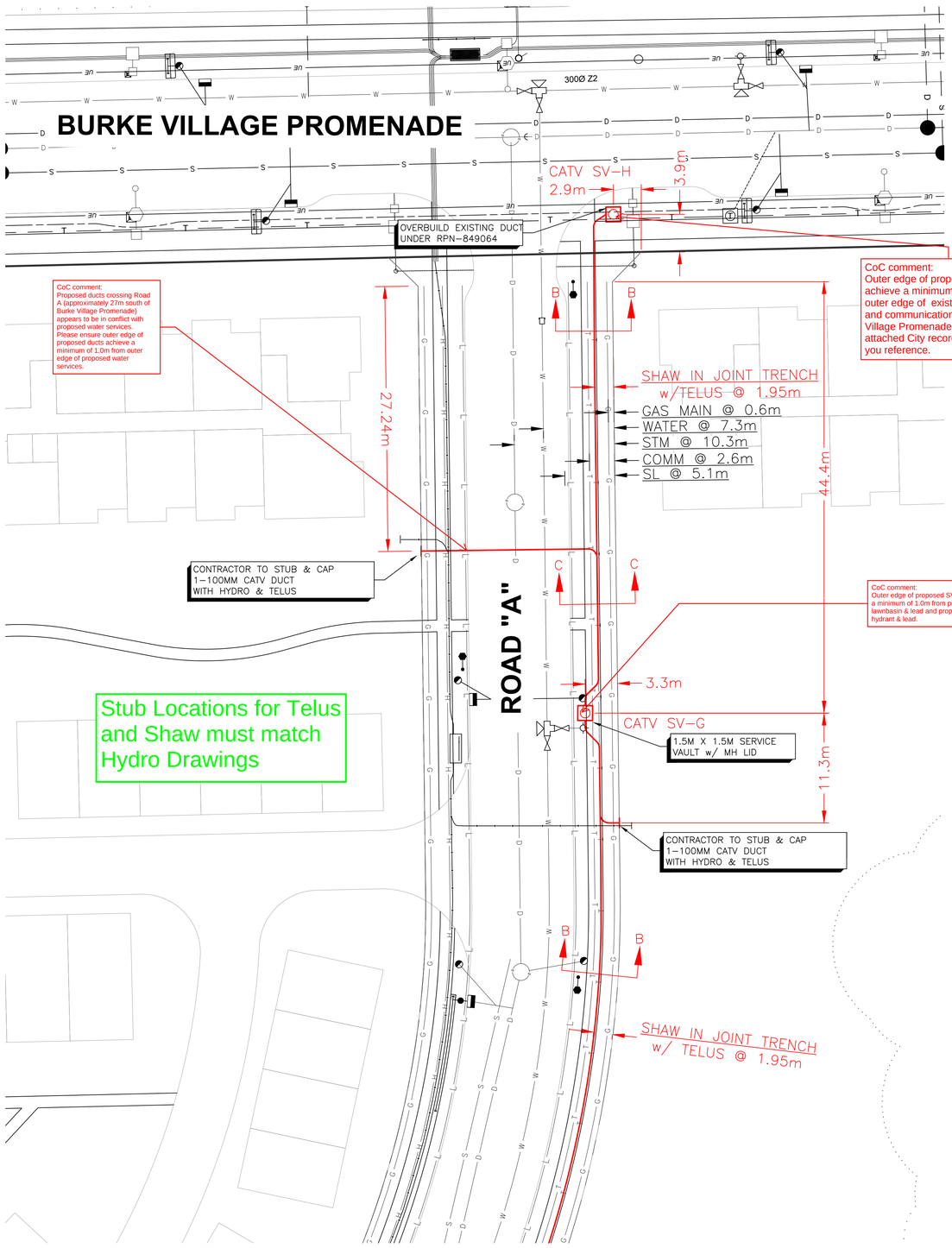
2799450U

1:1000 (m)
0 10 20 30 40

SHEET: 2
TOTAL SHEETS: 2
SIZE: 11X17

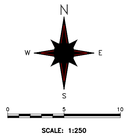
DATE: 2021-03-01

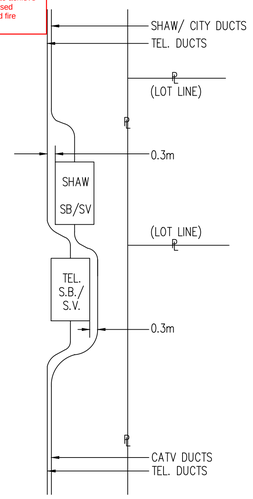
DWG A1



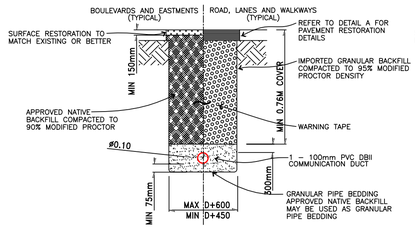
PROPOSED SHAW DUCT ALIGNMENT-SHEET 1

SEE SHEET 2

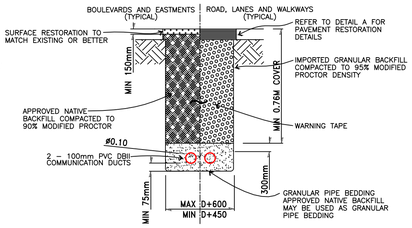




TYPICAL JOINT TRENCH
PLAN DETAILS
– NTS –



TYPICAL TRENCH DETAIL
SECTION A-A
SCALE: N.T.S.



TYPICAL TRENCH DETAIL
SECTION B-B
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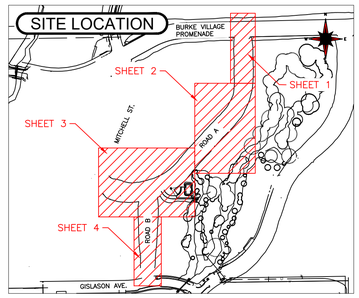
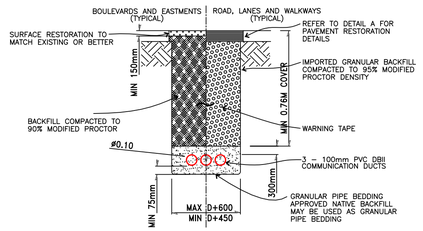


LOCATION PLAN
SCALE: N.T.S.



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SECTION C-C
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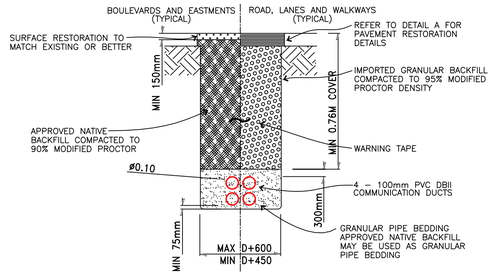
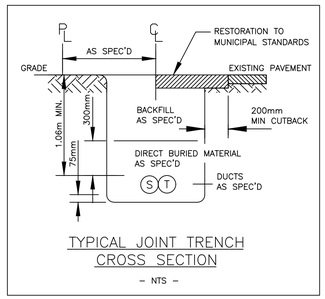
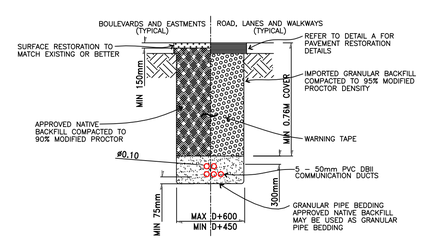


TYPICAL TRENCH DETAIL
SECTION D - D
SCALE: N.T.S.



TYPICAL JOINT TRENCH
CROSS SECTION
– NTS –



TYPICAL TRENCH DETAIL
SECTION E-E
SCALE: N.T.S.

CONSTRUCTION NOTES:

ALL SHAW CATV DUCTS TO RUN IN COMMON TRENCH WITH BC HYDRO DUCTS UNLESS OTHERWISE NOTED.

SHAW REQUIRES:

A. A PRE-CONSTRUCTION MEETING WITH THE CIVIL CONTRACTOR TO ADDRESS CONSTRUCTION RELATED QUESTIONS
B. AN INSPECTION ONCE THE CATV DUCTS ARE PLACED, PRIOR TO BACKFILL PLACING
C. A FINAL INSPECTION

FOR INSPECTIONS PLEASE EMAIL:
PROJECTMANAGERVANCOUVER@SJRB.CA

THE CONTRACTOR IS TO REQUEST OFFSITE CATV MATERIALS FROM SHAW A MINIMUM OF TEN (10) BUSINESS DAYS PRIOR TO CONSTRUCTION START. MATERIALS CAN BE COLLECTED FROM ICONIX AND AE CONCRETE WITH PICK NUMBERS RPN- XXXXXX

LEGEND

PROPOSED CATV DUCT	
EXISTING CATV DUCT	
EXISTING TELUS DUCT	T
EXISTING HYDRO DUCT	H
EXISTING GAS	G
EXISTING WATER	W
EXISTING SANITARY SEWER	S
EXISTING STORM SEWER	D
EXISTING STREET LIGHTING	L
EXISTING CURB	
SIDEWALK	
PROPOSED CATV SERVICE VAULT	
PROPOSED CATV SERVICE VAULT	
PROPOSED CATV SERVICE BOX	
PROPOSED CATV PEDESTAL	
EXISTING CATV SERVICE VAULT	
EXISTING CATV SERVICE BOX	
EXISTING CATV PEDESTAL	
TELUS MANHOLE	
TELUS SERVICE VAULT	
TELUS SERVICE BOX	
POWER/TEL POLE	
TRANSFORMER	
JUNCTION BOX	
HYDRO SERVICE BOX	
GAS VALVE	
WATER VALVE	
FIRE HYDRANT	
WATER SV	
CATCH BASIN	
MANHOLE	
LAMP AND POLE	
STREET LIGHT	
ORNAMENTAL STREET LIGHT	
SIGN/PARKING METER	

UPON COMPLETION OF SHAW CIVIL BUILD
CONTACT ***shaw-inspections@encepta.net***
FOR FINAL INSPECTION

TELUS INSPECTOR NOTIFIED 48HRS PRIOR TO CONSTRUCTION
COMPANY
CONTRACTOR
SIGNATURE
DATE

SHAW DUCT IDENTIFICATION TAGS INSTALLED
COMPANY
CONTRACTOR
SIGNATURE
DATE

CONSTRUCTION NOTE:
A SITE INSPECTION MUST BE COMPLETED BY TELUS FOR ALL BREAKOUTS/INCURSIONS INTO TELUS STRUCTURES (SUCH AS SHAW PEDESTALS, SHAW OWNED DUCT ETC.)
CONTACT KATHY MIDWOOD AT TELUS (604-453-2037) 48 HOURS PRIOR TO CONSTRUCTION TO ARRANGE INSPECTION.
CREWS MUST SIGN OFF BELOW AFTER CONTACTING TELUS.
Completed by: (NAME) & (COMPANY) Date:

SUBMIT FOR CATV PERMIT
MUNICIPALITY
APPROVED
APPROVING OFFICER
DATE

CITY OF COQUITLAM
Engineering & Public Works
NOT APPROVED UNLESS SIGNED
Approval does not confirm the accuracy of the design. The city does not accept responsibility for any costs or damages incurred due to errors, deficiencies or omissions in the design.
On behalf of the Manager of Capital Projects & Inspections
11/18/2022
Date

CONSTRUCTION NOTES

1. MINIMUM CONDUIT COVER 1.0m ALL SECTIONS, EXCEPT WHERE OTHERWISE NOTED.
2. ALL DUCTS TO BE 100mm P.V.C. DB 11 UNLESS OTHERWISE NOTED.
3. ALL MANUFACTURED BENDS TO BE 0.9m RADIUS UNLESS OTHERWISE NOTED.
4. ALL CONCRETE PILASTERS TO BE 200mm ABOVE GRADE UNLESS OTHERWISE NOTED.
5. CONTRACTOR IS TO PROVE THE LOCATIONS OF ALL EXISTING U/G UTILITIES AND SERVICES AFFECTED BY CONSTRUCTION.
6. CONTRACTOR TO CONTACT THE APPROPRIATE FORTISBC RECORDS DEPARTMENT 48 HRS. PRIOR TO STARTING WORK.
7. ALL BACKFILL MATERIAL AND COMPACTION TO BE IN ACCORDANCE WITH THE APPROVING AUTHORITIES' SPECIFICATIONS.
8. ORANGE MARKER TAPE TO BE PLACED IN TRENCH LINE, 300mm ABOVE DUCTS.
9. ALL TRENCHES COMMON TO ALL POWER AND COMMUNICATIONS DUCTS TO BE 300mm OTHER MATERIAL OR 75mm CONCRETE SEPARATION.
10. ALL PROPOSED MANHOLES AND SERVICE VAULTS TO BE INSTALLED A MINIMUM OF 1.0m BELOW THE CROWN OF ADJACENT ROAD.
11. CONTRACTOR MUST CONTACT A TELUS INSPECTOR 48 HRS. PRIOR TO CONNECTING TO TELUS FACILITIES.
12. PLACE 10mm BRAIDED NYLON CORD IN ALL MAINWAY AND SERVICE DUCTS.
13. WHERE FIBREGLASS SERVICE BOXES ARE USED, CONTRACTOR TO USE A SILICON BASED CAULKING TO SEAL DUCT ENTRY INTO BOX.
14. SHAW CABLESYSTEMS PROJECTMANAGERVANCOUVER@SJRB.CA

CAUTION! BURIED CABLES
CALL DIG SHAW TO LOCATE

Dig Shaw
Call 1-866-DIGSHAW or visit digshaw.ca before you dig.

Shaw)
SHAW TOWER
900-1067 W CORDOVA ST.
VANCOUVER, B.C.
V6C 3T5

Issue	Date	Initials	
A	16/03/21	CT	ISSUE FOR APPROVAL

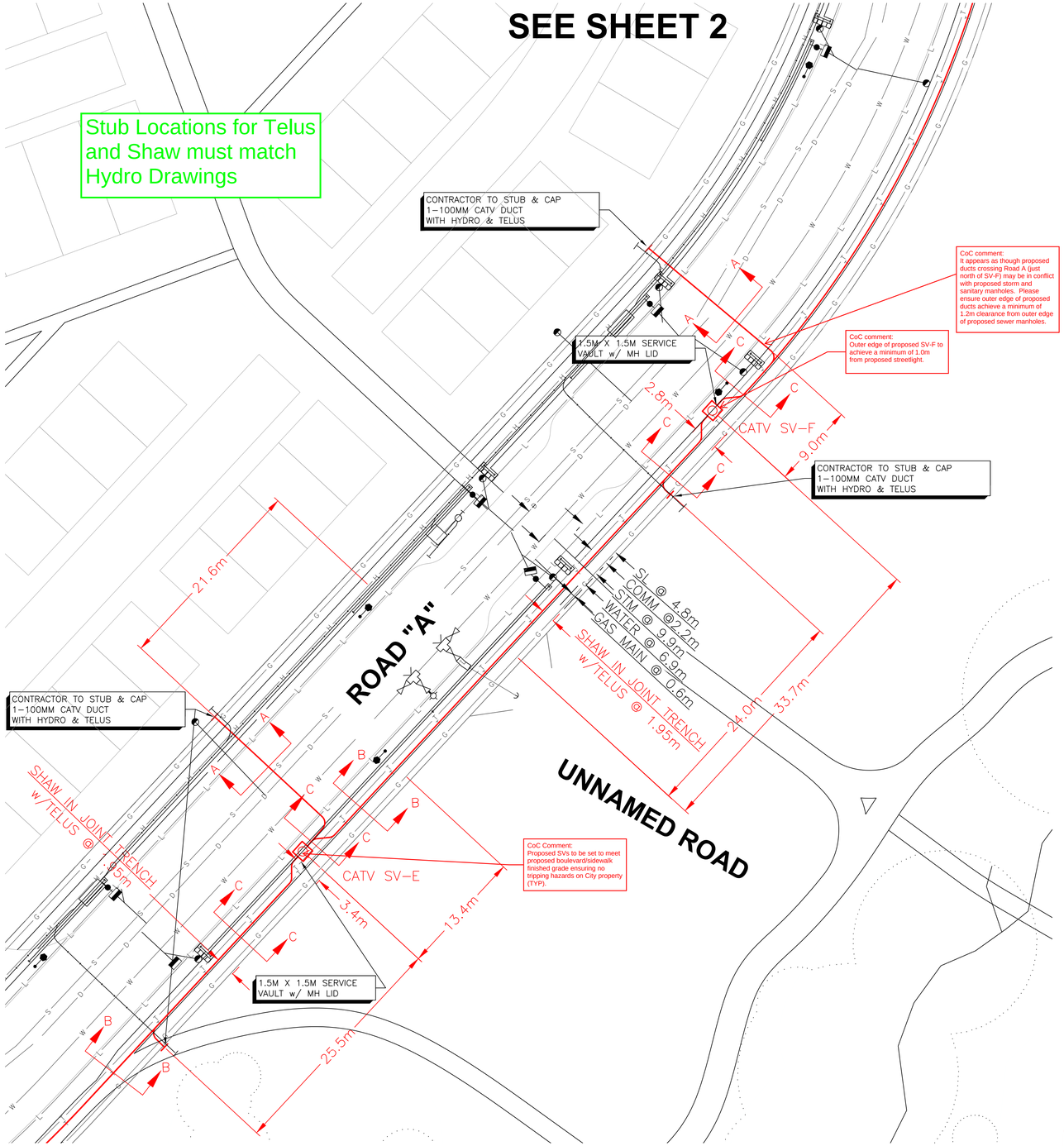
Designed By: N.DAVID
Drafted By: C.TRINH
Date: 03/03/21
Document Type: SERVICE BOX AND DUCT INSTALLATION DETAILS

Project: CONDUIT CONSTRUCTION TO SERVICE ROAD SERVICE A & B
Location: LOWER BURKE VILLAGE COQUITLAM, B.C.

Scale: 1:250
Project No: RPN-255924
Drawing No: (PER-1124613)
Sheet: 1 OF 4
Revision: A

SEE SHEET 2

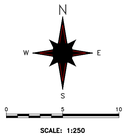
Stub Locations for Telus and Shaw must match Hydro Drawings

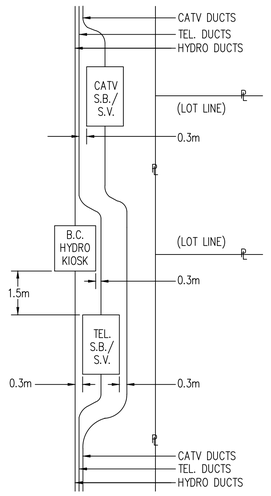


SHAW SERVICE BOXES/VAULTS ARE NOT TO BE PLACED ON SIDEWALKS OR DRIVEWAYS

PROPOSED SHAW DUCT ALIGNMENT-SHEET 2

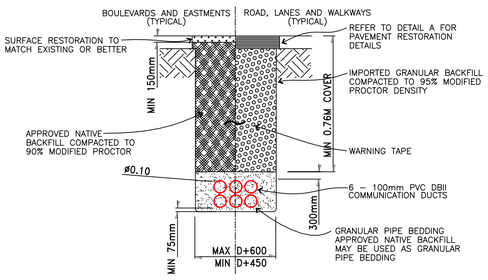
SEE SHEET 3





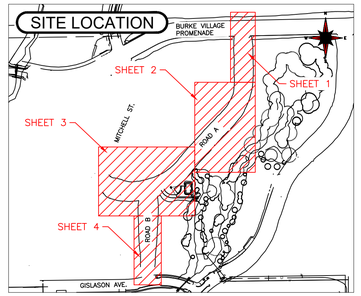
TYPICAL JOINT TRENCH PLAN DETAILS

– NTS –



TYPICAL TRENCH DETAIL
SECTION F - F

SCALE: N.T.S.



LOCATION PLAN

SCALE: N.T.S.

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C. A FINAL INSPECTION

FOR INSPECTIONS PLEASE EMAIL:
PROJECTMANAGERVANCOUVER@SJRB.CA

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CITY OF COQUITLAM
Engineering & Public Works

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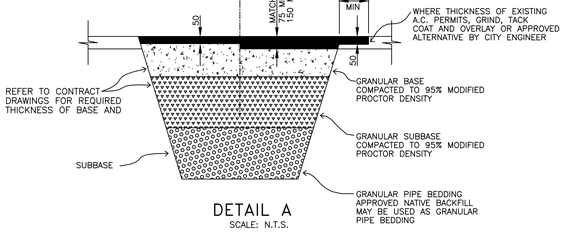
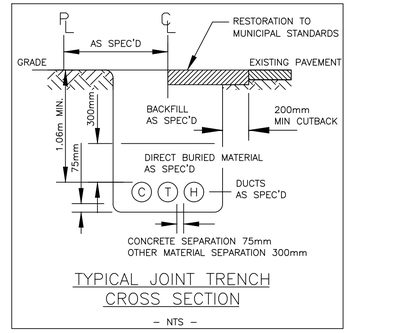
On behalf of the Manager of Capital Projects & Inspections

11/18/2022

Date



DETAIL A
SCALE: N.T.S.



TYPICAL JOINT TRENCH
CROSS SECTION

– NTS –

UPON COMPLETION OF SHAW CIVIL BUILD CONTACT ***shaw-inspections@encepta.net*** FOR FINAL INSPECTION

TELUS INSPECTOR NOTIFIED 48HRS PRIOR TO CONSTRUCTION
COMPANY
CONTRACTOR (SIGNATURE)
DATE

SHAW DUCT IDENTIFICATION TAGS INSTALLED
COMPANY
CONTRACTOR (SIGNATURE)
DATE

CONSTRUCTION NOTE:
A SITE INSPECTION MUST BE COMPLETED BY TELUS FOR ALL BREAKOUTS/INCURSIONS INTO TELUS STRUCTURES (SUCH AS SHAW PEDESTALS, SHAW OWNED DUCT ETC.)
CONTACT KATHY MIDWOOD AT TELUS (604-453-2037) 48 HOURS PRIOR TO CONSTRUCTION TO ARRANGE INSPECTION.
CREWS MUST SIGN OFF BELOW AFTER CONTACTING TELUS.
Completed by: (NAME) & (COMPANY) Date:

SUBMIT FOR CATV PERMIT
MUNICIPALITY
APPROVED (APPROVING OFFICER)
DATE

CONSTRUCTION NOTES

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11. CONTRACTOR MUST CONTACT A TELUS INSPECTOR 48 HRS. PRIOR TO CONNECTING TO TELUS FACILITIES.
12. PLACE 10mm BRAIDED NYLON CORD IN ALL MAINWAY AND SERVICE DUCTS.
13. WHERE FIBREGLASS SERVICE BOXES ARE USED, CONTRACTOR TO USE A SILICON BASED CAULKING TO SEAL DUCT ENTRY INTO BOX.
14. SHAW CABLESYSTEMS PROJECTMANAGERVANCOUVER@SJRB.CA

CAUTION! BURIED CABLES CALL DIG SHAW TO LOCATE

Dig Shaw
Call 1-866-DIGSHAW or visit digshaw.ca before you dig.

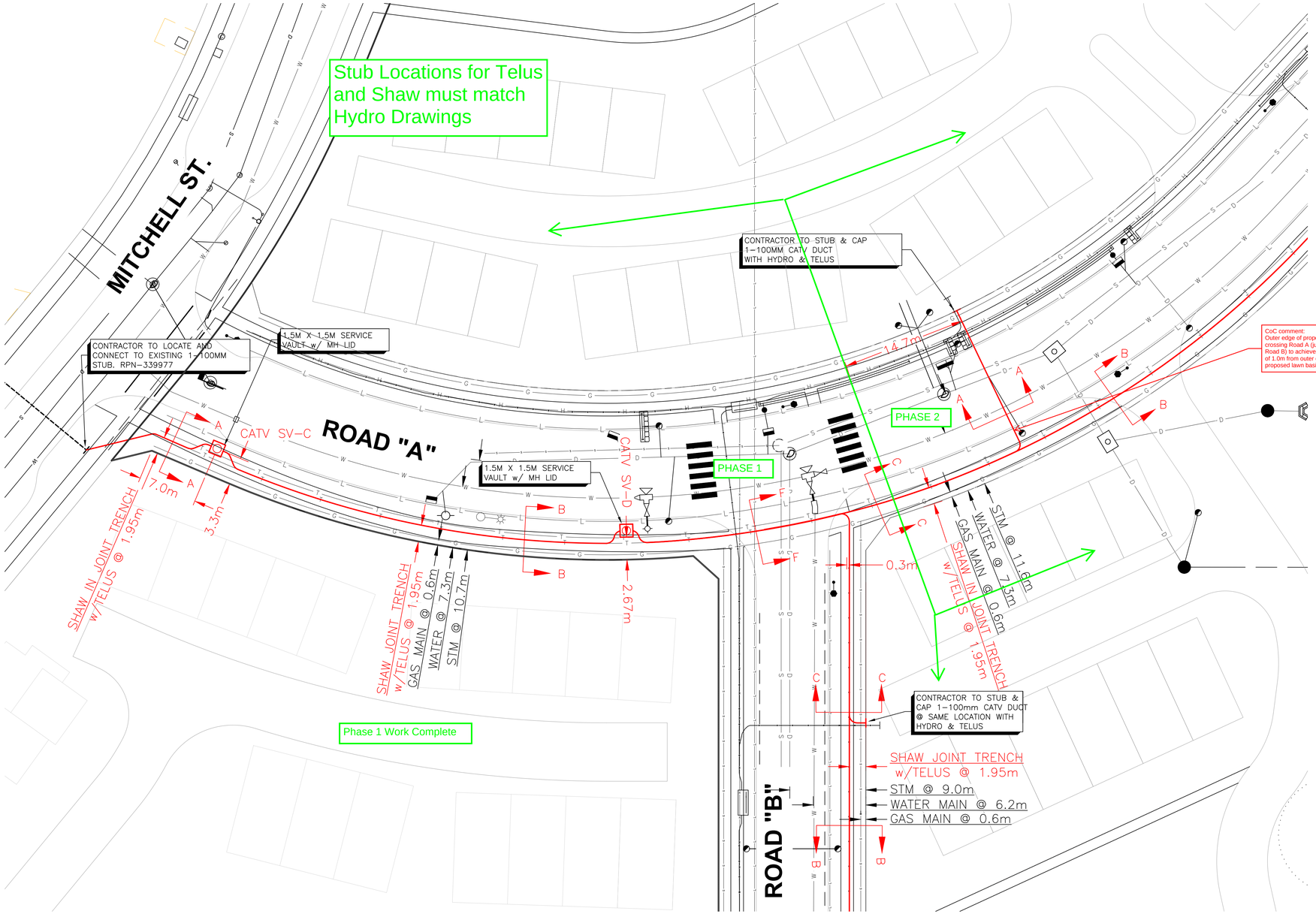
Shaw)
SHAW TOWER
900-1067 W CORDOVA ST.
VANCOUVER, B.C.
V6C 3T5

Issue	Date	Initials	
A	16/03/21	CT	ISSUE FOR APPROVAL

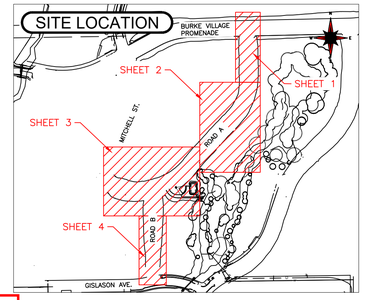
Designed By: N.DAVID
Drafted By: C.TRINH
Date: 03/03/21
Document Type: SERVICE BOX AND DUCT INSTALLATION DETAILS

Project: CONDUIT CONSTRUCTION TO SERVICE ROAD A & B
Location: LOWER BURKE VILLAGE COQUITLAM, B.C.

Scale: 1:250
Project No: PRJ-255924
Drawing No: (PER-1124613)
Sheet: 2 OF 4
Revision: A



SEE SHEET 2



LOCATION PLAN
SCALE: N.T.S.

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11/18/2022

Date

CoC comment:
Outer edge of proposed ducts crossing Road A (just east of Road B) to achieve a minimum of 1.0m from outer edge of proposed lawn basin and lead.

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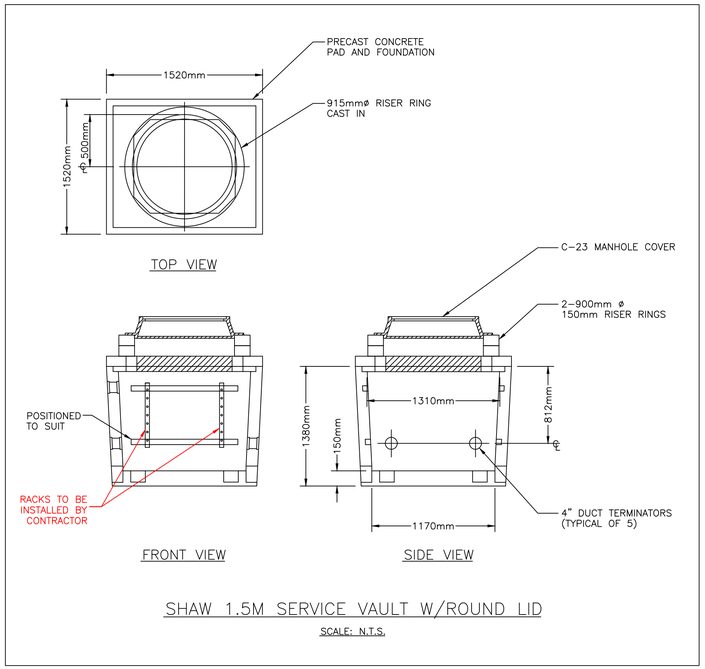

SHAW 1.5M SERVICE VAULT W/ROUND LID
SCALE: N.T.S.

SEE SHEET 4

SHAW SERVICE BOXES/VAULTS ARE NOT TO BE PLACED ON SIDEWALKS OR DRIVEWAYS

PROPOSED SHAW DUCT ALIGNMENT-SHEET 3

UPON COMPLETION OF SHAW CIVIL BUILD CONTACT ***shaw-inspections@encepta.net*** FOR FINAL INSPECTION

TELUS INSPECTOR NOTIFIED 48HRS PRIOR TO CONSTRUCTION
COMPANY
CONTRACTOR _____ SIGNATURE
DATE

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COMPANY
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Completed by: _____ Date: _____
(NAME) & (COMPANY)

SUBMIT FOR CATV PERMIT
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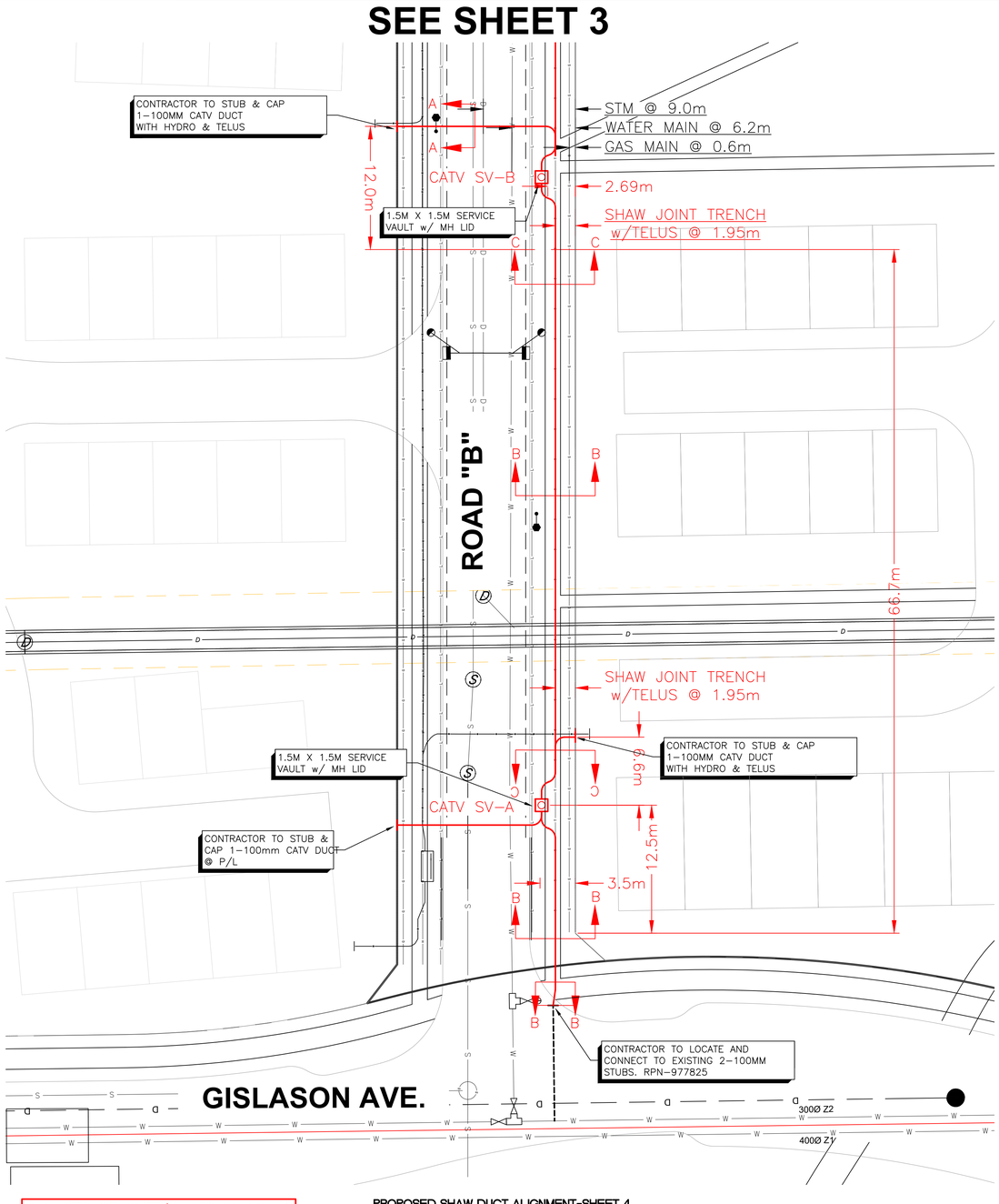
Issue	Date	Initials	
A	16/03/21	CT	ISSUE FOR APPROVAL
B	20/10/22	RG	ISSUE FOR APPROVAL

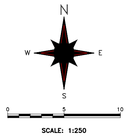
Designed By: N.DAVID
Drafted By: R. GARSUTA
Date: 20/10/22
Document Type: SERVICE BOX AND DUCT INSTALLATION DETAILS

Project: CONDUIT CONSTRUCTION TO SERVICE ROAD A & B
Location: LOWER BURKE VILLAGE COQUITLAM, B.C.

Scale: 1:250
Project No: PRJ-255924
Drawing No: (PER-1124613)
Sheet: 3 OF 4
Revision: B



PROPOSED SHAW DUCT ALIGNMENT-SHEET 4



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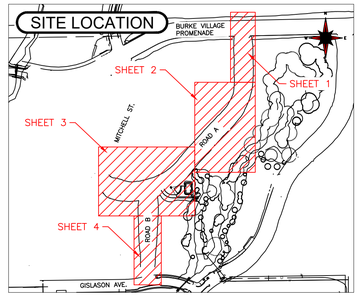

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Location: LOWER BURKE VILLAGE COQUITLAM, B.C.

Scale: 1:250
Project No: PRJ-255924
Drawing No: (PER-1124613)
Sheet: 4 OF 4
Revision: B

Appendix D

BC Hydro, Telus & Shaw Manhole Specifications

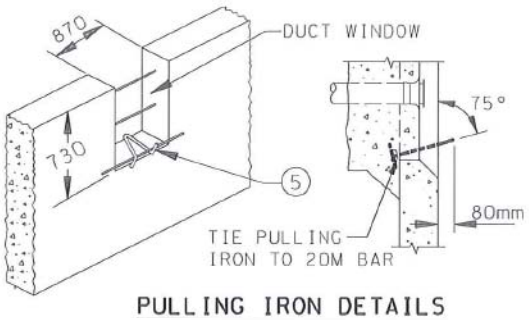
R3-REDRAWN 'OO-06-02 MF | R4-PULLING IRON REVISED. AUG'11 MK | R5-SUMP PIT LOCATIN REVISED. JUNE'12 MK

APPROXIMATE WEIGHTS:

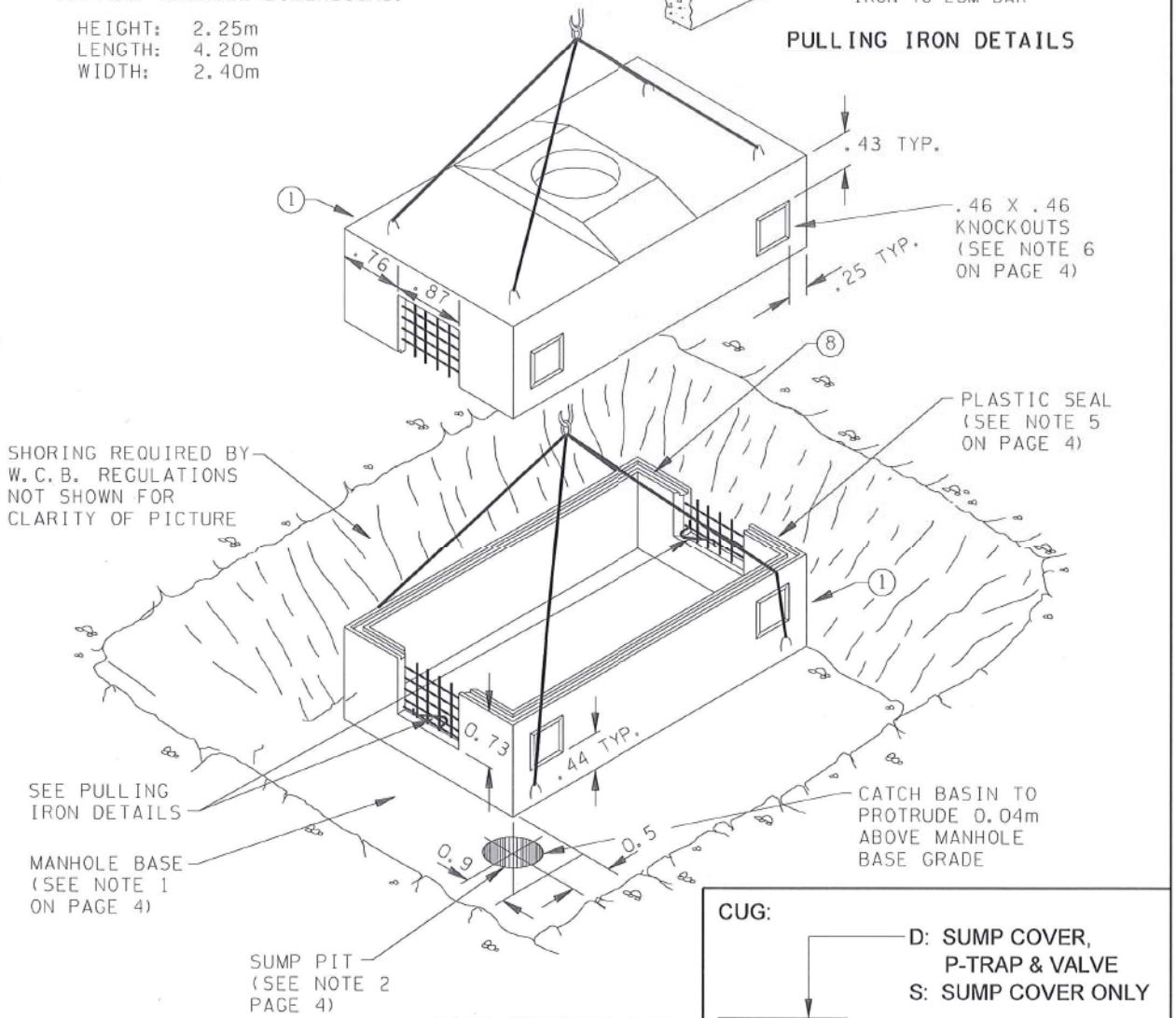
UPPER M/H SECTION: 6850kg.
LOWER M/H SECTION: 6150kg

APPROX. MANHOLE DIMENSIONS:

HEIGHT: 2.25m
LENGTH: 4.20m
WIDTH: 2.40m



PULLING IRON DETAILS



SITE PREPARATION FOR MANHOLE INSTALLATION

CUG:

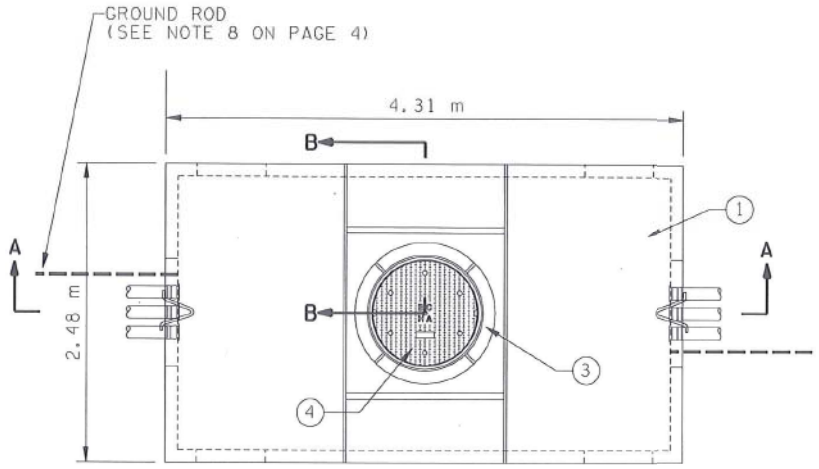
MHPDA

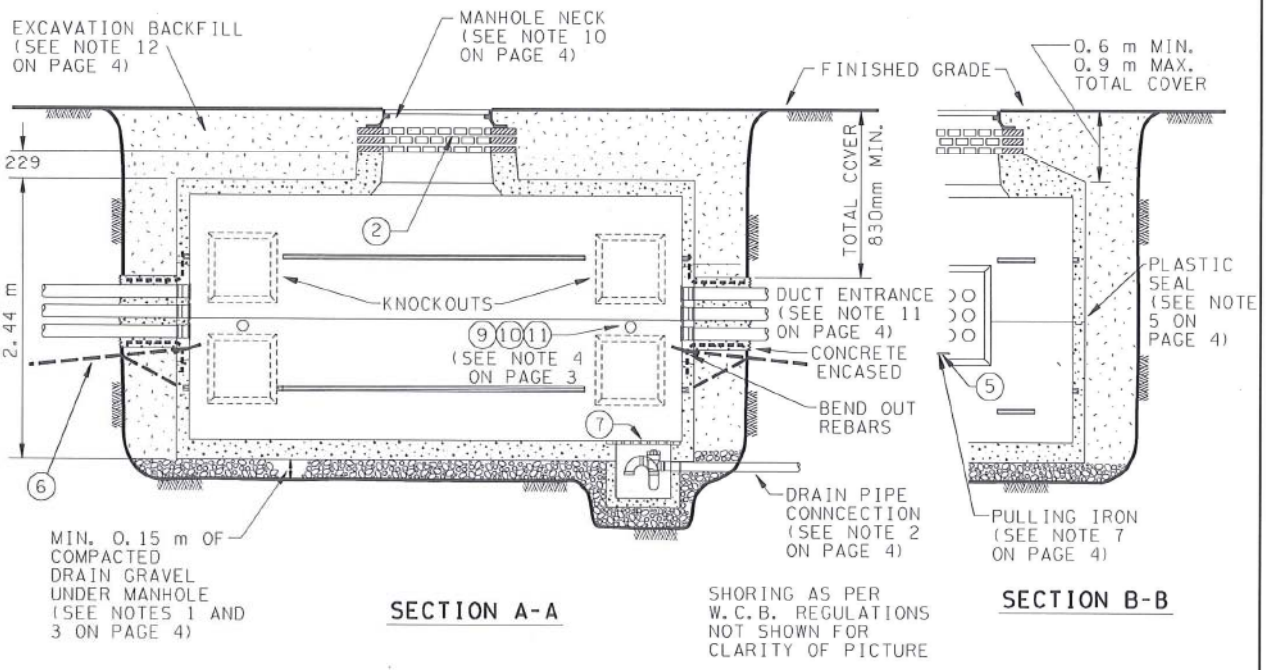
D: SUMP COVER, P-TRAP & VALVE
S: SUMP COVER ONLY

CIVIL ADJUSTMENT FACTORS (A, B, C, D, OR E)

DRAFTER: DC	DESIGNER M. KELVIN	RECOMMENDED L. STEVANOVIC	APPROVED F. DENNERT	PRECAST MANHOLE THROUGH TYPE INSTALLATION DETAILS
	ORIGINAL ISSUE DATE: MARCH 1980			

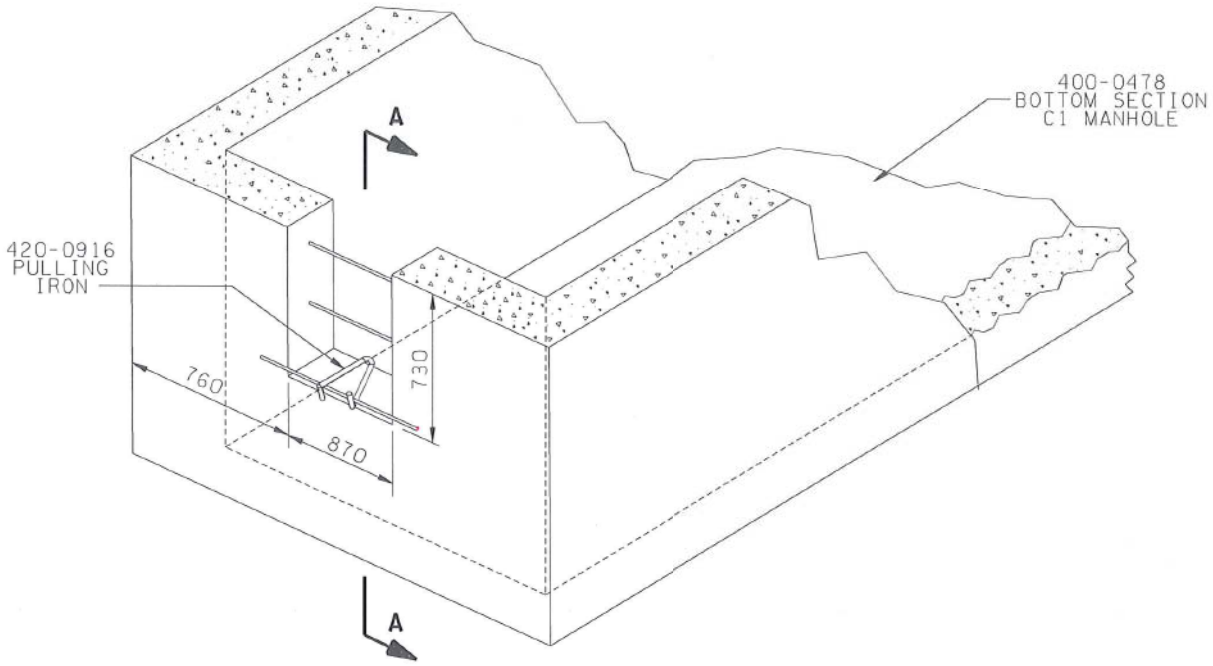
BC hydro DISTRIBUTION STANDARDS | PAGE 1 OF 4 | ES54 C1-01.01 | R. 5

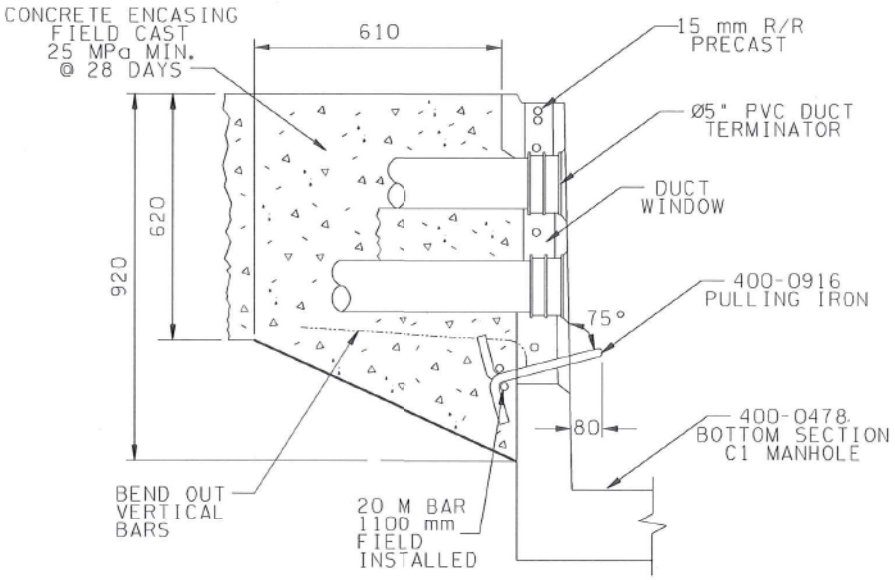




INSTALLATION DETAILS

DRAFTER: DC	DESIGNER	RECOMMENDED	APPROVED	PRECAST MANHOLE THROUGH TYPE INSTALLATION DETAILS		
	M. KELVIN	L. STEVANOVIC	F. DENNERT			
	ORIGINAL ISSUE DATE: MARCH 1980					
	BC hydro DISTRIBUTION STANDARDS			PAGE 2 OF 4	ES54 C1-01.02	R. 5





SECTION A-A

DRAFTER: DC	DESIGNER M. KELVIN	RECOMMENDED L. STEVANOVIC	APPROVED F. DENNERT	PRECAST MANHOLE THROUGH TYPE PULLING IRON INSTALLATION DETAILS
	ORIGINAL ISSUE DATE: JULY 2011			
BC hydro DISTRIBUTION STANDARDS		PAGE 3 OF 4	ES54 C1-01.03	R. 5

NOTES:

1. Excavate site allowing for 0.15 metres of 19 mm minus clear aggregate base.
2. Install sump, backwater valve with p-trap and drain pipe as shown on ES54 G2-01 type "A" or "B".
3. Hoist the manhole bottom section with a suitable crane and lower it onto the manhole base. Seal the space between the installed sump and the manhole sump opening with mortar.
4. Install four shoulder eyebolts between vertical side knockouts. Delete shoulder eyebolts only when assured that no lateral ducts will be installed in the future. Unused eyebolt holes shall be grouted with mortar to seal the manhole walls.
5. Place plastic seal in groove of manhole bottom section, then lower manhole top section into place. Parge the inside joints between the two manhole sections with mortar.
6. Break out the knock-outs used for lateral ducts with sledge hammer.
7. Install pulling irons as shown on the detail on page 1 and page 3.
8. Install either one or two ground rods as shown, as required in the project specifications.
9. Refer to ES54 R3-01 for detailed grounding requirements.
10. Build manhole neck to a minimum height of 200mm using spacer rings. Use one layer of mortar between spacers and, between spacers and adjacent structures. Parge the inside of the neck and engrave the manhole number near the upper end of the neck as referred to in the project specifications.
11. Make duct entrances as shown on ES54 H3-01.
12. Back fill the excavation and compact the backfill material as required in the project specifications.
13. Restore the surface at finished grade as required in the project specifications.
14. Precast manholes are designed for BCL625 dynamic load allowance as per CSA standard CAN/CSA-S6.

BILL OF MATERIAL

Item	Quantity	Description	Stock No.	Supplied By	Installed By
1	1	Precast Manhole	400-0478	BCHydro	Contractor
2	as req'd	Concrete Rings	N/A	Contractor	Contractor
3	1	Manhole Frame	400-0401	BCHydro	Contractor
4	1	Manhole Cover	400-0411	BCHydro	Contractor
5	2	Pulling Iron-Galvanized	420-0916	BCHydro	Contractor
6	1(2)	Ground Rod	420-1093	BCHydro	Contractor
7	1	Sump Cover	400-0426	BCHydro	Contractor
8	3 Rolls	Manhole Joint Sealant	141-1346	BCHydro	Contractor
9	as req'd	Shoulder Eye Bolt c/w Nut Galv.	420-1184	BCHydro	Contractor
10	as req'd	Square Washer Galv.	420-1528	BCHydro	Contractor
11	as req'd	Rubber Washer Round	102-4230	BCHydro	Contractor

REFERENCE DRAWINGS

ES54 R3-01	Grounding in Manholes
ES54 H3-01	Window Openings in u/g Chambers
ES54 H2-01/02/03	Standard Cross Sections 3"/4"/5" Ducts
ES54 G2-01	Drainage systems
ES53 C10-02	Manhole Racking Details

DRAFTER: DC

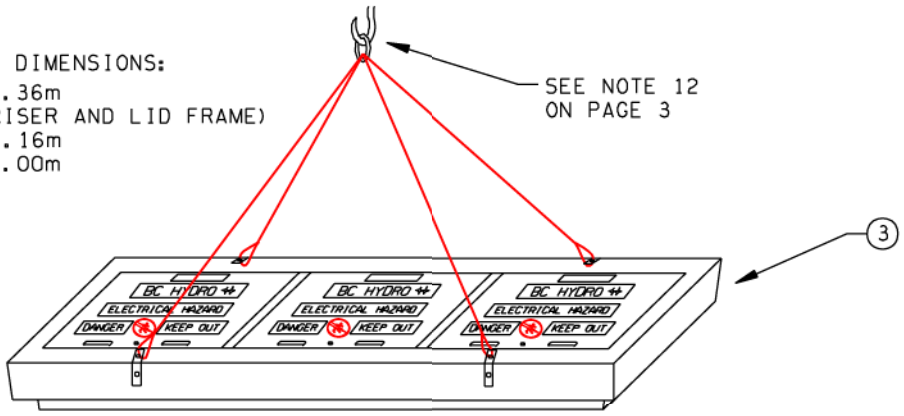
DESIGNER	RECOMMENDED	APPROVED
M. KELVIN	L. STEVANOVIC	F. DENNERT

ORIGINAL ISSUE DATE: MARCH 1980

PRECAST MANHOLE THROUGH TYPE INSTALLATION DETAILS

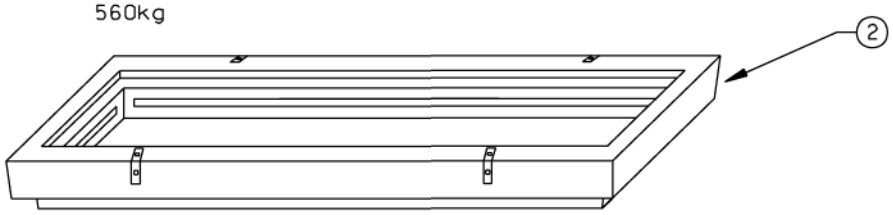
BCHydro DISTRIBUTION STANDARDS | PAGE 4 OF 4 | ES54 C1-01.04 | R. 5

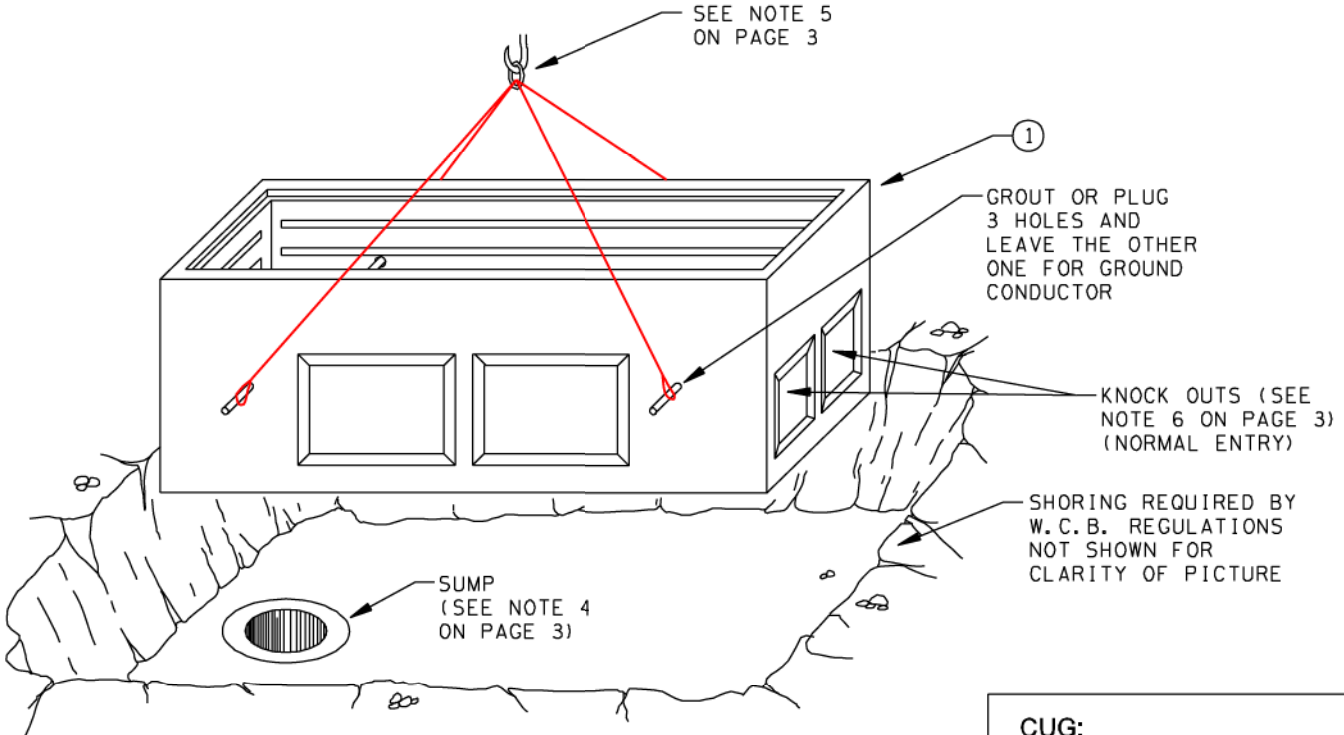
APPROX. BOX DIMENSIONS:
HEIGHT: 1.36m
(INCL. RISER AND LID FRAME)
WIDTH: 1.16m
LENGTH: 3.00m



APPROX. BOX WEIGHTS:

832 BOX	1950kg,
832 RISER	290kg,
832 COLLAR & LID	560kg





SITE PREPARATION FOR
BOX, RISER, AND LID
INSTALLATION

CUG:

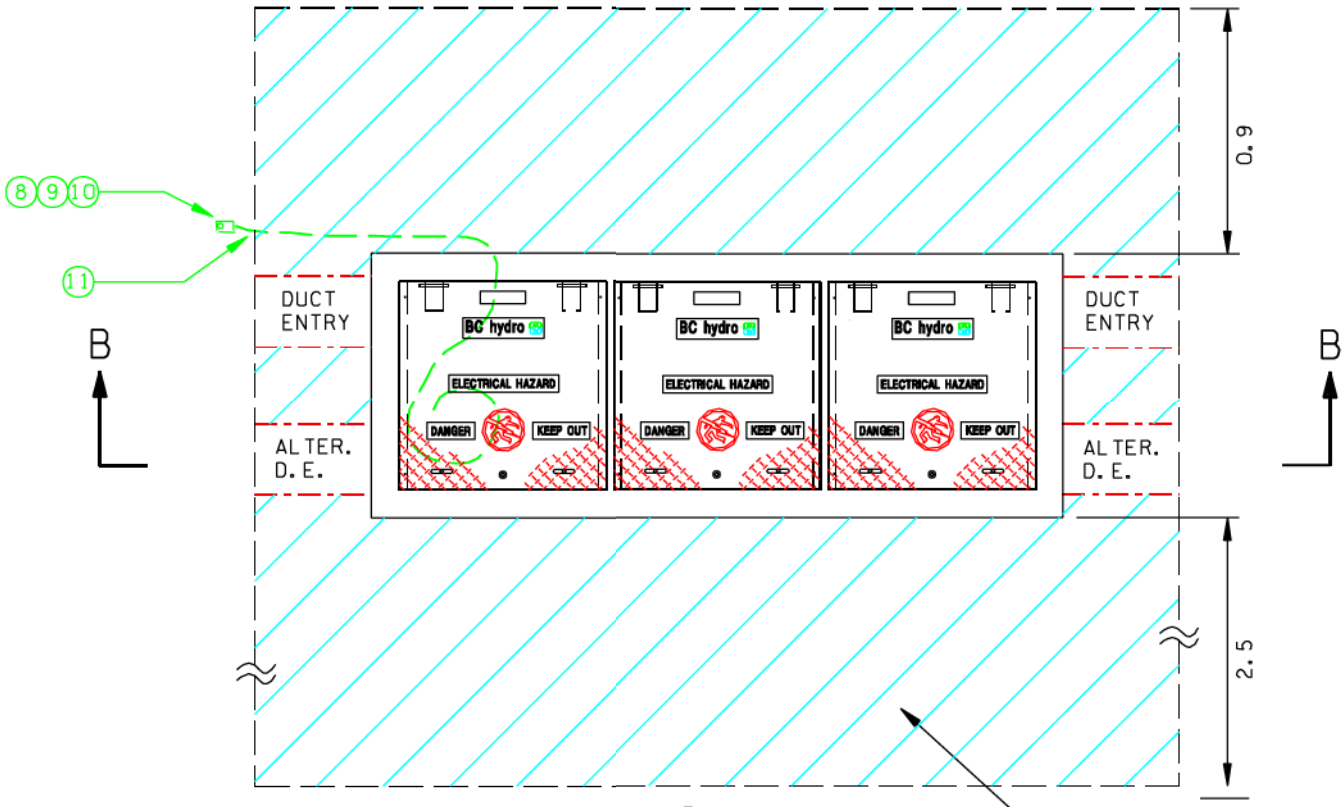
JB3Ø

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: NOVEMBER 1979

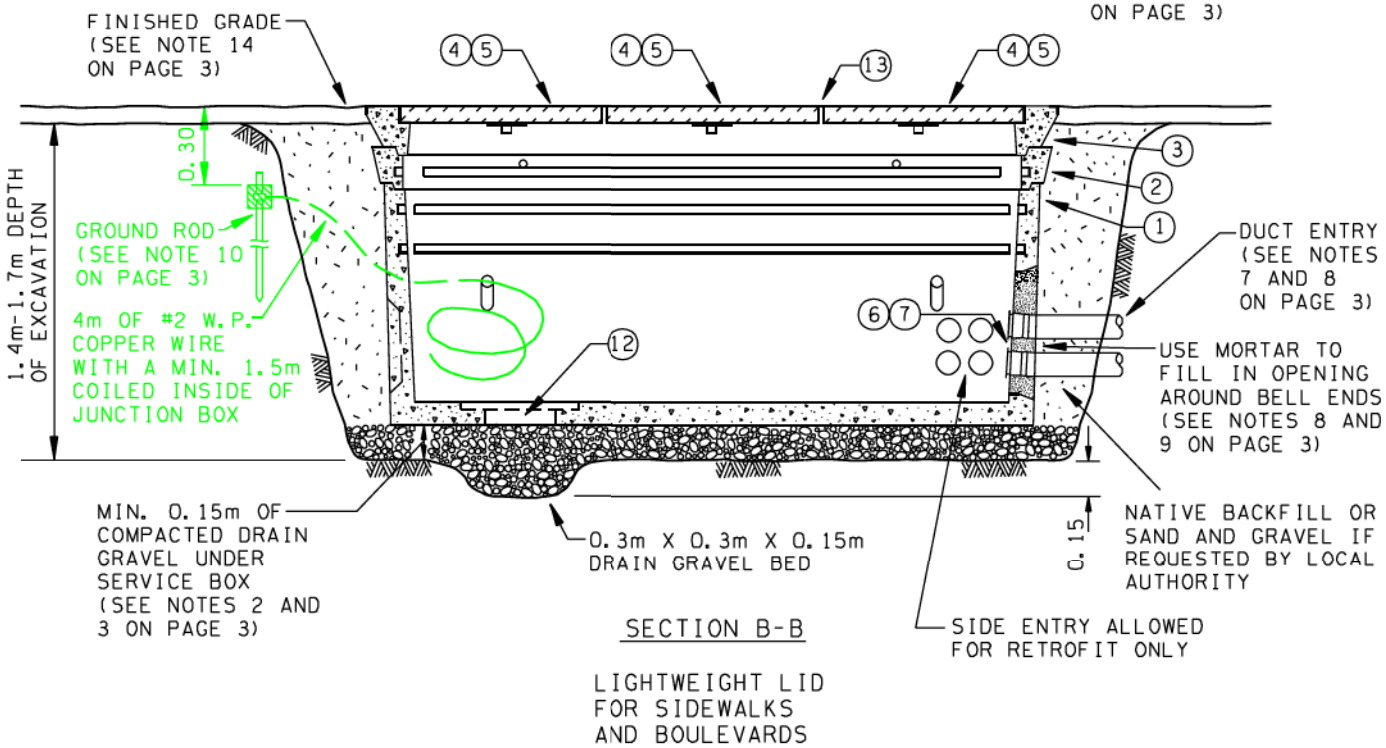
THREE Ø JUNCTION BOX 832 PRECAST CONCRETE INSTALLATION DETAILS

REVISED | R5-REDRAWN '98-12-08 MF



PLAN
COVER INSTALLATION

UNOBSTRUCTED AREA (4.5m X 3.6m) (SEE NOTE 15 ON PAGE 3)



SECTION B-B

LIGHTWEIGHT LID FOR SIDEWALKS AND BOULEVARDS

DRAFTER	DESIGNER	APPROVED	THREE Ø JUNCTION BOX 832 PRECAST CONCRETE INSTALLATION DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1979			

REVISED

NOTES:

1. Level base such that tip of lid is flush to finished grade on all sides.
2. Allow minimum of 0.15m of drain gravel base under junction box.
3. Compaction density requirements are:
   (A) 85% of standard proctor density in boulevard areas.
   (B) 95% of standard proctor density in traffic areas.
4. Install sump and drain pipe as shown on ES54 G3-01 if required by BC Hydro designer.
5. Hoist the junction box with a suitable crane and lower it onto the base. Seal the space between the installed sump and the sump opening of the junction box with mortar.
6. Break out the knock-outs as required and install the ducts as shown.
7. Maintain 0.9m minimum cover over ducts.
8. Duct entry shall be in accordance with ES54 H1-06 and H2-01. Max. of 2 ducts in height are allowed.
9. BC Hydro designer shall specify the number and size of bell ends and plugs.
10. For grounding details see drawing ES54 R2-01.
11. BC Hydro designer is to specify orientation of the lids to allow for proper operating position for line crews.
12. Install riser and lid with crane as shown.
13. Backfill the excavation and compact the backfill material as required in the project specification.
14. Restore the surface at finished grade as required in the project specifications.
15. The dimensions of the unobstructed area are minimum clearances. Any vegetation on the perimeter of the unobstructed area must be of the type that can be trimmed annually to maintain clearances. The unobstructed area shall be at the same plane as the box surface. In order to accomplish this a retaining wall may be required.
16. For structures in the vicinity of ditches and roads. See ES54 U5-02.

BILL OF MATERIAL

Item	Quantity	Description	Stock No.	Supplied By	Install By
1	1	832 Junction Box	400-0990	BCHydro	Contractor
2	1	832 Junction Box Riser	400-0992	BCHydro	Contractor
3	1	832 Lid Collar Assembly	400-0993	BCHydro	Contractor
4	3	Lightweight Lid	400-0499	BCHydro	AE Concrete
5	3	Hardware for Lightweight Lid	412-0042	BCHydro	AE Concrete
6	(See Note 6)	3" Bell End	401-0183	Contractor	Contractor
7	(See Note 6)	3" Plug	401-0197	Contractor	Contractor
8	1	5/8" Ground Rod	420-1173	BCHydro	Contractor
9	1	Ground Connector			
10	as req'd	Mastic			
11	4m	#2 AWG WP Copper Conductor			
12	1	Sump Cover	400-0426	BCHydro	Contractor
13	2	Tamperproof Bar	400-0501	BCHydro	AE Concrete

REFERENCE DRAWINGS

ES54 H2-01/02/03	Standard Cross Sections 3"/4"/5" Ducts	ES53/54 Z2-01	Duct and Accessories
ES54 H1-06	Duct Entrance Details	ES53/54 Z1	Service Boxes
ES54 G3-01	Drainage	ES54 U5-02	Boxes Near Ditches
		ES54 R2-01	Grounding

DRAFTER	DESIGNER	APPROVED
JW/DM	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: DECEMBER 1998

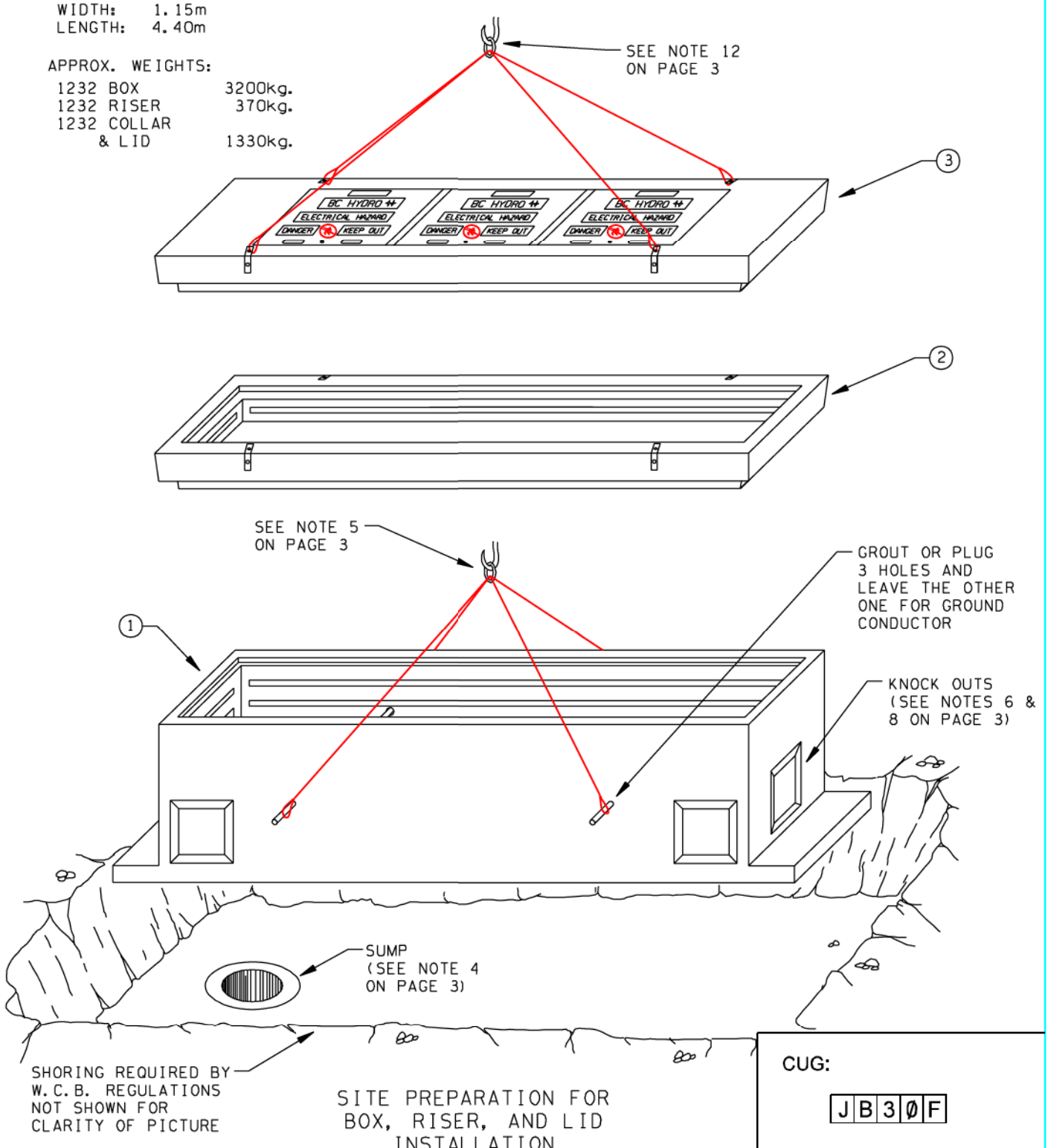
THREE Ø JUNCTION BOX 832 PRECAST CONCRETE INSTALLATION DETAILS

REVISED

APPROX. BOX DIMENSIONS:
HEIGHT: 1.36m
(INCL. RISER AND LID FRAME)
WIDTH: 1.15m
LENGTH: 4.40m

APPROX. WEIGHTS:

1232 BOX	3200kg.
1232 RISER	370kg.
1232 COLLAR & LID	1330kg.



SITE PREPARATION FOR BOX, RISER, AND LID INSTALLATION

CUG:

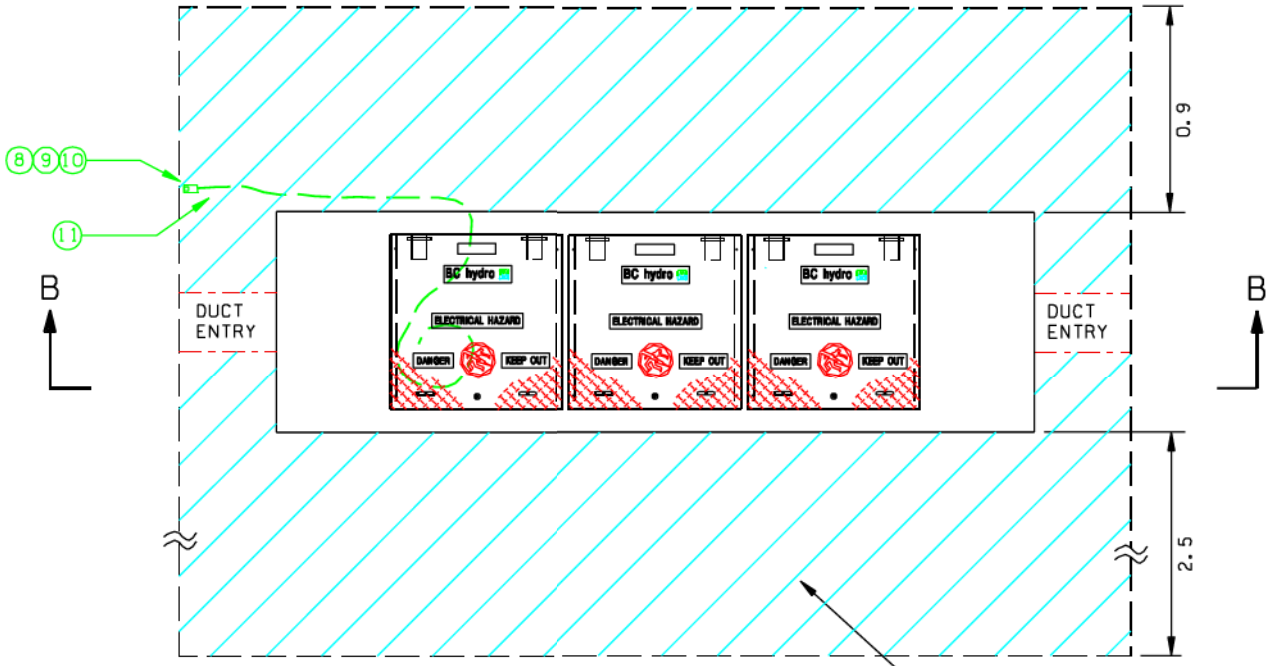
JB3ØF

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

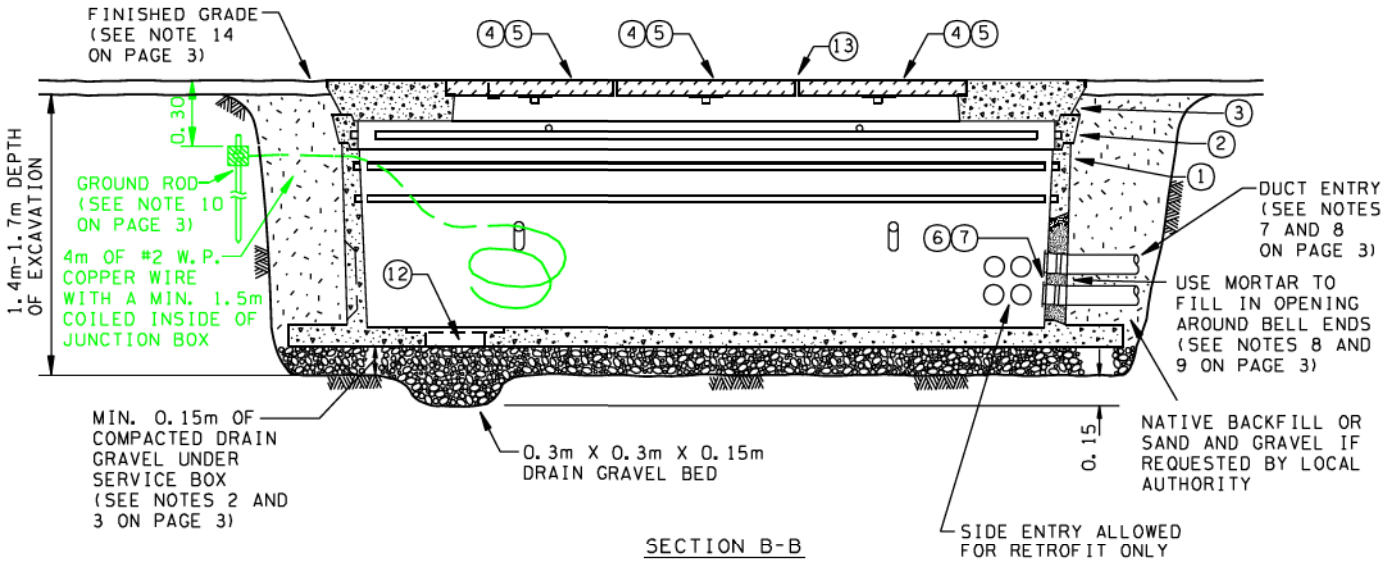
ORIGINAL ISSUE DATE: NOVEMBER 1982

THREE Ø FEEDER JUNCTION BOX 1232 PRECAST CONCRETE INSTALLATION DETAILS

REVISED | R4-REDRAWN '98-12-11 MF



PLAN
COVER INSTALLATION



SECTION B-B

LIGHTWEIGHT LID
FOR SIDEWALKS
AND BOULEVARDS

DRAFTER	DESIGNER	APPROVED	THREE Ø FEEDER JUNCTION BOX 1232 PRECAST CONCRETE INSTALLATION DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1982			

REVISED

NOTES:

1. Level base such that tip of lid is flush to finished grade on all sides.
2. Allow minimum of 0.15m of drain gravel base under junction box.
3. Compaction density requirements are:
   (A) 85% of standard proctor density in boulevard areas.
   (B) 95% of standard proctor density in traffic areas.
4. Install sump and drain pipe as shown on ES54 G3-01 if required by BC Hydro designer.
5. Hoist the junction box with a suitable crane and lower it onto the base. Seal the space between the installed sump and the sump opening of the junction box with mortar.
6. Break out the knock-outs as required and install the ducts as shown.
7. Maintain 0.9m minimum cover over ducts.
8. Duct entry shall be in accordance with ES54 H1-06 and H2-01. Max. of 4-5" ducts per window are allowed in a 2 x 2 configuration.
9. BC Hydro designer shall specify the number and size of bell ends and plugs.
10. For grounding details see drawing ES54 R2-01.
11. BC Hydro designer is to specify orientation of the lids to allow for proper operating position for line crews.
12. Install riser and lid with crane as shown.
13. Backfill the excavation and compact the backfill material as required in the project specification.
14. Restore the surface at finished grade as required in the project specifications.
15. The dimensions of the unobstructed area are minimum clearances. Any vegetation on the perimeter of the unobstructed area must be of the type that can be trimmed annually to maintain clearances. The unobstructed area shall be at the same plane as the box surface. In order to accomplish this a retaining wall may be required.
16. For structures in the vicinity of ditches and roads. See ES54 U5-02.

BILL OF MATERIAL

Item	Quantity	Description	Stock No.	Supplied By	Install By
1	1	1232 Junction Box	400-0915	BCHydro	Contractor
2	1	1232 Junction Box Riser	400-0984	BCHydro	Contractor
3	1	1232 Lid Collar Assembly	400-0916	BCHydro	Contractor
4	3	Lightweight Lid	400-0499	BCHydro	AE Concrete
5	3	Hardware for Lightweight Lid	412-0042	BCHydro	AE Concrete
6	(See Note 6)	3" Bell End	401-0183	Contractor	Contractor
OR	(See Note 6)	5" Bell End	401-0185	BCHydro	Contractor
7	(See Note 6)	3" Plug	401-0197	Contractor	Contractor
OR	(See Note 6)	5" Plug	401-0199	BCHydro	Contractor
8	1	5/8" Ground Rod	420-1173	BCHydro	Contractor
9	1	Ground Connector			
10	as req'd	Mastic			
11	4m	#2 AWG WP Copper Conductor			
12	1	Sump Cover	400-0426	BCHydro	Contractor
13	2	Tamperproof Bar	400-0501	BCHydro	AE Concrete

REFERENCE DRAWINGS

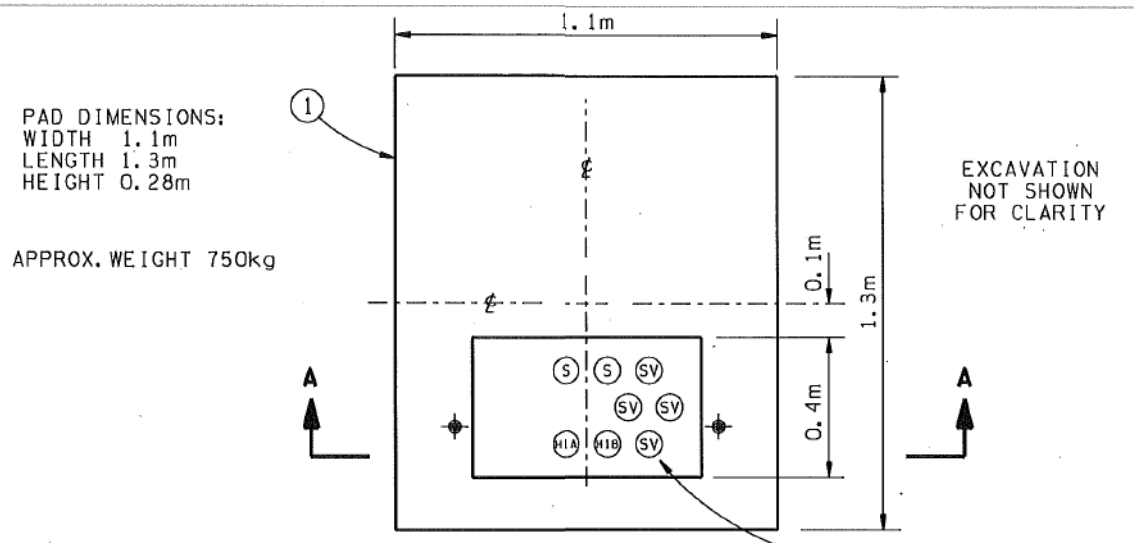
ES54 R2-01	Grounding		ES53/54 Z2-01	Duct and Accessories
ES54 H2-01/02/03	Standard Cross Sections 3"/4"/5" Ducts		ES53/54 Z1	Service Boxes
ES54 H1-06	Duct Entrance Details		ES54 U5-02	Boxes Near Ditches
ES54 G3-01	Drainage		ES54 R2-01	Grounding

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: NOVEMBER 1982

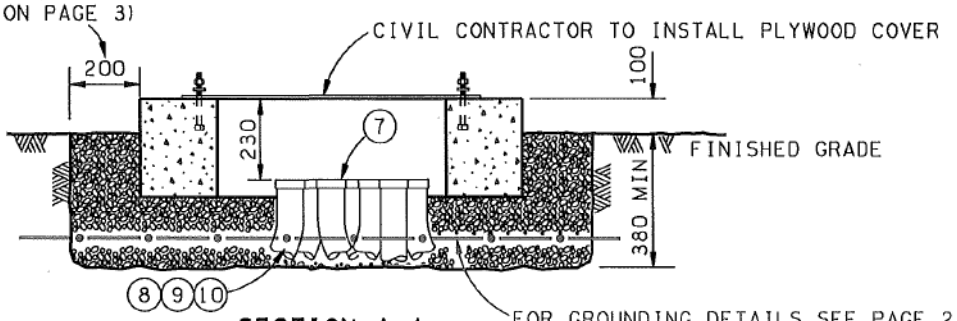
THREE Ø FEEDER JUNCTION BOX 1232 PRECAST CONCRETE INSTALLATION DETAILS

REVISED



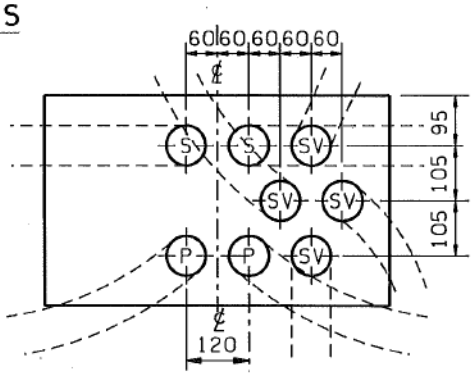
PLAN VIEW

40mm MINUS CRUSHED DRAIN ROCK
200mm MIN. AROUND PAD.
(SEE NOTES 1, 2, & 6 ON PAGE 3)



SECTION A-A

INSTALLATION DETAILS



DUCT PLACEMENT
DETAIL A

NOTES:

1. For general trenching details see ES54 H1-01.
2. For installation in unstable ground see ES54 U4.
3. There shall be no vegetation or pavement over the drain rock around the pad.
4. Drain rock is required for oil containment.
5. Designer is to specify orientation of pad to allow for safe operating position for crews.
6. The maximum number of service and/or secondary duct bends from the flat pad are six.

CUG: PCR"X"
"X" Number of bends
0, 2 to 8

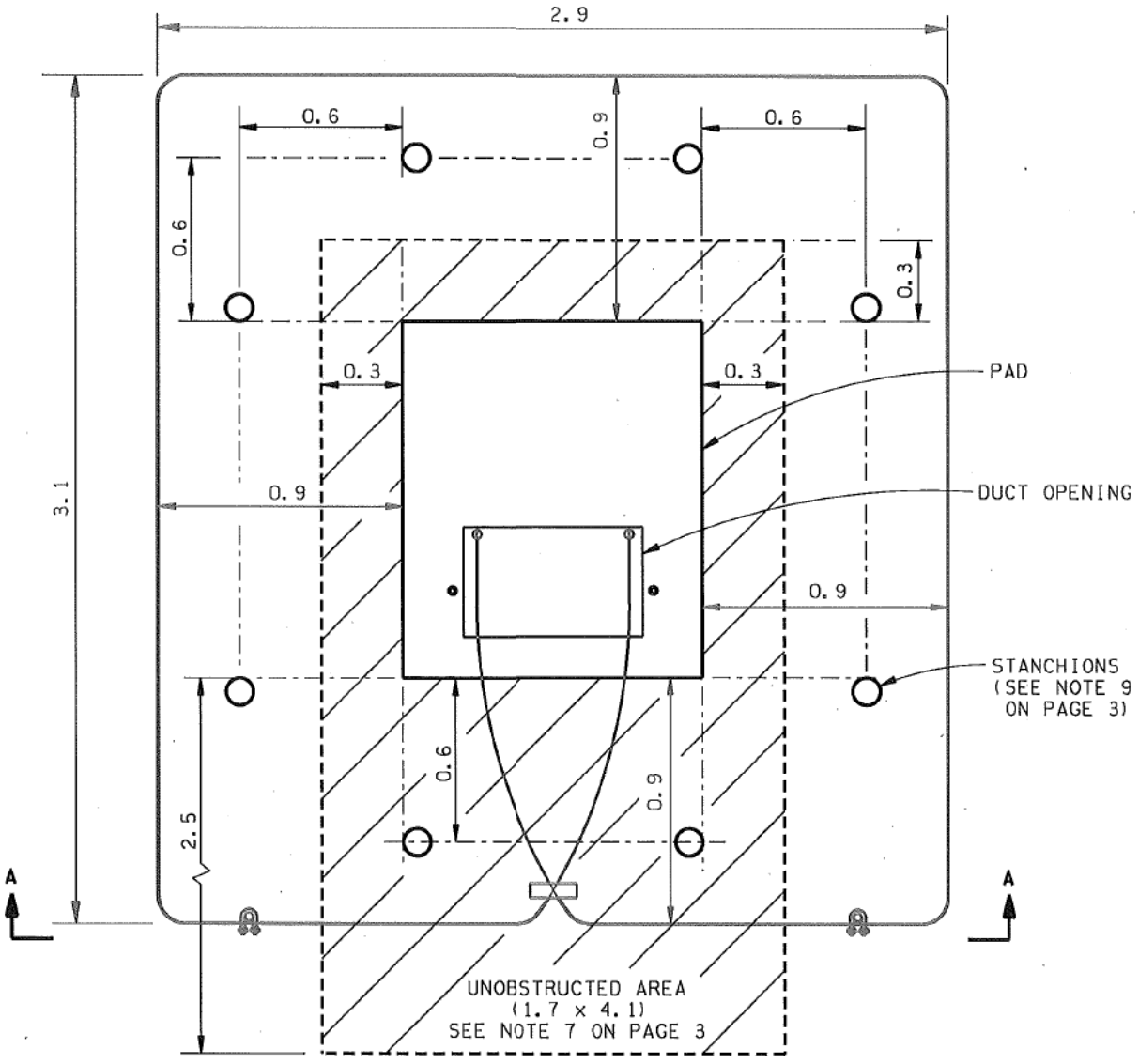
R. 4-REDONE JAN. '05 FK | R. 5- NO. OF DUCTS APR. '07 MK | R. 6- HV CONDUITS MOVED. APR. '09 MK

DRAFTER: DC

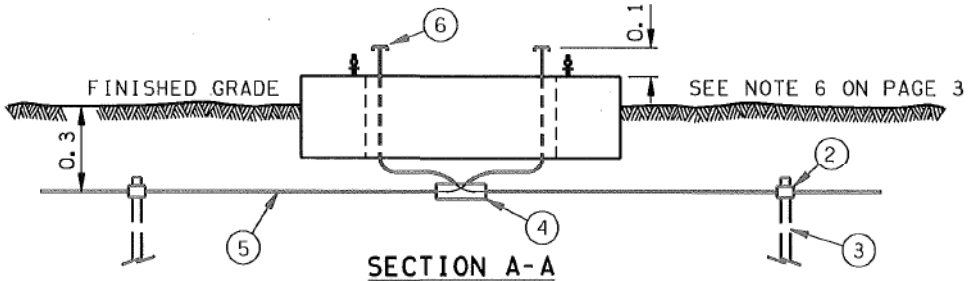
DESIGNER	RECOMMENDED	APPROVED
M. [illegible]	F. KAEMPFFER	F. DENNERT

ORIGINAL ISSUE DATE: MARCH 1999

SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PAD INSTALLATION DETAILS



PLAN VIEW (EARTH NOT SHOWN)



SECTION A-A

GROUNDING SYSTEM DETAILS

R.6- HV CONDUITS MOVED. APR. '09 MK

DRAFTER: DM

DESIGNER	RECOMMENDED	APPROVED	SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PAD INSTALLATION DETAILS
M. KELVIN	F. KAEMPFFER	F. DENNERT	
ORIGINAL ISSUE DATE: MARCH 1999			

NOTES:

1. Allow minimum of 0.20m of 40mm minus crushed drain rock base under and around LPT pad.
2. Compaction density requirements are 85% of standard proctor density in boulevard areas.
3. Maintain 0.9m minimum cover over ducts.
4. Duct entry shall be in accordance with ES54 H1-03.
5. For grounding details see drawings ES54 R1-01.
6. Restore surface at finished grade as required in the project specifications.
7. The dimensions of the unobstructed area are minimum clearances. Any vegetation on the perimeter of the unobstructed area must be of the type that can be trimmed annually to maintain clearances.
8. For structures in the vicinity of ditches and roads see ES54 U5-01.
9. Maximum number of stanchions shown. Designer to determine the number of stanchions required. Stanchions to be installed in accordance with ES54 U2-02. Stanchions are required when transformer is within a distance of less than 1.5m from a rectangular curb.

BILL OF MATERIAL

Item	Quantity	Description	Stock No.	Supplied By	Installed By
1	1	Pad - Precast Concrete	400-0852	BC Hydro	Contractor
2	2	Connector, Grounding			
3	2	Ground Rod, 5/8" x 8'			
4	1	Rope Clamp, 3/4"	420-1171	BC Hydro	Contractor
5	14m	Counterpoise			
6	2	Cap, Heat Shrink			
7	As Req'd	3" Duct Cap	401-0173	Contractor	Contractor
8	As Req'd	3" 90° Bend	400-4021	Contractor	Contractor
9	As Req'd	PVC Cement	141-1044	Contractor	Contractor
10	As Req'd	Twine #8 Polypropylene	106-0420	Contractor	Contractor

Reference Drawings

ES54 U5-01	Pads in vicinity of ditches & roads
ES54 U4	Installation in unstable ground
ES54 U2-02	Stanchions
ES54 R1-01	Grounding
ES54 H1-03	Duct Entry
ES53/54 Z2-01	Duct and Accessories
ES53/54 Z1-05	Transformer Pads

R. 6- HV CONDUITS MOVED. APR. '09 MK

DRAFTER: DM

DESIGNER	RECOMMENDED	APPROVED
M. KELVIN	F. KAEMPFFER	F. DENNERT

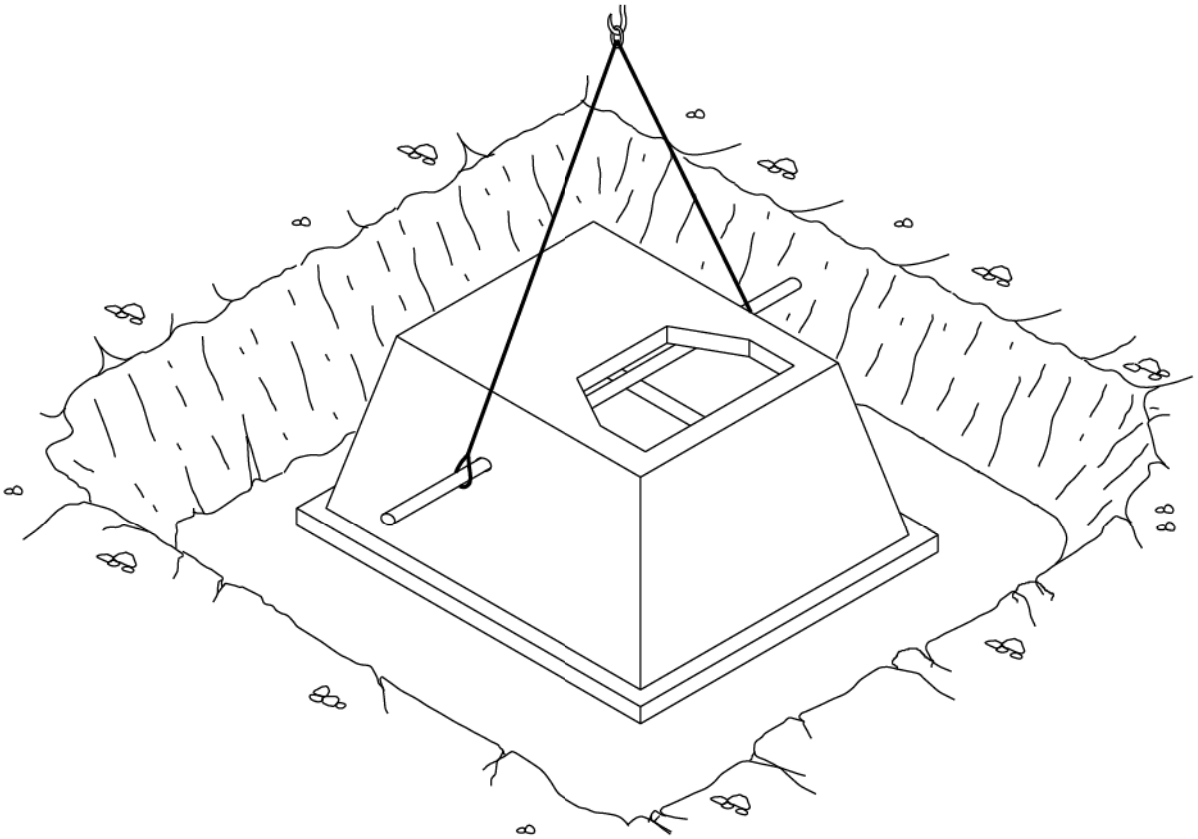
ORIGINAL ISSUE DATE: MARCH 1999

SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PAD INSTALLATION DETAILS

APPROXIMATE PAD DIMENSIONS:

HEIGHT: 0.76m
WIDTH: 1.52m
LENGTH: 1.76m

APPROXIMATE WEIGHT OF PAD: 1050kg



PYRAMID
PAD INSTALLATION

NOTE:

THE MAXIMUM NUMBER OF SERVICE AND/OR SECONDARY DUCT BENDS FROM THE PYRAMID PAD ARE EIGHT.

CUG: PYR "X"

"X" NUMBER OF 90° BENDS
0; 2; 3; 4; 5; 6; 7; 8; 9; 10

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

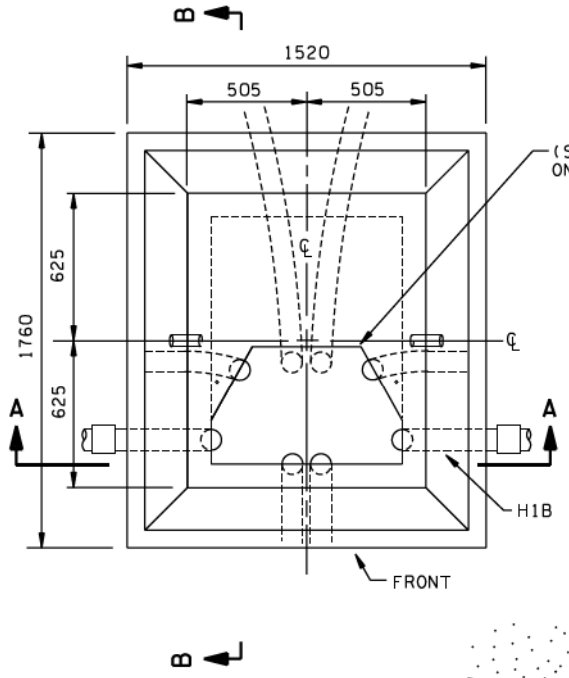
ORIGINAL ISSUE DATE: MARCH 1999

SINGLE PHASE
LOW PROFILE TRANSFORMER
PRECAST CONCRETE PYRAMID PAD
INSTALLATION DETAILS

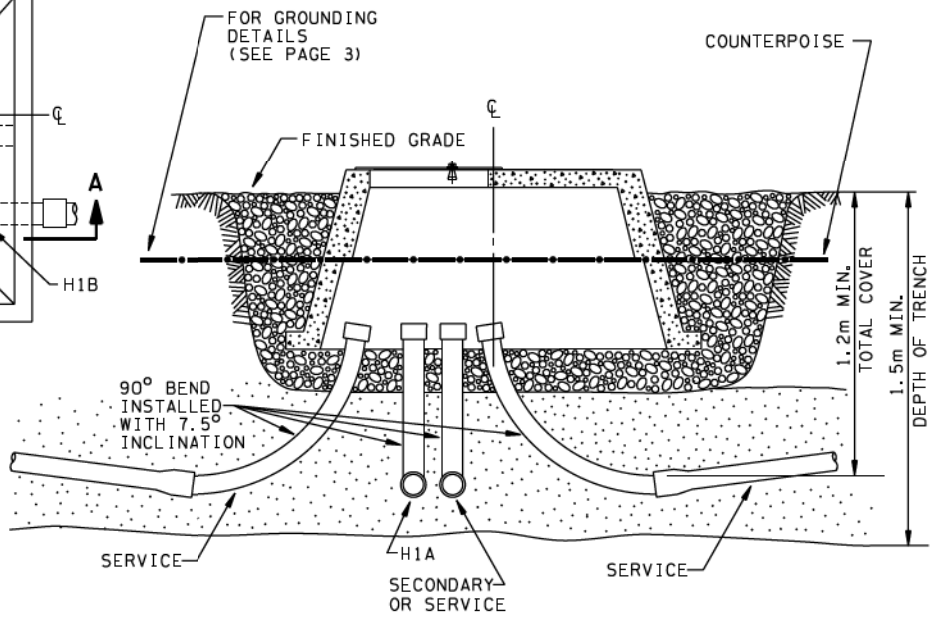
BC hydro DISTRIBUTION STANDARDS | PAGE 1 OF 4 | ES54 F1-03.01 | R. 5

REVISED R.4- REDRAWN & REVISED. MARCH '99 MF | R.5- NO. OF DUCTS APR. '07 MK

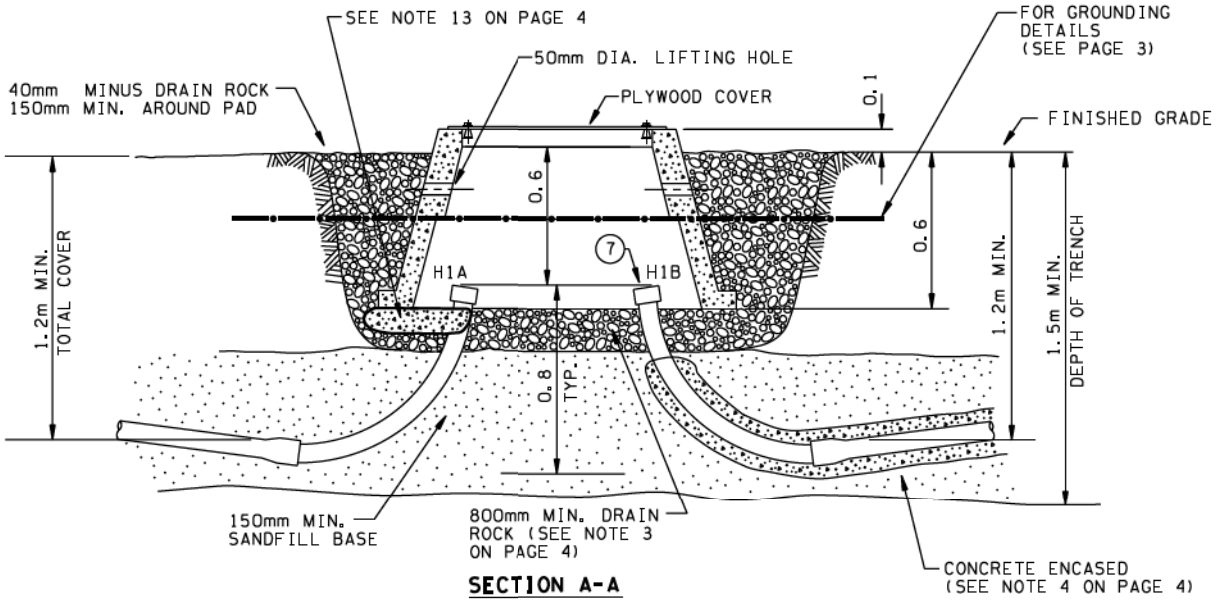
NOTE: MAXIMUM 8 LOW VOLTAGE DUCTS PERMITTED.



PLAN VIEW
8-3" DUCTS



SECTION B-B

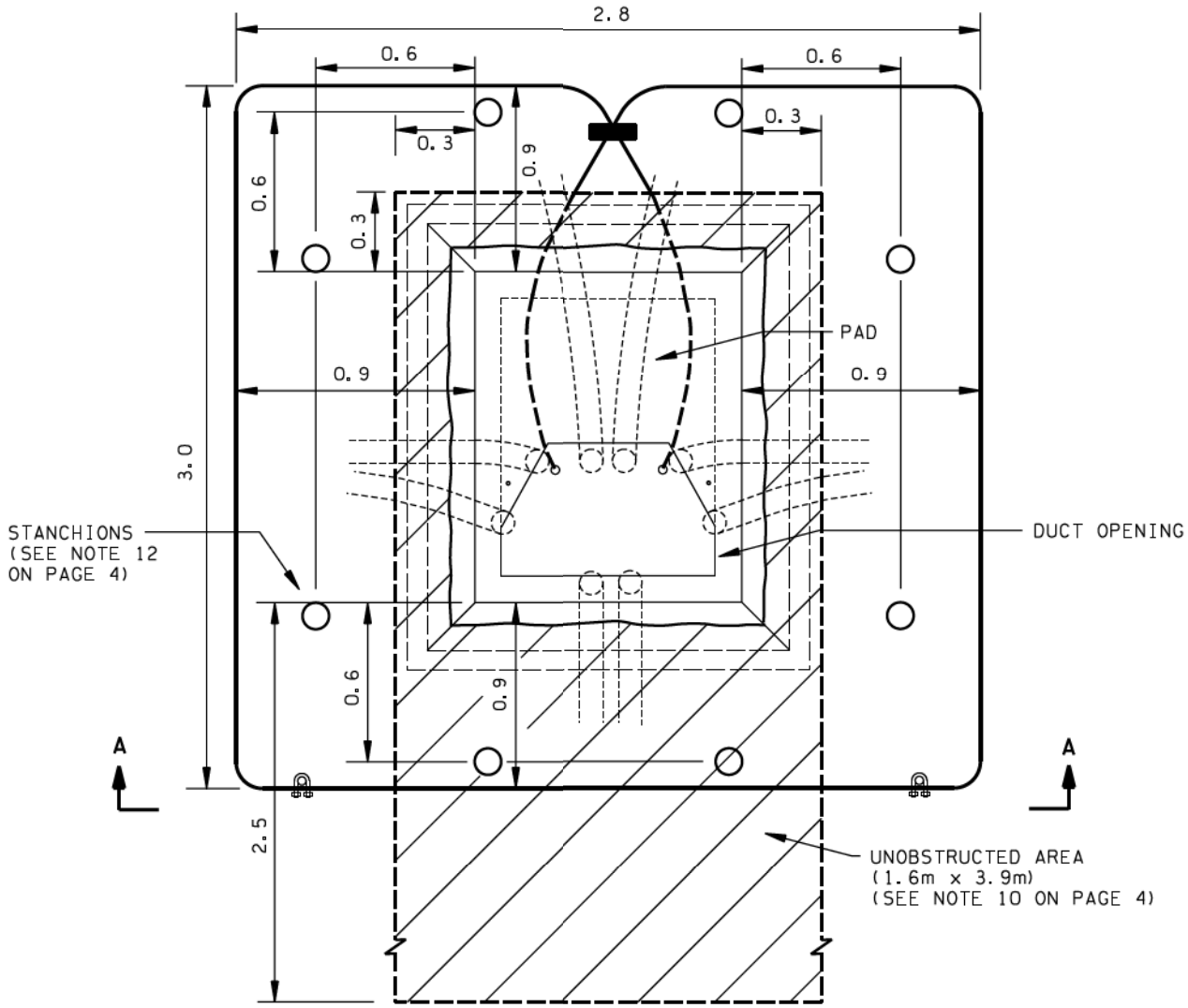


SECTION A-A

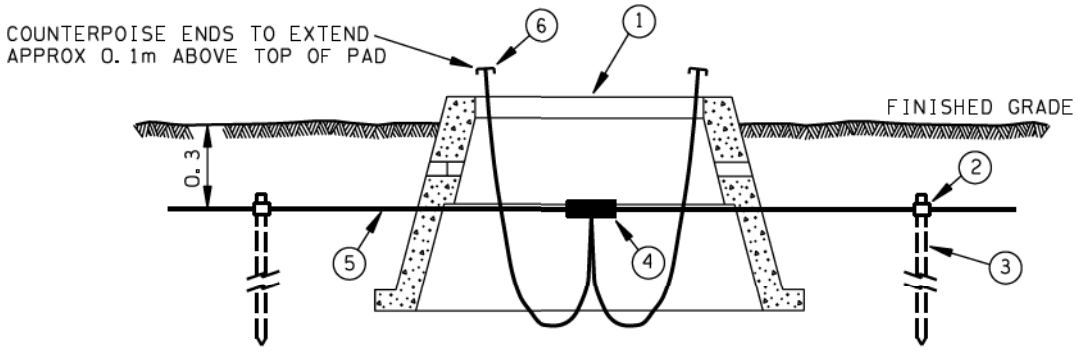
INSTALLATION DETAILS

DRAFTER	DESIGNER	APPROVED	SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PYRAMID PAD INSTALLATION DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: DECEMBER 1979			

REVISED



ORIENTATION, STANCHION LOCATIONS, AND CLEARANCES



SECTION A-A

FOR MORE DETAILS ON GROUNDING
SEE SECTION R.

GROUNDING SYSTEM DETAILS

DRAFTER	DESIGNER	APPROVED	SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PYRAMID PAD INSTALLATION DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: DECEMBER 1979			

REVISED

NOTES:

1. Level base such that minimum protrusion of pad is 0.1m above finish grade. Pad surface must be level.
2. Allow minimum of 0.15m of 40mm minus crushed drain rock base under pyramid pad.
3. Compaction density requirements are 85% of standard proctor density.
4. Concrete encasement of ducts, whenever specified by BC Hydro designer, is to extend within the perimeter of pyramid pad.
5. Maintain 1.2m minimum cover over ducts near the pad.
6. Duct entry shall be in accordance with ES54 H1-06.
7. For installation in unstable ground see ES54 U4.
8. There shall be no vegetation or pavement over the drain rock around the pad.
9. For grounding details see drawing ES54 R1.
10. The dimensions of the unobstructed area are minimum clearances. Any vegetation on the perimeter of the unobstructed area must be of the type that can be trimmed annually to maintain clearances.
11. For structures in the vicinity of ditches and roads see ES54 U5-01.
12. Maximum number of stanchions shown. Designer to determine the number of stanchions required. Stanchions to be installed in accordance with ES54 U2-02.
13. For cable pulls exceeding a pulling tension of 0.8kN see ES53 U1-04. Replace the gravel under the pad at the duct entrance with a 25kg bag of ready mix concrete.

BILL OF MATERIAL

Item	Quantity	Description	Stock No.	Supplied By	Install By
1	1	Precast Pyramide Pad	400-0851	BCHydro	Contractor
2	2	Connector, Grounding			
3	2	Ground Rod, 5/8" x 8'			
4	1	Rope Clamp, 3/4"	420-1170	BCHydro	Contractor
5	18m	Counterpoise			
6	2	Cap, Heat Shrink			
7	as req'd	3" Duct Cap	401-0173	Contractor	Contractor
8	as req'd	3" 90° Bend	400-4021	Contractor	Contractor
9	as req'd	Pvc Cement	141-1044	Contractor	Contractor
10	as req'd	Twine for #8 Polypropylene	106-0420	Contractor	Contractor

Reference Drawings

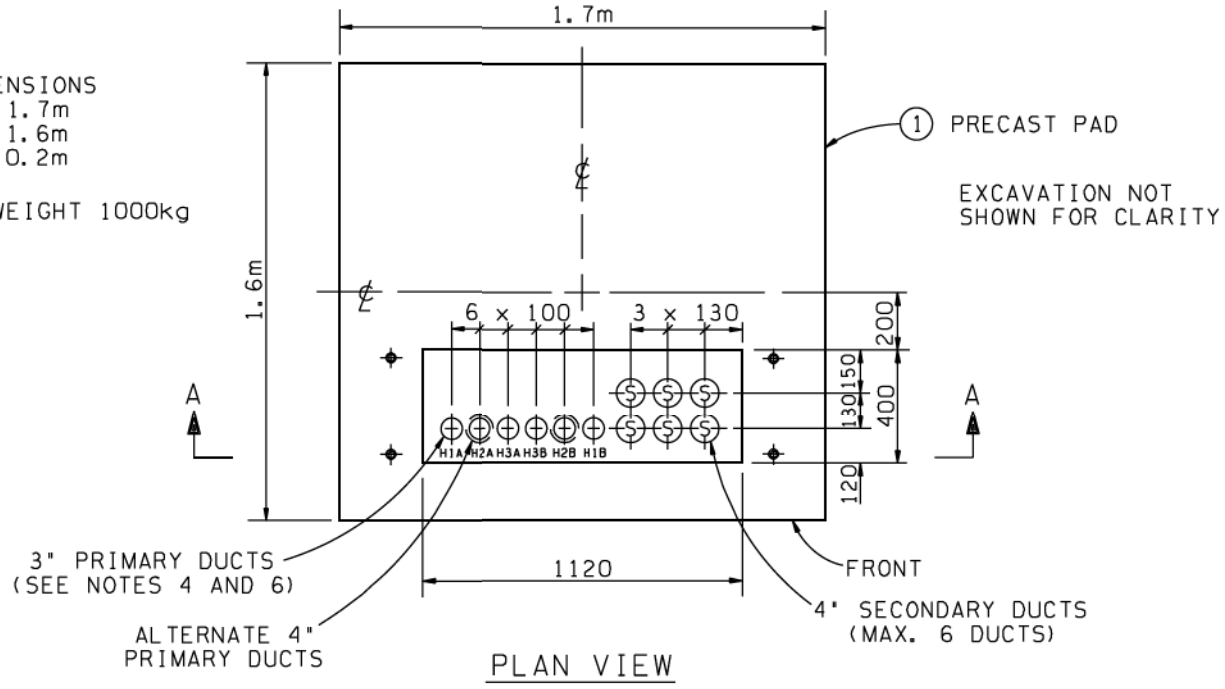
ES54 U5-01	Pads Located by Road or Ditch		
ES54 U4	Installation in Unstable Ground		
ES54 U2-02	Stanchions		
ES54 R1	Grounding	ES53 U1-04	Cable Pulling Parameters
ES54 H1-06	Duct Entry Details	ES53/54 Z2-01	Duct and Accessories

DRAFTER	DESIGNER	APPROVED	SINGLE PHASE LOW PROFILE TRANSFORMER PRECAST CONCRETE PYRAMID PAD INSTALLATION DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: DECEMBER 1979			

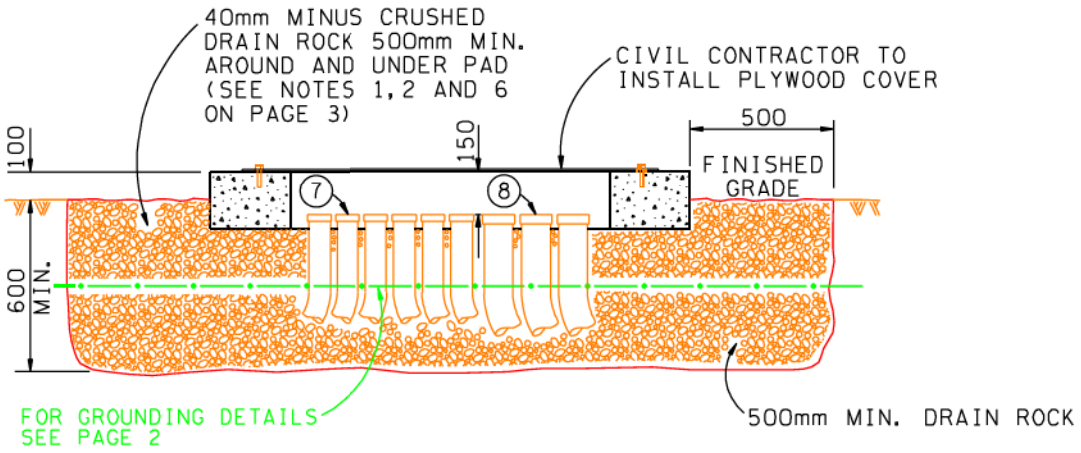
REVISED

PAD DIMENSIONS
WIDTH: 1.7m
LENGTH: 1.6m
HEIGHT: 0.2m

APPROX. WEIGHT 1000kg



PLAN VIEW



SECTION A-A

INSTALLATION DETAILS

NOTES:

1. For general trenching details see ES54 H1-01/02.
2. For installation in unstable ground see ES54 U4.
3. There shall be no vegetation or pavement over the drain rock around the pad.
4. For radial connected units, use only ducts located in H1A, H3A and H2B postion.
5. Designer is to specify orientation of pad to allow for safe operating position for crews.
6. H1A, H2A, H3A are incoming source side ducts.
   H1B, H2B, H3B are outgoing load side ducts.

CUG: PD "X" "Y"
"X" - Number of 3" bends
"Y" - Number of 4" bends

DRAFTER	DESIGNER	APPROVED	3 PHASE PMDF TRANSFORMER, 500kVA AND SMALLER PRECAST CONCRETE PAD INSTALLATION DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1999			

REVISED | R4-REDONE JAN. '05 FK

SECTION H - DUCT

REVISED | R. 2- REDONE. OCT. '02 MF

DRAFTER	DESIGNER	APPROVED
DM	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: JUNE 1980

1. TYPES OF DUCT

Three types are presently being used:

i)	URD/UD	Rigid PVC, grey - CSA DB2 as per CSA C22.2 No. 211.1 M1984 - supplied by contractor / developer (for 3" and 4" non-feeder work) except for iii) below
ii)	FEEDER	Rigid PVC, grey - as per BC Hydro Spec.400-4000 - supplied by BC Hydro (for 4" and 5" feeder work)
iii)	BRIDGE CROSSINGS OR HIGH PULLING TENSION URD/UD BENDS (see clause 9)	Rigid fibreglass reinforced epoxy (FRE)

For standard ducts and duct accessories see ES53/54 Z2-01.

2. HANDLING OF DUCT AND FITTINGS

PVC duct and fittings are very ruggedly constructed and will not break or crack under normal use. However, when exposed to sunlight for long periods of time (generally greater than one year), they will become brittle. Therefore, any ducts or fittings stored outside must be used on a "first-in--first-out" basis. As well, when the outside temperature falls below -10°C, precautions should be taken to prevent sharp blows such as dropping the duct to the ground or backfilling immediately above the duct with large rocks.

3. PRIMARY DUCT IN PROXIMITY TO SECONDARY, TELUS AND SERVICE BOXES

Preferably, primary duct should be routed alongside secondary service boxes. If necessary, they may pass under secondary service boxes, provided a 50mm minimum vertical separation is maintained. Never, under any circumstances, take the primary duct through a secondary service box.

For separation between BC Hydro ducts and other utilities see ES54 H4.

4. DUCT FILL (PULL-THROUGH CAPABILITY)

Drawing ES53 U1-01 in the Underground Electrical Distribution Standards Book lists appropriate duct sizes for all standard cables. Do not over-size the duct – it may result in jamming.

5. WARNING TAPE (STOCK NO. 394-0680)

Warning tape is to be installed at a height of 0.4m - 0.6m above the duct. The following 3 points should be kept in mind:

a) A backhoe operator may hit the duct before seeing the tape, if he is reaching over the duct and pulling the shovel up and towards him.

b) The tape should not be used as a substitute for keeping up-to-date records of all duct locations.

c) The tape should not preclude the practice of contractors inquiring at the local BC Hydro office about possible duct installations in the vicinity of their excavation work.

6. CONCRETE ENCASEMENT OF DUCTS

Feeder cables are generally to be concrete encased in a formed duct bank. (See ES54 H2). Exceptions to the above, such as wild poured concrete or direct buried ducts installed with spacers may be allowed when so approved by the BC Hydro Engineer in charge of the project.

Concrete encasement is generally not required for UD, URD as well as for service ducts.

In installations where pulling tensions are higher than 5.5 kN and side-wall bearing pressure on midsection bends exceed 3.3 kN/m, concrete encasement is requried at the duct bend and the duct sections adjacent to the bend.

Concrete encasement or other means of locating the duct bend is also required at LPT pyramid pads and some other pads whenever the evaluated cable pulling tension exceeds a value of 0.8kN. (see ES54 F1-03)

Terminal pole pilasters must always be concrete encased.

Concrete encasement may also be required for crossings of roads, railroad tracks or other utilities.

Ducts installed on steep slopes or ditches, where standard back-fill might disappear due to erosion, will require reinforced concrete encasement.

Concrete encasement may also be required as specified by municipal authorities.

Special attention must be given to the transition between concrete encased and direct buried sections of duct to prevent excessive shear stress due to soil settlement force differentials (see ES54 U4 section).

7. PULLING TWINE

The contractor shall install pulling twine (BC Hydro Stock No. 106-0420) into all new ducts and secure it on both ends of the duct runs.

Pulling twine is generally blown through the ducts with a compressor and a parachute.

Care must be taken that the twine does not cut into the duct wall due to excessive friction.

Also, pulling twine must not be blown into energized BC Hydro equipment, such as transformer pads, junction kiosks and boxes, unless the procedure is approved and monitored by the BC Hydro Civil Inspector.

8. PVC DUCT CEMENT

All PVC ducts and duct accessories shall be glued with PVC adhesive (BC Hydro Stock No. 141-1044).

Make sure the engaging ends to be glued are wiped clean prior to applying the adhesive.

Once the adhesive has been brushed on to both surfaces the two parts must be pushed together firmly until the parts are fully engaged.

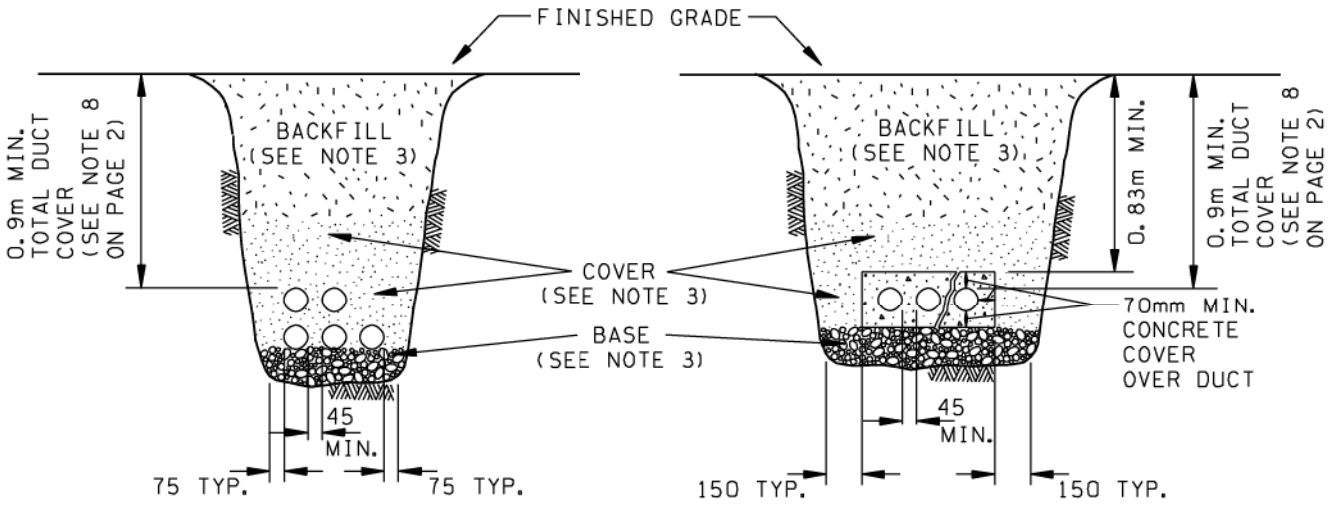
Make sure to use enough adhesive, but not so much such that it oozes out at the ends, and possibly affects the cable pull.

9. PVC TO FIBERGLASS REINFORCED EPOXY (FRE) DUCT

Whenever connections between PVC and FRE ducts or bends have to be made, special couplings need to be applied. For 75mm (3") ducts use "e-loc coupling EL-350" and for 100mm (4") use "e-loc coupling EL-400".

Also, whenever the pulling tension on the cable exceeds the value of 3.5kN/m, replace the PVC bend with a fibreglass reinforced epoxy bend c/w a PVC coupling.

The BC Hydro stock numbers for the bends are: 96001123 for 75mm (3") duct
96001124 for 100mm (4") duct.



NOTES:

1. Concrete encasement is not required unless specified by B.C. Hydro designer. For details on concrete see BC Hydro class of work specification no. 1321 or no. 1323 as applicable.
2. For standard concrete encasement cross sections see drawings ES54 H2-01 and H2-02.
3. For details on backfill cover and base materials, compaction and surface restorations see BC Hydro class of work specification.
4. All ducts in UD installations must be proven by drawing an approved mandrell through them at the time of construction. See BC Hydro class of work specification.
5. A pulling twine (stock no. 106-0420) shall be left in all ducts in both URD and UD installations. For URD the twine may be laid in during or blown in after installation. For UD installations the twine is generally pulled in behind the mandrell.
6. For installations located on a grade where water flow may carry away the base material, drain rock should be substituted for the sand. For details of the drain rock see BC Hydro class of work specification.
7. Any field cut PVC duct or bends must have their inside edges bevelled smooth by sanding to prevent damage to cables during pulling operations.

REVISED | R2-REDRAWN & REV. DEC. '00 MF

DRAFTER	DESIGNER	APPROVED	DUCT GENERAL TRENCHING DETAILS URD AND UD INSTALLATIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			

8. The total cover for secondary and service duct, when primary duct is not present, may be reduced to a minimum 0.6m for direct buried and 0.53m for concrete encased duct, except at locations subject to road traffic.
9. In areas where there is not a natural slope in the run, raise the midpoint of the run 0.15m above the two extremities for draining water from the duct.
10. For reinforcing details of concrete encased duct, see drawing ES54 H2-04.
11. For dimensions at window openings in underground chambers, see drawings ES54 H1-06 and ES54 H3-01.
12. For clearance to other utilities, see drawing ES54 H4-01.
13. For repair of pvc duct, see drawing ES54 H5-01.

REFERENCE DOCUMENTS

BC Hydro class of work specification no. 1323 "Builder installation of underground structures for electric distribution system".

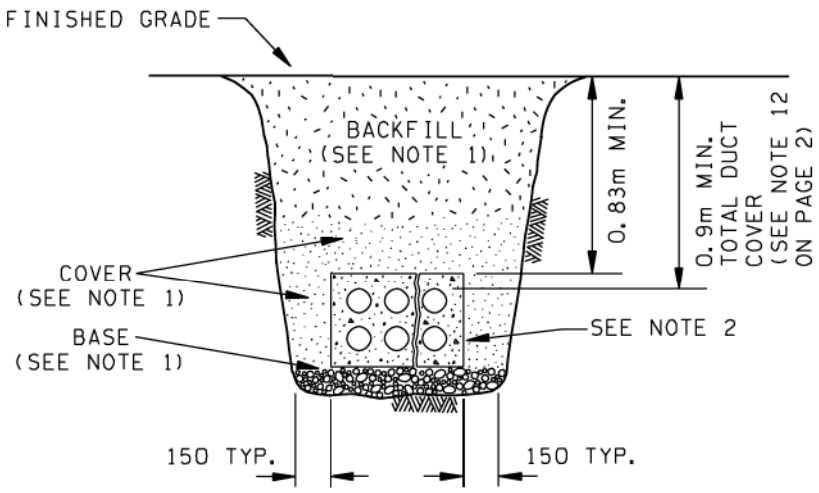
BC Hydro class of work specification no. 1321 "Construction of underground electric distribution structures and installation of electrical equipment by BC Hydro contractor".

REFERENCE DRAWINGS

ES54 H5-01	Pvc Duct Repair
ES54 H4-01	Clearances to other Utilities
ES54 H3-01	Window Opening in u/g Chambers
ES54 H2-04	Reinforcing
ES54 H2-03	125mm (5") Duct
ES54 H2-02	100mm (4") Duct
ES54 H2-01	75mm (3") Duct
ES54 H1-06	Duct Entry Details

DRAFTER	DESIGNER	APPROVED	DUCT GENERAL TRENCHING DETAILS URD AND UD INSTALLATIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			

REVISED



TYPICAL TRENCH CROSS SECTION

NOTES:

1. For details on backfill cover, base materials, compaction and surface restorations, see BC Hydro class of work specification.
2. For details on concrete and duct installation see BC Hydro class of work specification no. 1322. For standard cross sections, see drawings ES54 H2-02 and ES54 H2-03.
3. All ducts must be proven by drawing an approved mandrell through them at the time of construction. See BC Hydro class of work specification.
4. A pulling twine (stock no. 106-0420) shall be left in all ducts. The twine is generally pulled in behind the mandrell.
5. A disposable measuring duct tape such as Greenlee catalogue no. 435 shall be pulled into one of the ducts along with the twine. The actual length of the duct twine shall then be recorded on the civil drawing, so that the correct cable length may be pulled in. The tape may be left in the duct until cable is pulled in.
6. Any field cut pvc duct or bends must have their inside edges bevelled smooth by sanding to prevent damage to cables during pulling operations.

REVISED | R2-REDRAWN & REV. JAN. '01 MF

DRAFTER	DESIGNER	APPROVED	DUCT GENERAL TRENCHING DETAILS FEEDER DUCT BANK INSTALLATIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			

7. In terrain without a natural slope in the run, raise the midpoint of the run 0.15m above the two extremities for draining water from the duct.
8. For reinforcing details, see drawing ES54 H2-04.
9. For additions to existing duct banks, see drawing ES54 H2-05.
10. For dimensions at window openings in underground chambers, see drawings ES54 H1-06 and ES54 H3-01.
11. For clearance to other utilities, see drawing ES54 H4-01.
12. For future size addition to the duct bank (see drawing ES54 H2-05), allow for a minimum 0.83m total cover over the top of the duct bank addition.

REFERENCE DOCUMENTS

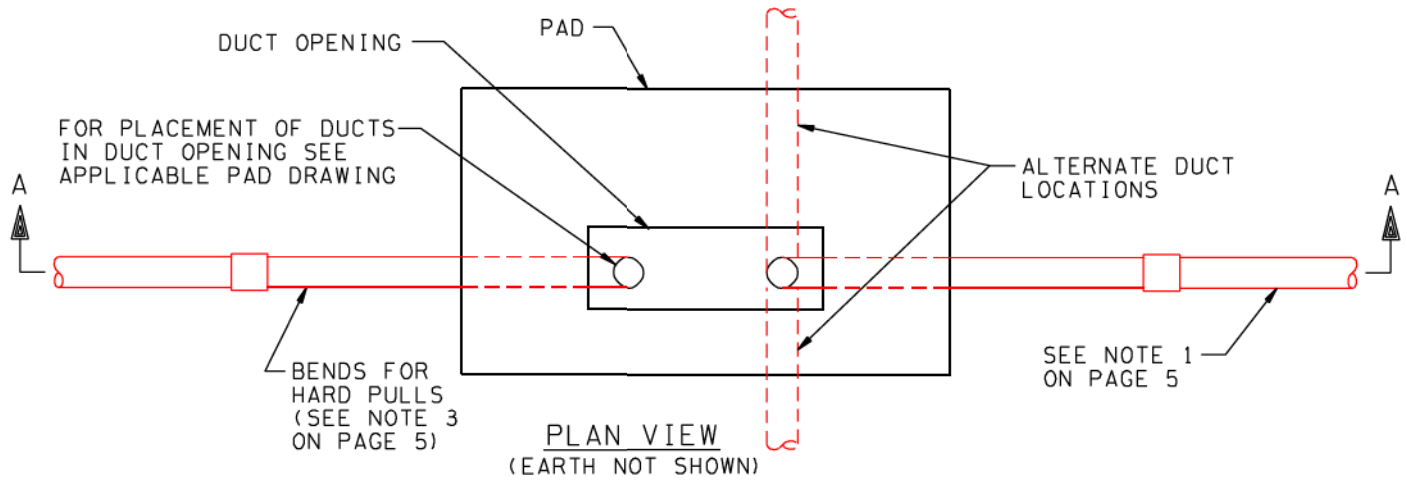
BC Hydro class of work specification no. 1322 "Construction of underground electric distribution structures by BC Hydro contractor".

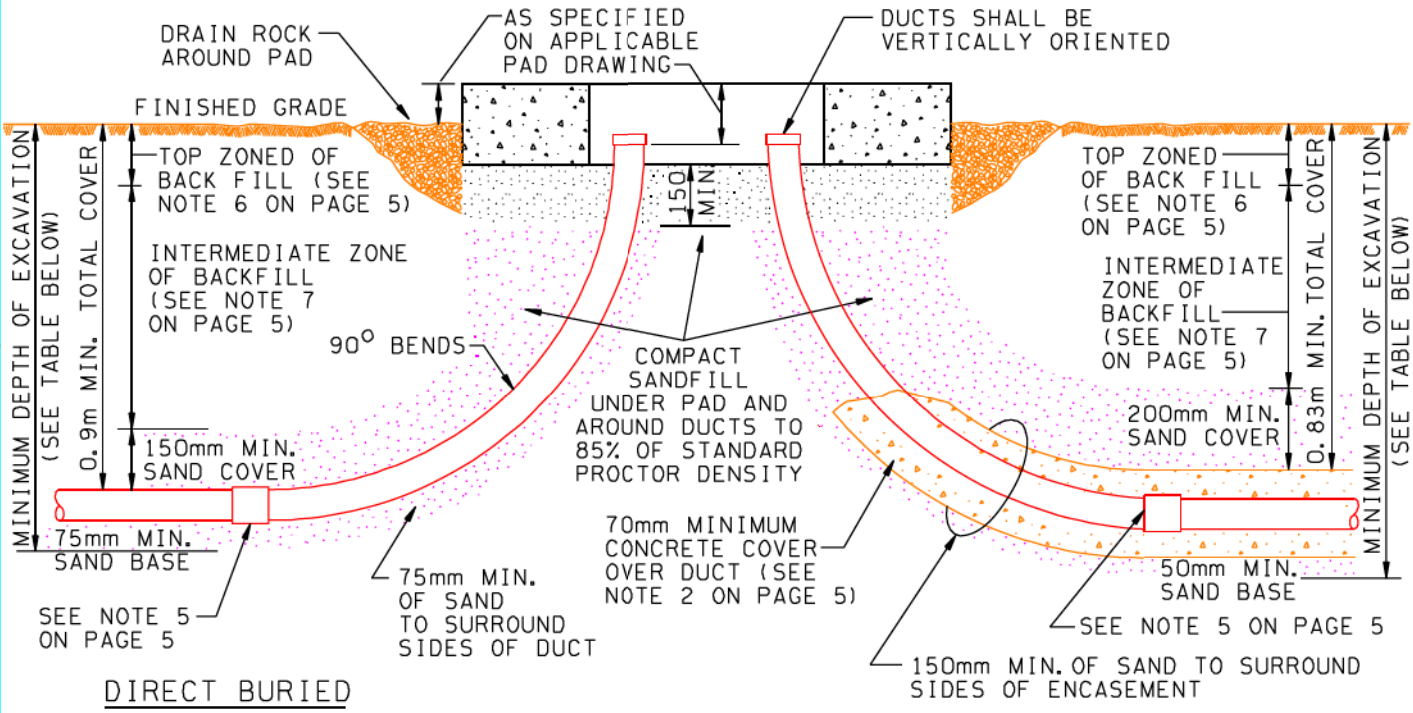
REFERENCE DRAWINGS

ES54 H4-01	Clearances to other Utilities
ES54 H3-01	Window Opening in u/g Chambers
ES54 H2-05	Additions to Existing Duct Banks
ES54 H2-04	Reinforcing
ES54 H2-03	125mm (5") Duct
ES54 H2-02	100mm (4") Duct
ES54 H1-06	Duct Entry Details

REVISED | R2-REDRAWN & REV. JAN. '01 MF

DRAFTER	DESIGNER	APPROVED	DUCT GENERAL TRENCHING DETAILS FEEDER DUCT BANK INSTALLATIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			



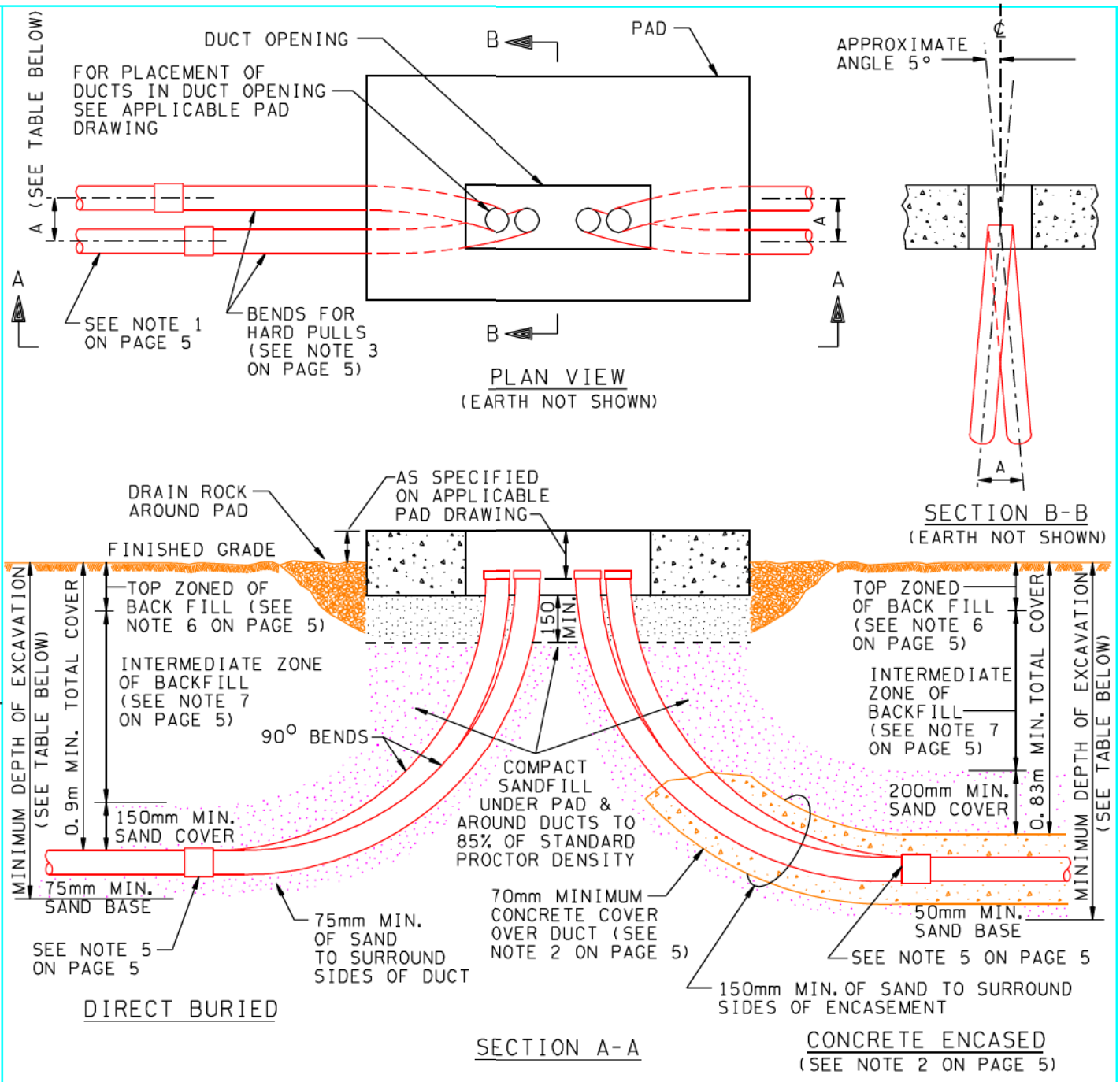


Duct Size	Minimum Depth of Trench		Minimum Width of Trench	
	Direct Buried	Concrete Encased	Direct Buried	Concrete Encased
3"	1.1m	1.1m	0.3m	0.6m
4"	1.1m	1.2m	0.3m	0.6m
5"	1.2m	1.2m	0.3m	0.6m

SINGLE DUCT OR 2 NON-ADJACENT DUCTS

DRAFTER	DESIGNER	APPROVED	DUCT ENTRIES AT PADS INSTALLATION AND TRENCHING DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1981			

REVISED | R. 1- REDRAWN. DIMENSIONS & NOTES REV. JAN. '01 MF

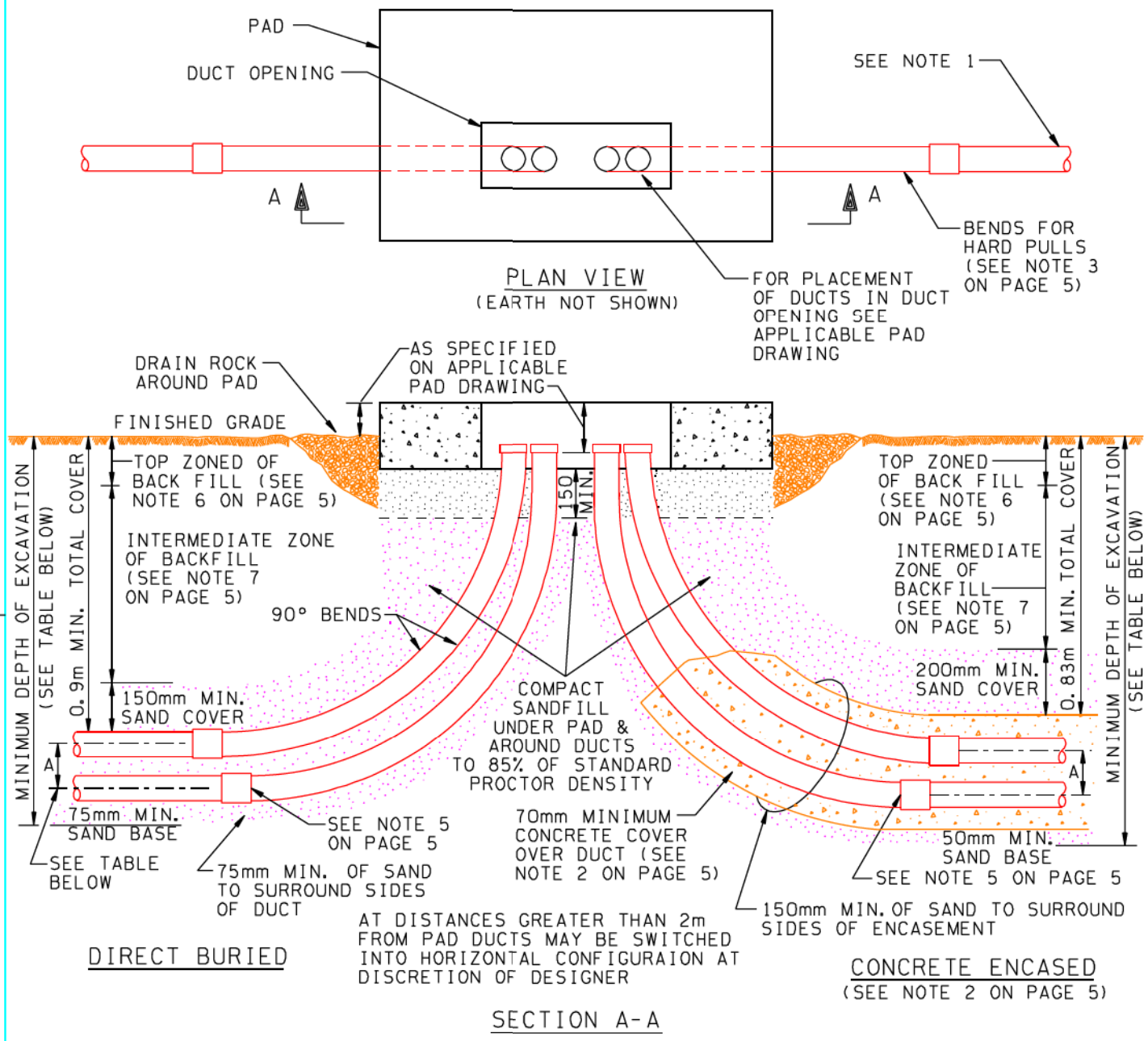


Duct Size	A	Minimum Depth of Trench		Minimum Width of Trench	
		Direct Buried	Concrete Encased	Direct Buried	Concrete Encased
3"	135	1.1m	1.1m	0.4m	0.6m
4"	160	1.1m	1.2m	0.4m	0.7m
5"	185	1.2m	1.2m	0.5m	0.8m

2 OR 2 x 2 ADJACENT DUCTS-HORIZONTAL CONFIGURATION

REVISED R.1- REDRAWN. DIMENSIONS & NOTES REV. JAN. '01 MF

DRAFTER	DESIGNER	APPROVED	DUCT ENTRIES AT PADS INSTALLATION AND TRENCHING DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1981			



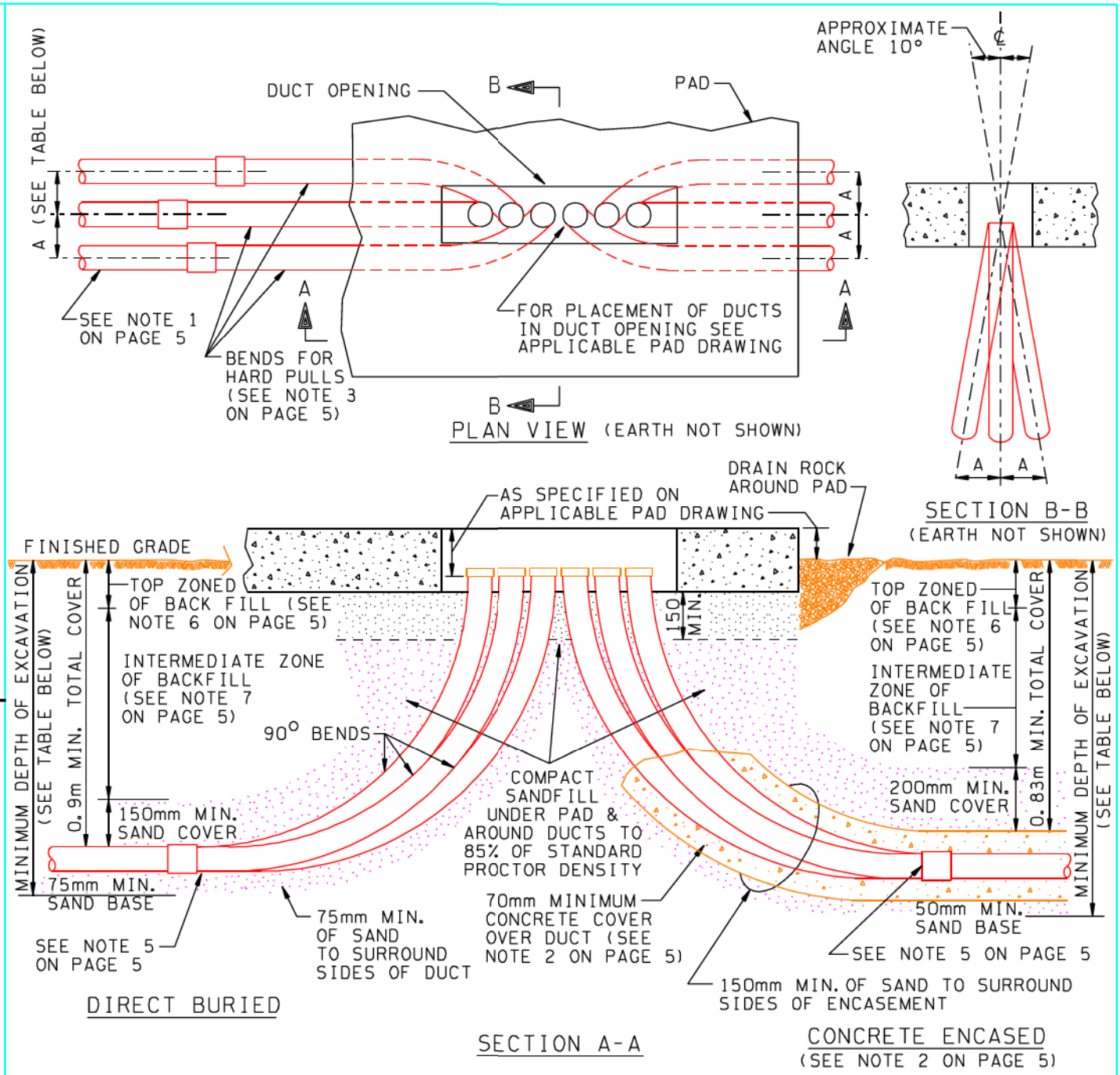
SECTION A-A

Duct Size	A	Minimum Depth of Trench		Minimum Width of Trench	
		Direct Buried	Concrete Encased	Direct Buried	Concrete Encased
3"	135	1.2m	1.3m	0.3m	0.6m
4"	160	1.3m	1.3m	0.3m	0.6m
5"	185	1.3m	1.4m	0.3m	0.6m

2 OR 2 x 2 ADJACENT DUCTS-VERTICAL CONFIGURATION

DRAFTER	DESIGNER	APPROVED	DUCT ENTRIES AT PADS INSTALLATION AND TRENCHING DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1981			

REVISED R. 1- REDRAWN. DIMENSIONS & NOTES REV. JAN. '01 MF



Duct Size	A	Minimum Depth of Trench		Minimum Width of Trench	
		Direct Buried	Concrete Encased	Direct Buried	Concrete Encased
3"	135	1.1m	1.1m	0.5m	0.8m
4"	160	1.1m	1.2m	0.6m	0.9m
5"	185	1.2m	1.2m	0.6m	0.9m

3 OR 2 x 3 ADJACENT DUCTS-HORIZONTAL CONFIGURATION

DRAFTER	DESIGNER	APPROVED	DUCT ENTRIES AT PADS INSTALLATION AND TRENCHING DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: NOVEMBER 1981			

REVISED | R. 1- REDRAWN. DIMENSIONS & NOTES REV. JAN. '01 MF

NOTES:

1. This drawing is only applicable for installation and trenching details within 2m of the pad. For trenching details at a distance greater than 2m from the pad see drawing ES54 H1-01.
2. For pulls exceeding a tension of 5.5kN, concrete encasement of ducts is required one meter outside the pad and extending within the perimeter of the pad.
3. In installations where duct sidewall bearing pressure exceeds 3.3kN/m, the following installation procedures should be followed:

(a) Install FRE bend c/w a PVC adaptor coupling.

(b) Concrete encase the PVC duct bend such that cutting of the soft PVC duct bend will not affect the cable pull.

4. Any field-cut duct or bends must have their inside edges bevelled smooth by sanding (to prevent damage to cables during pulling operations).
5. Extra caution must be taken at the coupling between the duct and the bend to ensure that the solvent cement completely covers the contact surfaces.
6. Top Zone of Backfill

Location	Minimum depth (mm)	Fill Material	Compaction (% of Standard Proctor Density)
Parking Lots	50	20mm minus combined crushed aggregate	95
Undeveloped Boulevards	50	20mm minus combined crushed aggregate	85
Developed Grass Boulevards	150	black loam	85

7. Intermediate Zone of Backfill

(a) All locations shall be backfilled with one or more of the following materials:

i) Sand free of organic materials, clay or silt. Not more than 5% by weight to pass a No. 200 mesh sieve.

ii) Combined crushed aggregate fill free of organic materials, clay or silt. The fraction retained on a 10mm sieve shall be at least 50% crushed. Not more than 5% by weight to pass a No. 200 mesh sieve.

iii) Select Backfill shall be essentially granular and shall not contain stones larger than 75mm. Not more than 5% by weight to pass a No. 200 mesh sieve.

iv) Native backfill containing rocks less than 75mm in diameter.

v) Crushed recycled glass (green or brown).

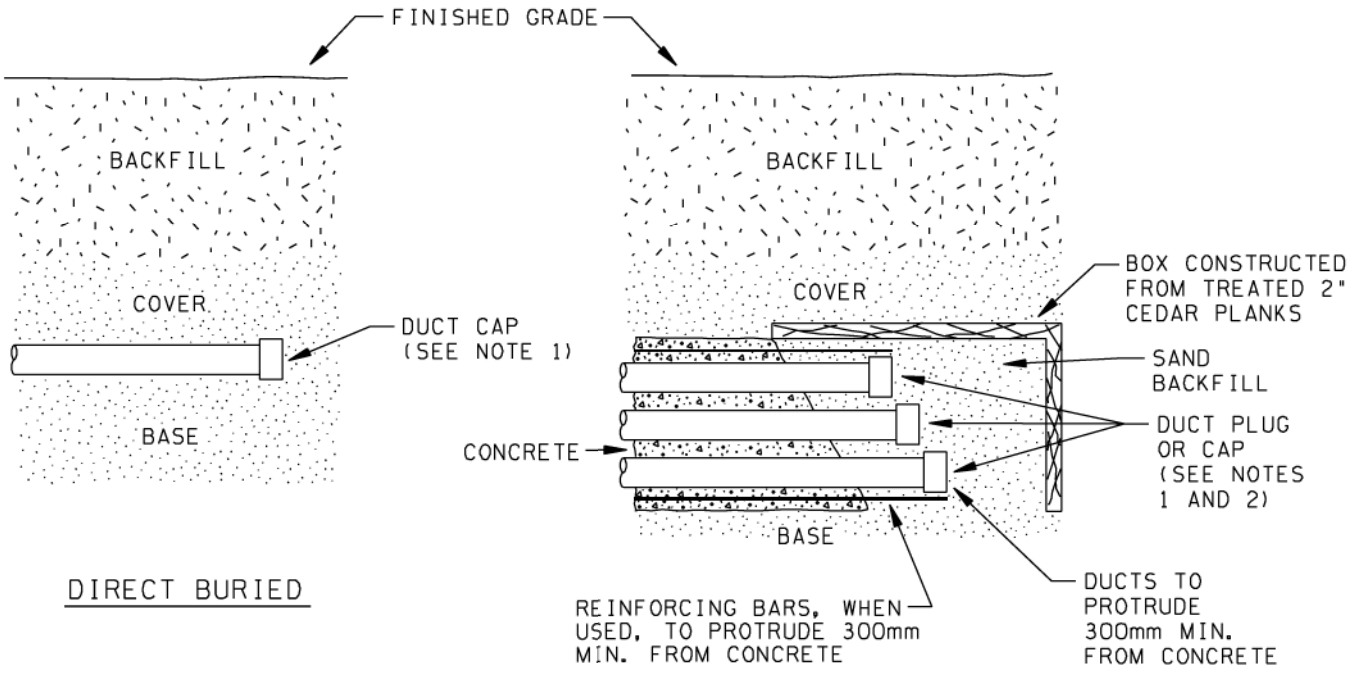
(b)

Compaction Location	Compaction (% of Standard Proctor Density)
Parking Lots	95, depth less than 1.2m
Undeveloped Boulevards	85, depth 1.2m or more
Developed Grass Boulevards	85

ES54 H1-01 URD & UD DUCTS-TRENCHING DETAILS
REFERENCE DRAWINGS

DRAFTER	DESIGNER	APPROVED	DUCT ENTRIES AT PADS INSTALLATION AND TRENCHING DETAILS
DM	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1982			

REVISED | R. 1 - REDONE. NOTES ADDED. JAN. '01 MF



NOTES:

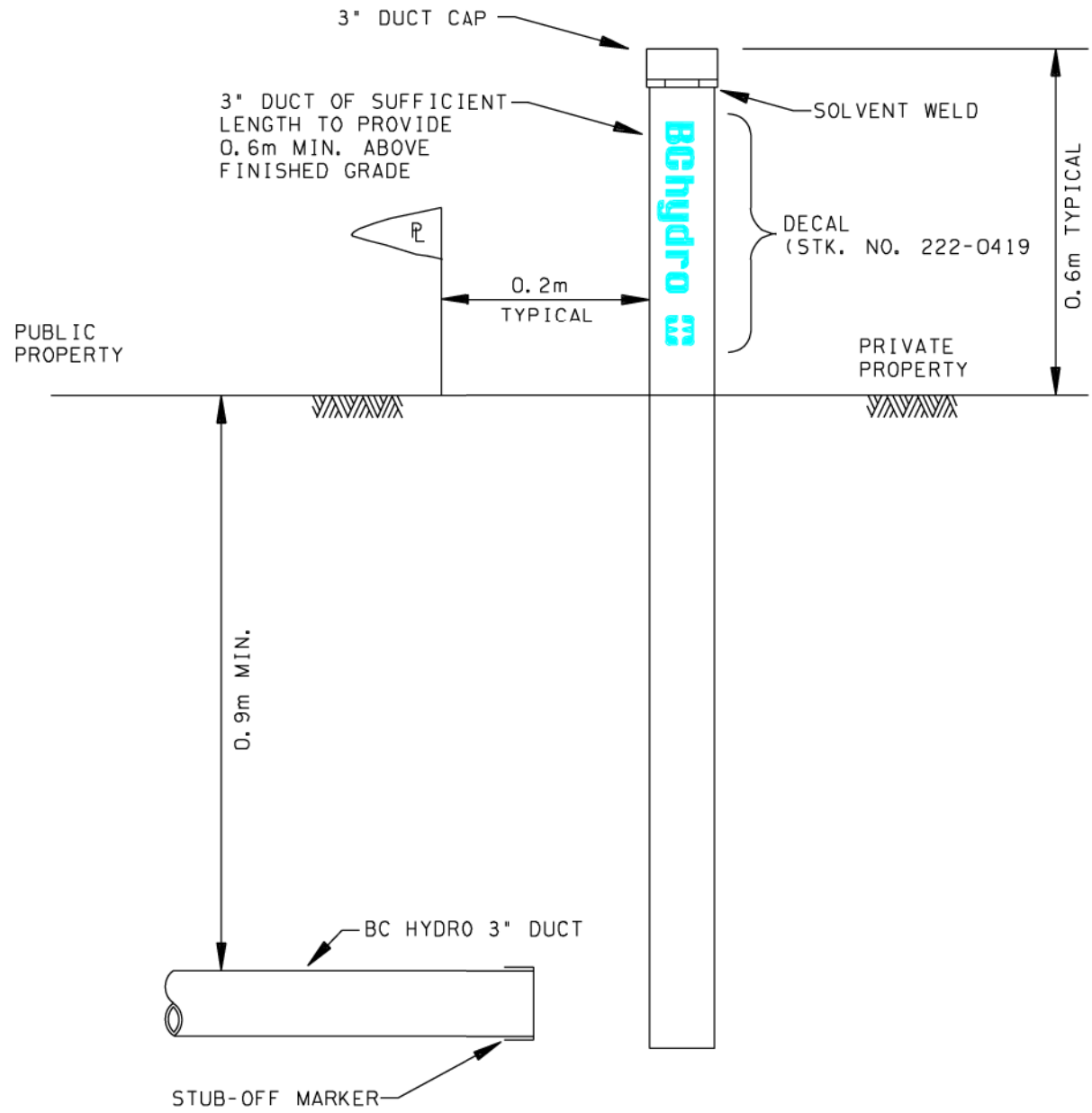
1. See drawing ES53/54 Z2-01 for stock numbers of plugs and caps.
2. Plugs can be used on both FRE and PVC duct. Caps only on PVC duct. Caps are recommended for PVC when stub-off time exceeds six months.

ES54 Z2-01 Duct and Accessories

REFERENCE DRAWINGS

DRAFTER	DESIGNER	APPROVED	DUCT STUB OFF DETAILS AT URD, UD AND FEEDER INSTALLATIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1982			

REVISED | R1-REDRAWN & REV. FEB. '01 MF

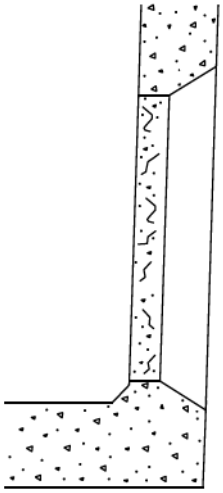


ELEVATION SECTION

MARKER DETAIL

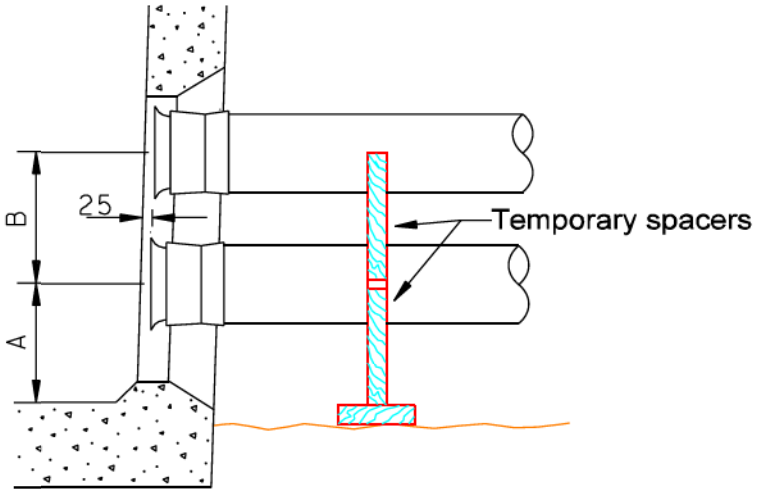
DRAFTER	DESIGNER	APPROVED	SERVICE DUCT STUB-OFF MARKER INSTALLATION
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: OCTOBER 1987			

REVISED R1-REDRAWN & REVISED MARCH '02 MF



STEP 1

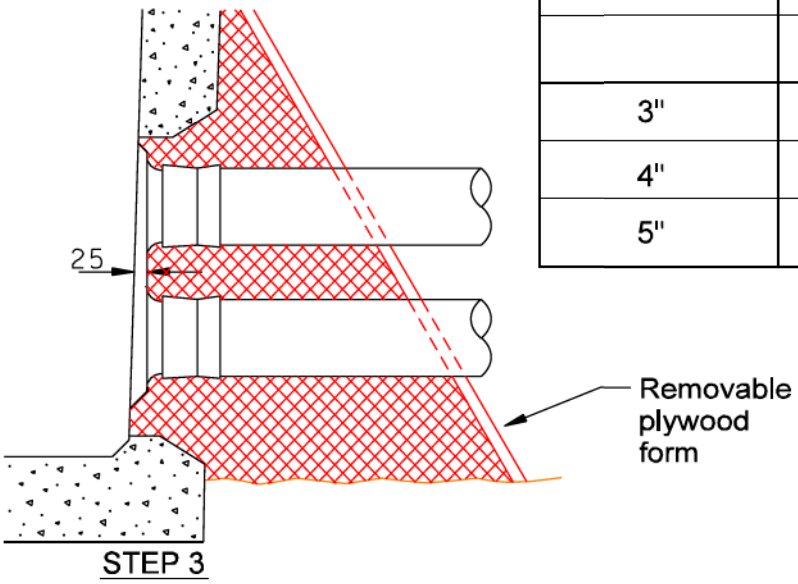
Break out knock-out as required with masonary hammer



STEP 2

Place ducts c/w bell-ends into opening maintaining proper spacing. The front of the bell end to be recessed 25mm from inside wall.

DUCT SIZES	A	B	B
		VERTICAL	HORTIZONTAL
3"	140	145	145
4"	155	170	170
5"	170	N/A	195



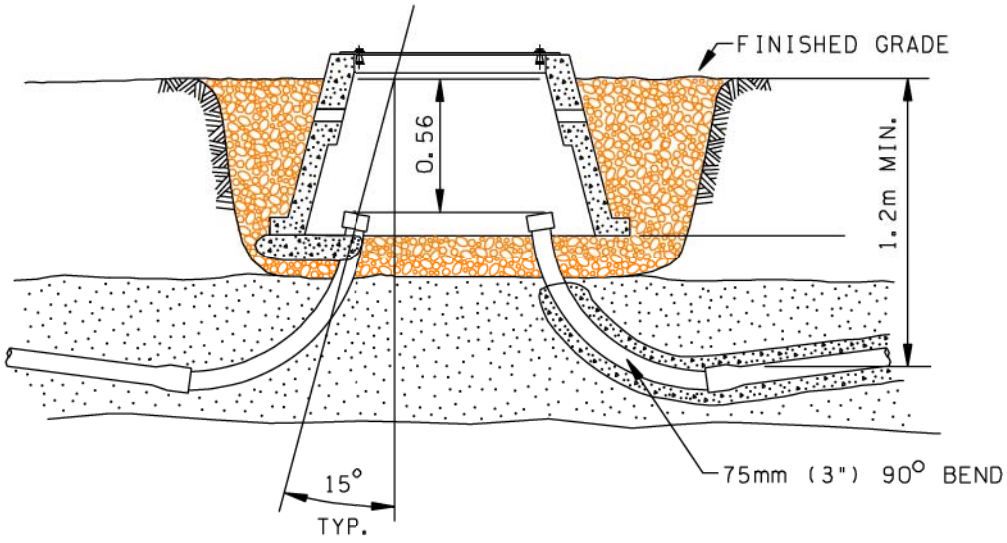
STEP 3

Seal opening with grouting mortar finishing the inside opening with a 45° recessed bevel with the inside wall.

DUCT ENTRY FOR PRECAST CONCRETE BOXES

DRAFTER	DESIGNER	APPROVED	DUCT ENTRY DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 2003			

REVISED



STEP 1

Excavate site for pad and duct entry. Install duct bends at 15° vertical offset and terminate at 0.56m below the final grade.

STEP 2

Backfill trench with sand or concrete encase duct and bends. Prepare gravel base for transformer pad.

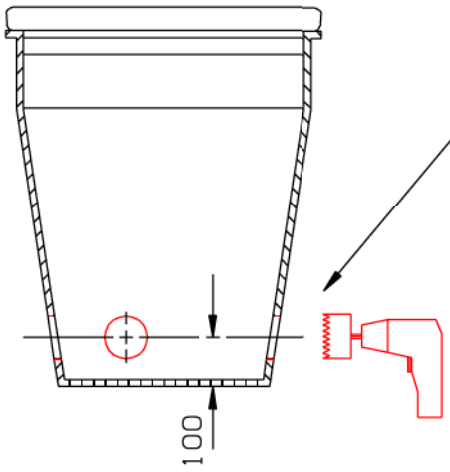
STEP 3

If calculated pulling tension exceeds 0.8kN, replace the gravel around the duct entrance and under the pad at the duct location with 25kg of ready mix concrete. For installations with a calculated duct sidewall bearing exceeding 3.3kN/m, replace the PVC duct bend with an FRE bend (see ES54 H1-03.05 note 3).

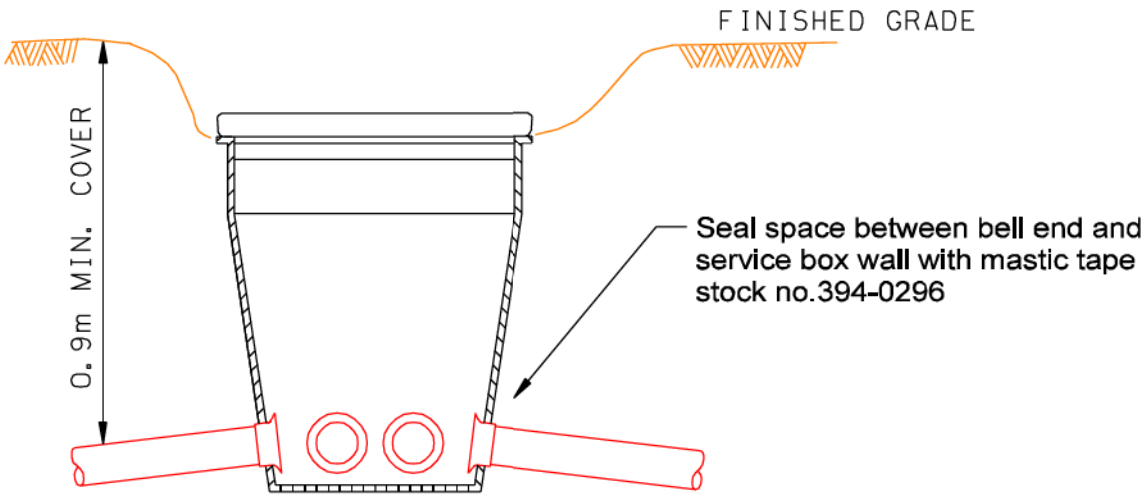
DUCT ENTRY FOR PYRAMID TRANSFORMER PADS

DRAFTER	DESIGNER	APPROVED	DUCT ENTRY DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 2003			

REVISED



STEP 1



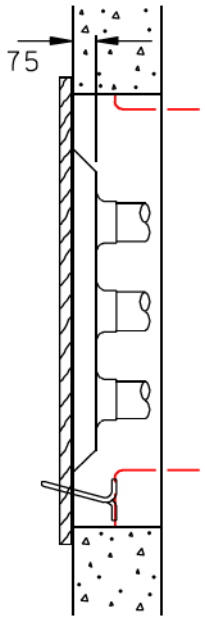
STEP 2

Lower box into ground and install ducts and bell ends

DUCT ENTRY FOR PLASTIC SERVICE BOXES

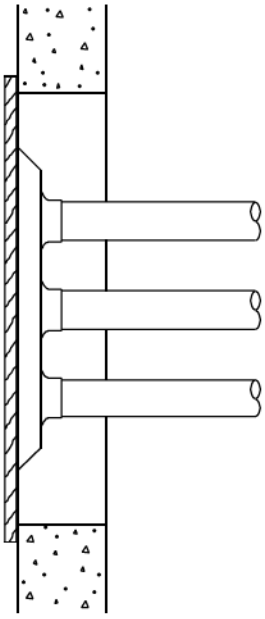
DRAFTER	DESIGNER	APPROVED	DUCT ENTRY DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 2003			

REVISED



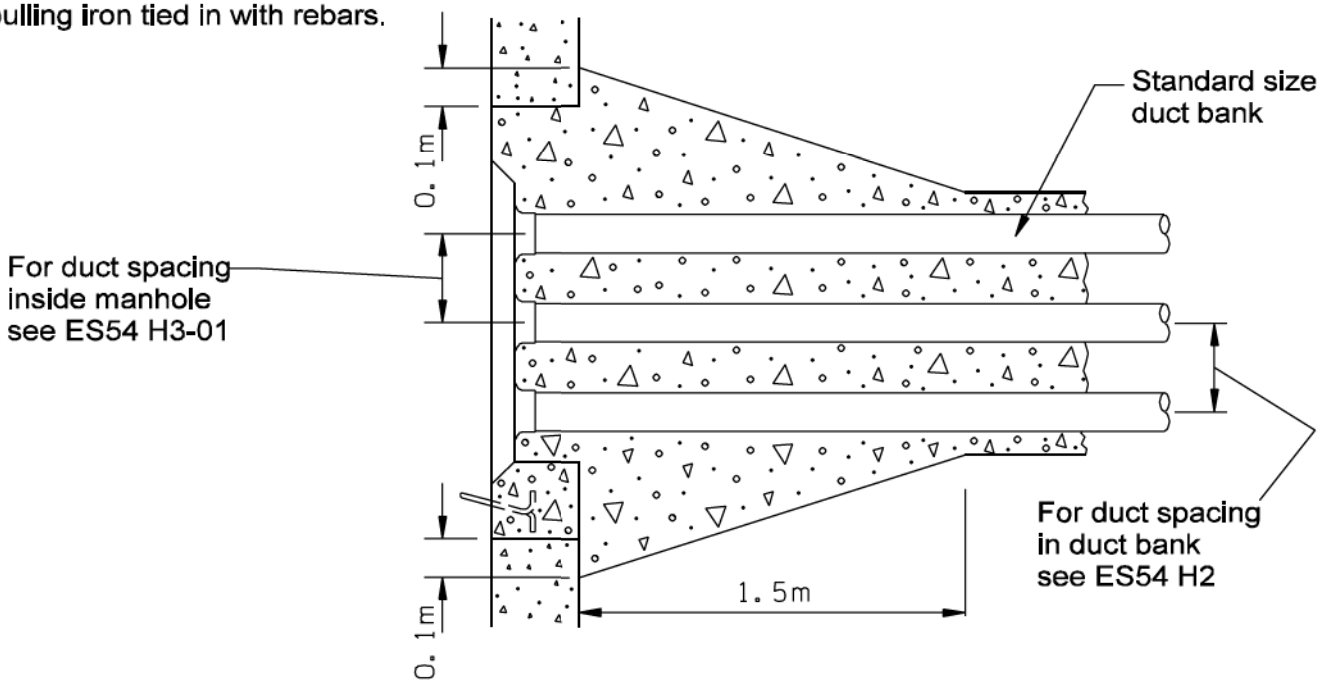
STEP 1

Cut window rebars and bend them outward. Install inside duct bank window form. Place pulling iron tied in with rebars.



STEP 2

Terminate duct bank with bell ends snug against forming.



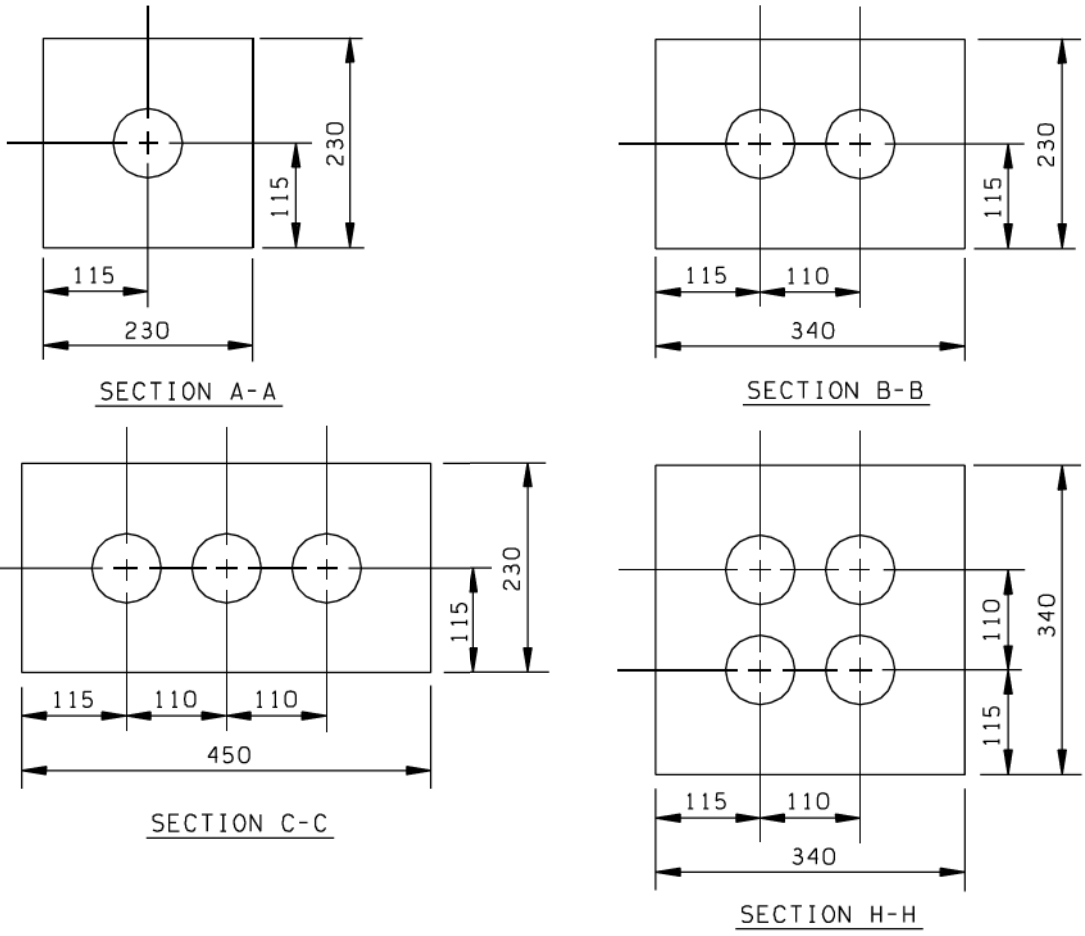
STEP 3

Form and pour duct bank window termination

DUCT ENTRY FOR VAULTS, U/G CHAMBERS AND MANHOLES WITH CONCRETE ENCASED DUCT BANKS

DRAFTER	DESIGNER	APPROVED	DUCT ENTRY DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 2003			

REVISED



NOTES:

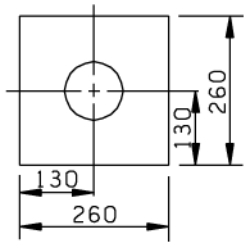
1. All cross sections shown are for 75mm (3") URD or UD PVC duct.
2. Each standard cross section is given a unique section number. It is intended that these section numbers be used on project drawings (eg. 2-75mm; section B-B) and thus eliminate the need to dimension standard duct bank cross sections.
3. For general trenching details at URD and UD installation, see drawing ES54 H1-01.
4. For reinforcing details of concrete encased duct, see drawing ES54 H2-04.
5. For additions to existing duct banks, see drawing ES54 H2-05.
6. For dimensions at window openings in underground chambers, see drawing ES54 H3-01.
7. For clearance to other utilities, see drawing ES54 H4-01.
8. Tolerances: Dimensions shown are typical only. Minimum concrete cover of 70mm and duct separation of 25mm, both vertically and horizontally, must be maintained.

REFERENCE DRAWINGS

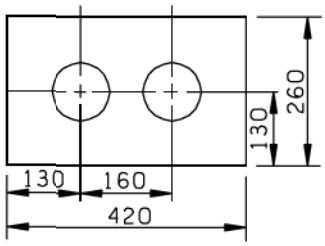
ES54 H2-05	Additions to Existing Duct Bank	ES54 H4-01	Clearances to other Utilities
ES54 H2-04	Reinforcing	ES54 H3-01	Window Opening in u/g Chambers
ES54 H1-01	General Trenching Details: URD and UD Installation		

DRAFTER	DESIGNER	APPROVED	75mm (3") DUCT CONCRETE ENCASEMENT STANDARD CROSS SECTIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1983			

REVISED | R1-DUCT SEPARATION REDUCED 1995-05-03 MF



SECTION A-A



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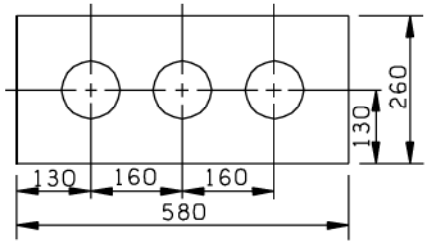

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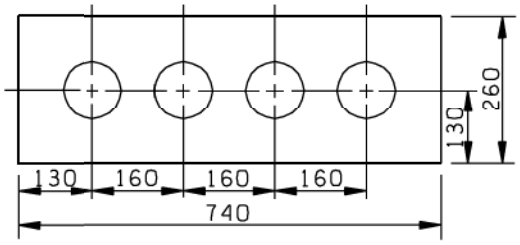
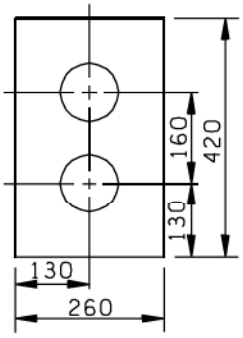
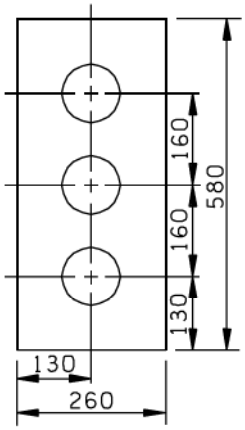


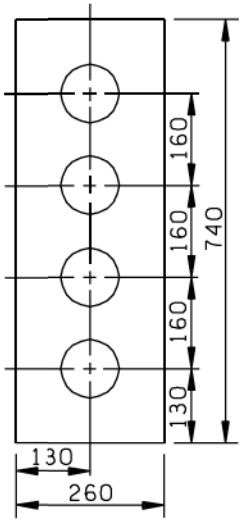
SECTION D-D



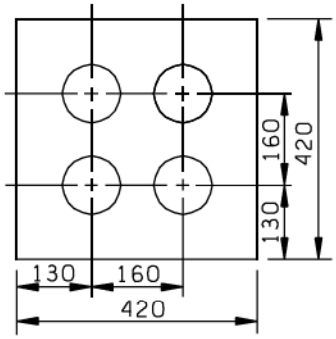
SECTION E-E



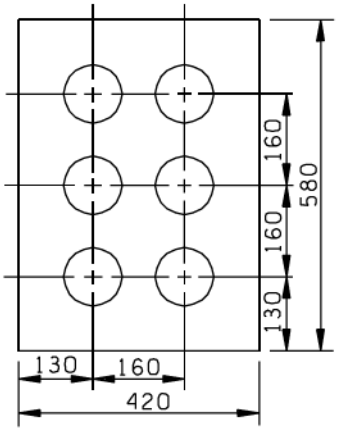
SECTION F-F



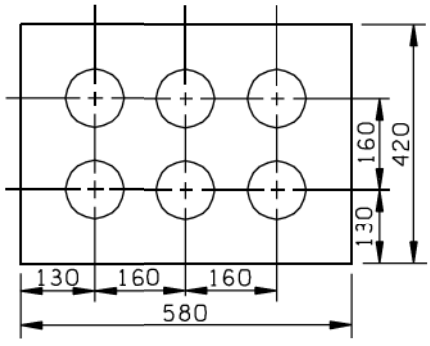
SECTION G-G



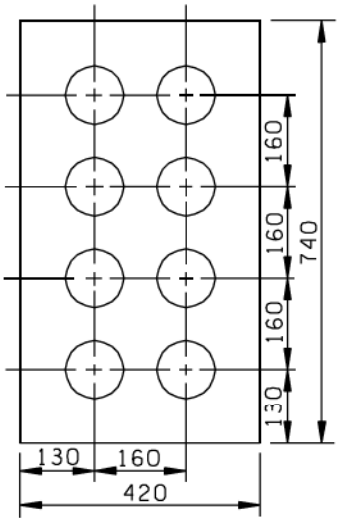
SECTION H-H



SECTION J-J



SECTION L-L



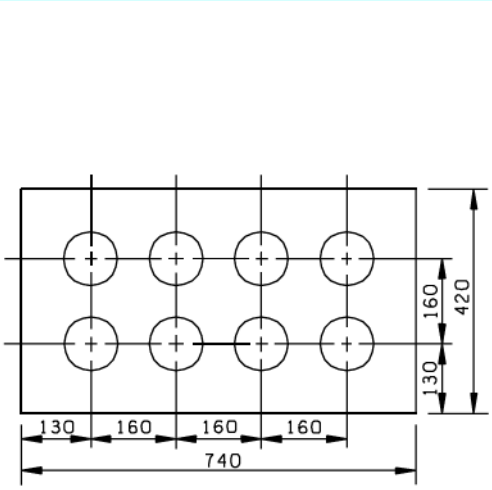
SECTION K-K

R1-DUCT SEPARATION REDUCED 1995-05-03 MF

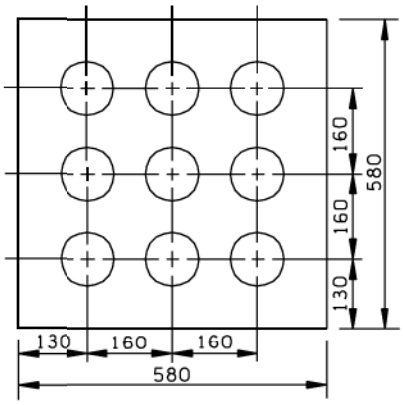
REVISED

DRAFTER	DESIGNER	APPROVED	100mm (4") DUCT CONCRETE ENCASEMENT STANDARD CROSS SECTIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1983			

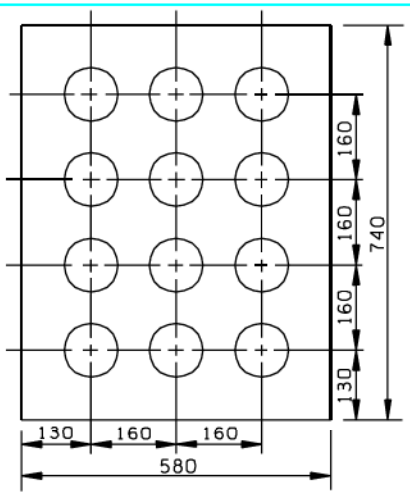
BCHydro DISTRIBUTION STANDARDS | PAGE 1 OF 2 | ES54 H2-02.01 | R. 1



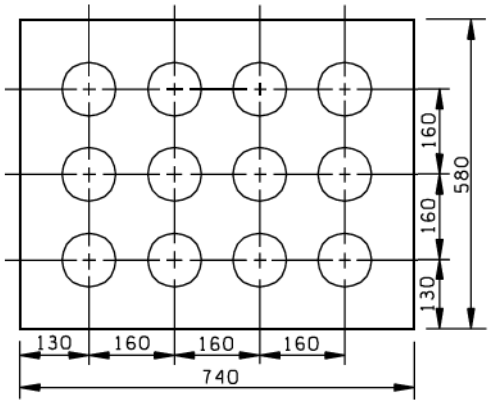
SECTION M-M



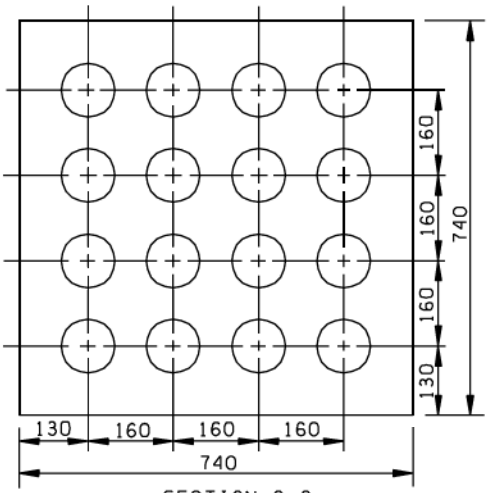
SECTION N-N



SECTION O-O



SECTION P-P



SECTION Q-Q

NOTES:

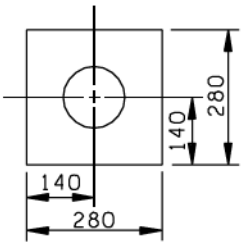
1. All cross sections shown are for 100mm (4") UD or feeder PVC duct or rigid FRE conduit.
2. Each standard cross section is given a unique section number. It is intended that these section numbers be used on project drawings (eg. 16-100mm; section Q-Q) and thus eliminate the need to dimension standard duct bank cross sections.
3. For general trenching details, see drawing ES54 H1-01 for URD and UD and ES54 H1-02 for feeder installations, respectively.
4. For reinforcing details of concrete encased duct, see drawing ES54 H2-04.
5. For additions to existing duct banks, see drawing ES54 H2-05.
6. For dimensions at window openings in underground chambers, see drawing ES54 H3-01.
7. For clearance to other utilities, see drawing ES54 H4-01.
8. Tolerances: dimensions shown are typical only. Minimum concrete cover of 70mm and duct separation of 25mm, both vertically and horizontally, must be maintained.

REFERENCE DRAWINGS

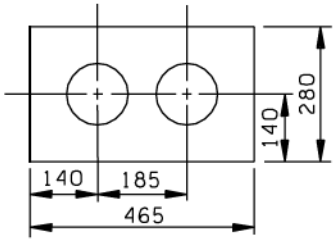
ES54 H2-04	Reinforcing	ES54 H4-01	Clearances to other Utilities
ES54 H1-02	General Trenching Details: feeders	ES54 H3-01	Window Opening in u/g Chambers
ES54 H1-01	General Trenching Details: URD and UD Installation	ES54 H2-05	Additions to Existing Duct Bank

DRAFTER	DESIGNER	APPROVED	100mm (4") DUCT CONCRETE ENCASEMENT STANDARD CROSS SECTIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1983			

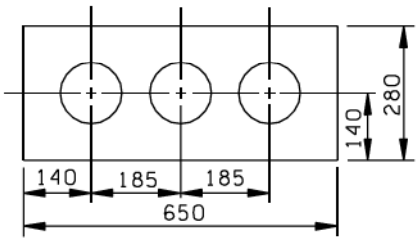
REVISED



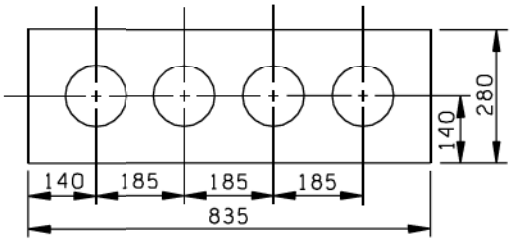
SECTION A-A



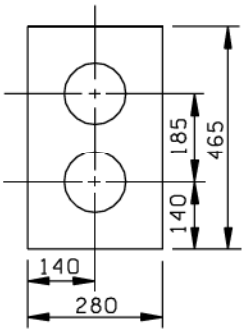
SECTION B-B



SECTION C-C



SECTION D-D



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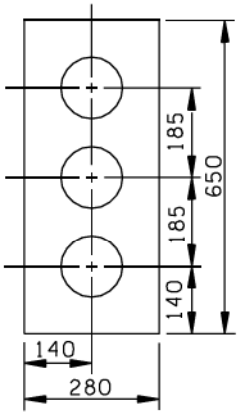
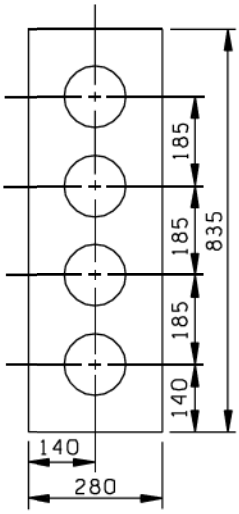
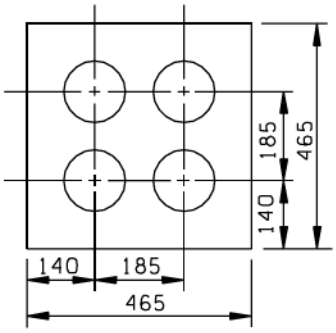


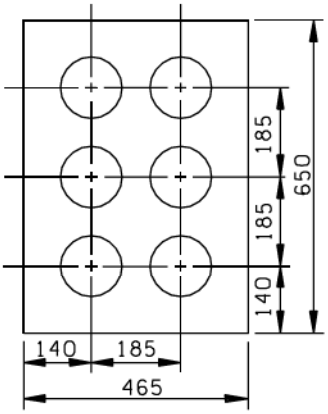
SECTION F-F



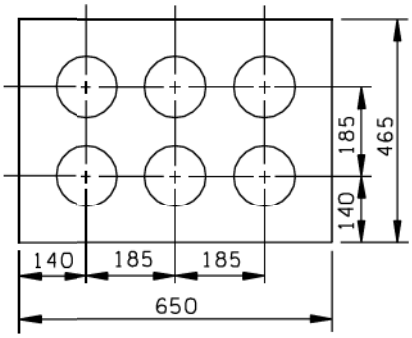
SECTION G-G



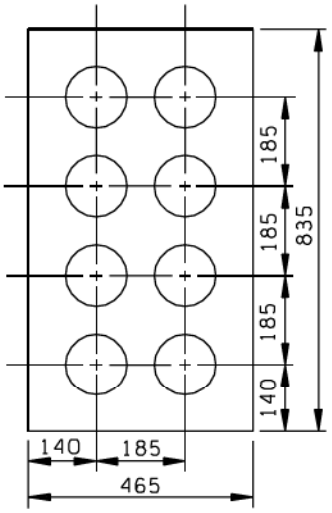
SECTION H-H



SECTION J-J



SECTION L-L



SECTION K-K

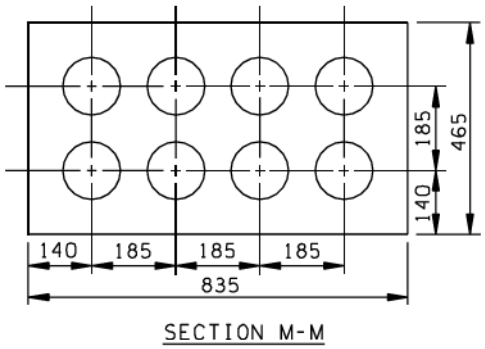
R1-DUCT SEPARATION REDUCED 1995-05-03 MF

REVISED

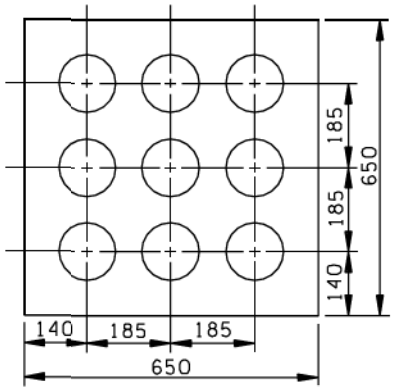
DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER
ORIGINAL ISSUE DATE: APRIL 1983		

125mm (5") DUCT CONCRETE ENCASEMENT STANDARD CROSS SECTIONS

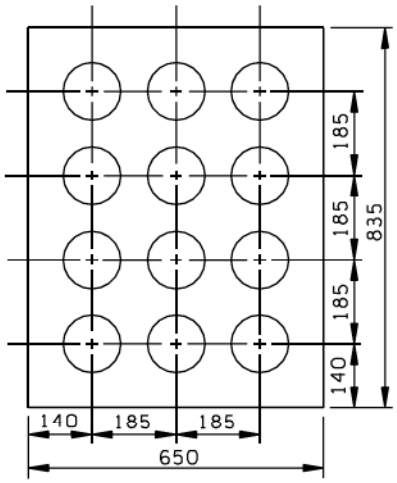
BCHydro DISTRIBUTION STANDARDS | PAGE 1 OF 2 | ES54 H2-03.01 | R. 1



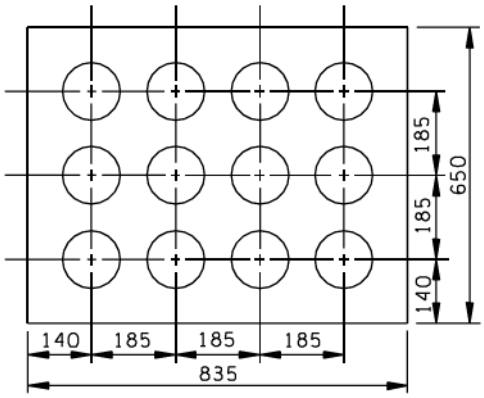
SECTION M-M



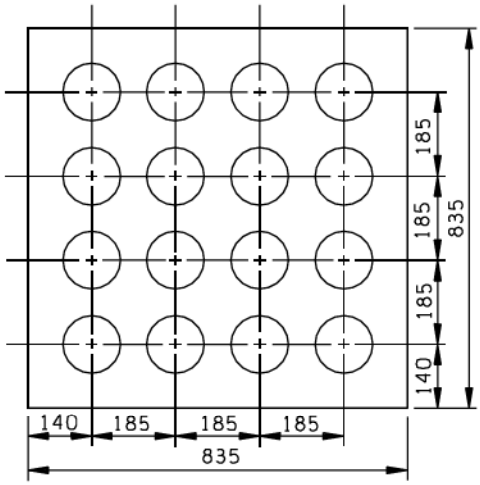
SECTION N-N



SECTION O-O



SECTION P-P



SECTION Q-Q

NOTES:

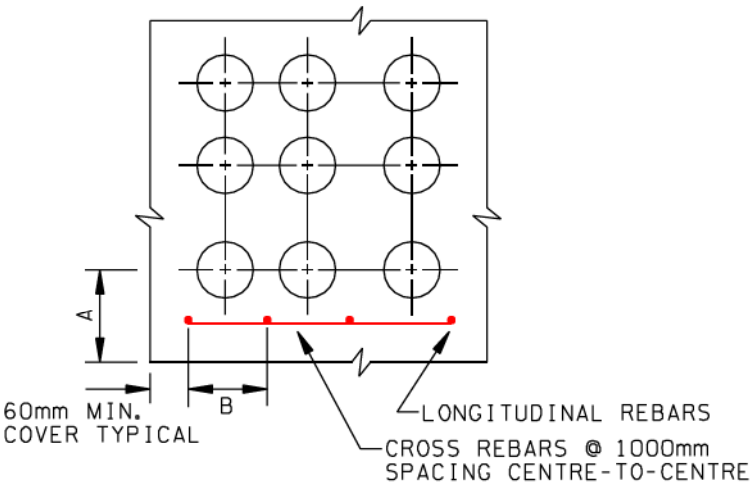
1. All cross sections shown are for 125mm (5") UD or feeder PVC duct or rigid FRE conduit.
2. Each standard cross section is given a unique section number. It is intended that these section numbers be used on project drawings (eg. 16-125mm ducts; section Q-Q) and thus eliminate the need to dimension standard duct bank cross sections.
3. For general trenching details, see drawing ES54 H1-01 for URD and UD and ES54 H1-02 for feeder installations, respectively.
4. For reinforcing details of concrete encased duct, see drawing ES54 H2-04.
5. For additions to existing duct banks, see drawing ES54 H2-05.
6. For dimensions at window openings in underground chambers, see drawing ES54 H3-01.
7. For clearance to other utilities, see drawing ES54 H4-01.
8. Tolerances: dimensions shown are typical only. Minimum concrete cover of 70mm and duct separation of 25mm, both vertically and horizontally, must be maintained.

REFERENCE DRAWINGS

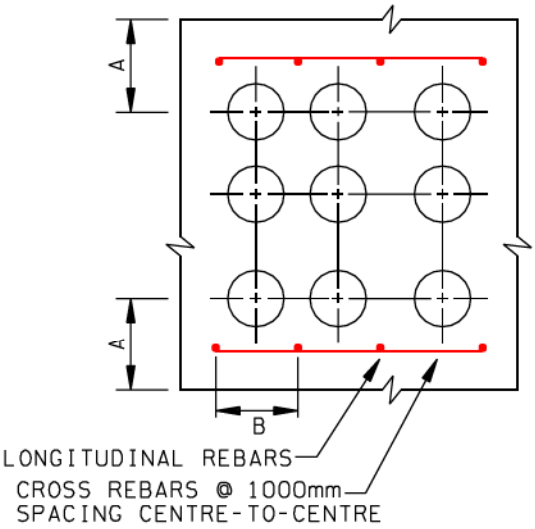
ES54 H2-04	Reinforcing	ES54 H4-01	Clearances to other Utilities
ES54 H1-02	General Trenching Details: feeders	ES54 H3-01	Window Opening in u/g Chambers
ES54 H1-01	General Trenching Details: URD and UD Installation	ES54 H2-05	Additions to Existing Duct Bank

DRAFTER	DESIGNER	APPROVED	125mm (5") DUCT CONCRETE ENCASEMENT STANDARD CROSS SECTIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: APRIL 1983			

REVISED | R1-DUCT SEPARATION REDUCED 1995-05-03 MF



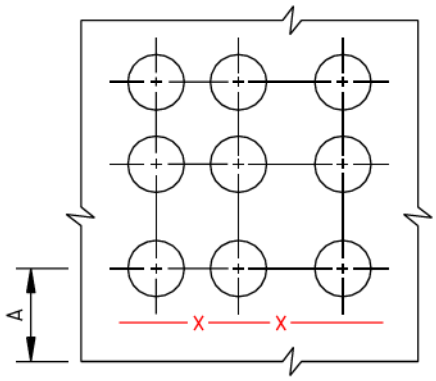
REINFORCING-BOTTOM ONLY



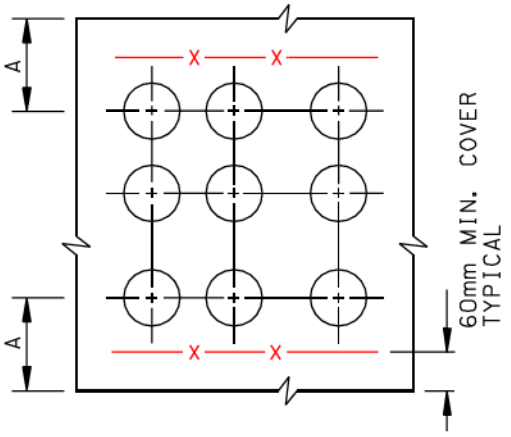
REINFORCING-TOP AND BOTTOM

REINFORCING BARS

(SEE NOTES 4 AND 5 ON PAGE 2)



REINFORCING-BOTTOM ONLY



REINFORCING-TOP AND BOTTOM

REINFORCING MESH

(SEE NOTES 4 AND 5 ON PAGE 2)

DIMENSION	DUCT SIZE		
	3"	4"	5"
A	155	170	180
B	135	160	185

REVISED | R2-REDRAWN JULY '02 MF

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: JUNE 1980

DUCT CONCRETE ENCASEMENT REINFORCING DETAILS

NOTES:

1. Dimensions between reinforcing bars are centre to centre.
2. Rebar shall be deformed, Grade 300, 10M to CSA Standard G30.12M.
3. Mesh shall be welded, 152 x 152 - MW 25.8 X MW 25.8 to CSA Standard G30.5.
4. SELECTION OF THE TYPE OF REINFORCING:
   - A) NONE - General Rule
   - B) MESH - Used wherever the base support is reasonably consistent and the loading is evenly distributed.
   - C) REBAR - Used wherever there is a point or concentrated support such as when entering a building, crossing over a storm sewer, or exiting a roadway onto a boulevard or field; or wherever there is a point or concentrated load such as under or near roadways and railways.
   - D) SPECIAL REINFORCING - (CONSULT DISTRIBUTION ENGINEERING) - Applies in areas which have an unstable base material such as peat or hog fuel, or where the number of ducts in the vertical direction exceed the number in the horizontal direction by 2 or more (e. g. Standard Cross-Sections 'F-F', 'G-G', etc. on drawings ES54 H2-03).
5. TOP AND BOTTOM REINFORCING

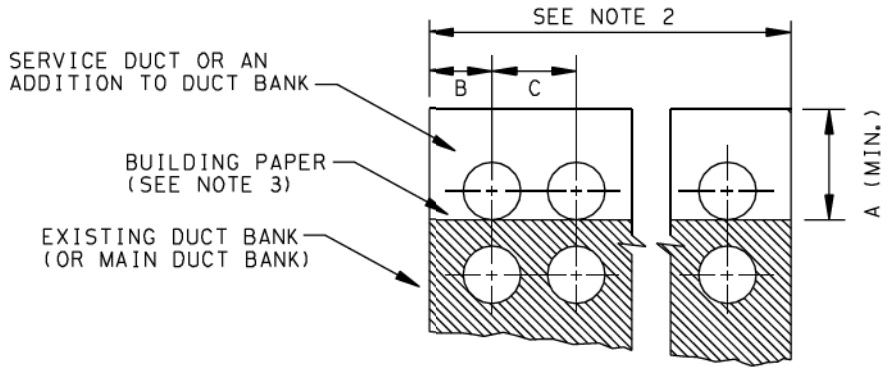
   Reinforcing top and bottom shall be used only in areas subject to severe frost heaving or where utilities are heavily conjested.
6. TOLERANCES

   Dimensions shown are typical only unless otherwise indicated. Minimum concrete cover to reinforcing of 60mm and duct separation of 45mm, both vertically and horizontally, must be maintained.
7. For dimensions between duct centres or from a duct centre to non-reinforced face see drawings ES54 H2-01, ES54 H2-02 and ES54 H3-03 for 3", 4" and 5" ducts, respectively.

ES54 H2-03 5" Duct Cross-Sections
ES54 H2-02 4" Duct Cross-Sections
ES54 H2-01 3" Duct Cross-Sections
REFERENCE DRAWINGS

DRAFTER	DESIGNER	APPROVED	DUCT CONCRETE ENCASEMENT REINFORCING DETAILS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			

REVISED



TYPICAL CROSS SECTION
(SEE NOTE 1)

DIMENSION	DUCT SIZE		
	3"	4"	5"
A (MIN.)	155	185	205
B	115	130	140
C	135	160	185

NOTES:

1. Typical cross section is shown. The addition or lateral may be added to any duct bank configuration.
2. For overall dimension of standard cross sections, see drawings ES54 H2-01, ES54 H2-02 and ES54 H2-03 for 3", 4" and 5" ducts, respectively.
3. Building paper is required both when service duct bank is constructed simultaneously with main duct bank, and when the possibility exists that the service duct banks will be broken into in future. The building paper is to be laid, and the service duct bank poured, after the main duct bank receives initial set.
4. TOLERANCES

   Dimensions shown are typical only unless otherwise indicated. Minimum concrete cover of 70mm and duct separation of 45mm, both vertically and horizontally, must be maintained.
5. The minimum total cover over the duct bank (including the addition or lateral) as shown on the general trenching drawings ES54 H1-01 and ES54 H1-02 for URD and UD installations and feeder installations, respectively, must be maintained.

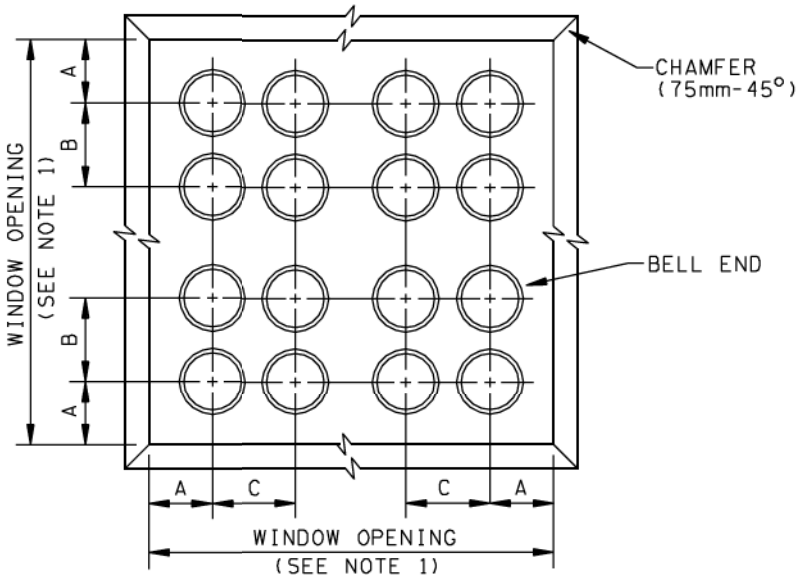
REFERENCE DRAWINGS

ES54 H2-03 5" Duct cross-sections
ES54 H2-02 4" Duct cross-sections
ES54 H2-01 3" Duct cross-sections
ES54 H1-02 General trenching details-feeders
ES54 H1-01 General trenching details-URD and UD

REVISED | R1-REDRAWN JULY '02 MF

DRAFTER	DESIGNER	APPROVED	DUCT-CONCRETE ENCASEMENT SERVICE DUCTS AND/OR ADDITIONS TO DUCT BANKS TYPICAL CROSS SECTIONS
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			

BC hydro DISTRIBUTION STANDARDS | PAGE 1 OF 1 | ES54 H2-05 | R. 1



DIMENSION	DUCT SIZE		
	3"	4"	5"
A (MIN.)	115	180	205
B	205	230	255
C	145	170	195

NOTES:

1. The overall dimensions of duct window shall be governed by bank size.
2. The vertical separation between ducts shall be gradually reduced to the values shown on drawing ES54 H2-01/03 for 3", 4" and 5" duct respectively over the first 6m from the vault, chamber or manhole.
3. TOLERANCES

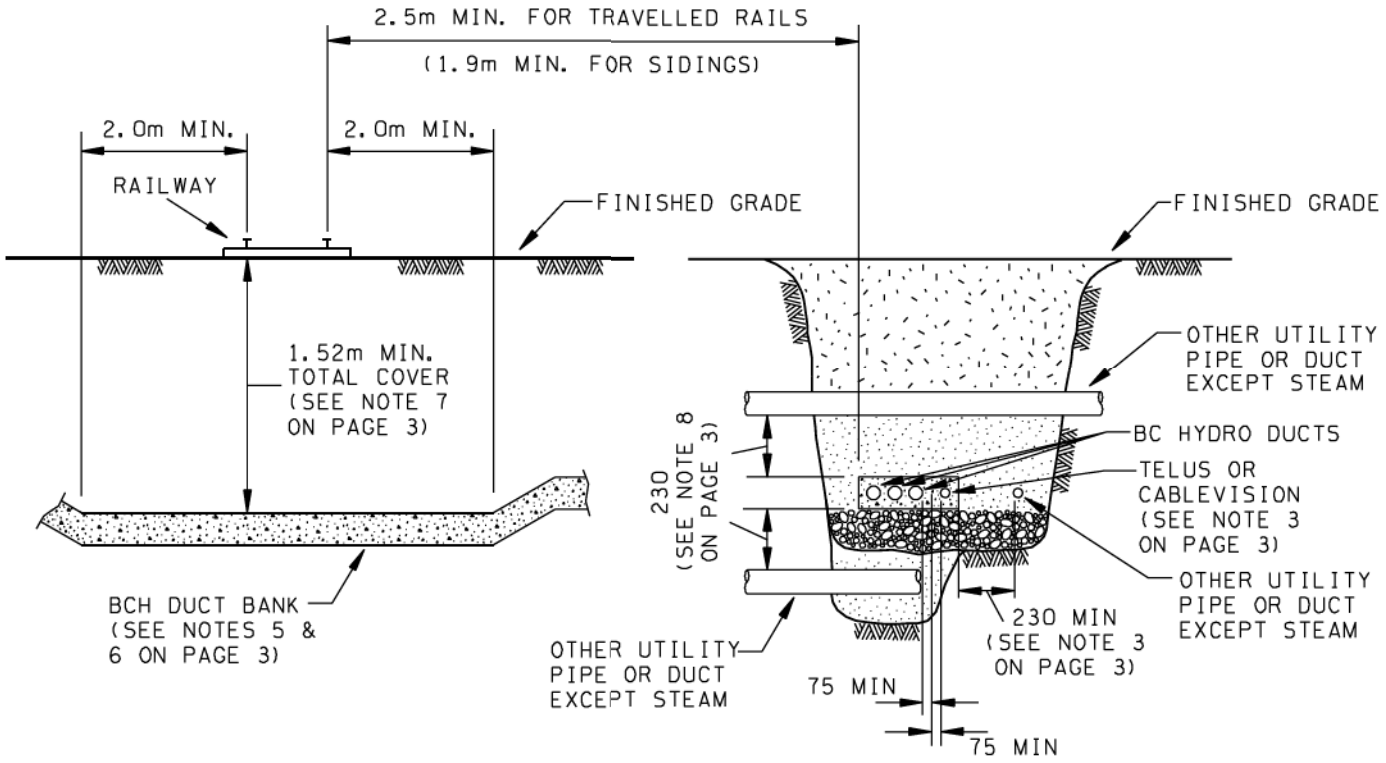
   Dimensions shown are typical only. A minimum concrete cover of 70mm and duct separation of 45mm, both vertically and horizontally, must be maintained.

ES54 H2-03 5" Duct cross-sections
ES54 H2-02 4" Duct cross-sections
ES54 H2-01 3" Duct cross-sections

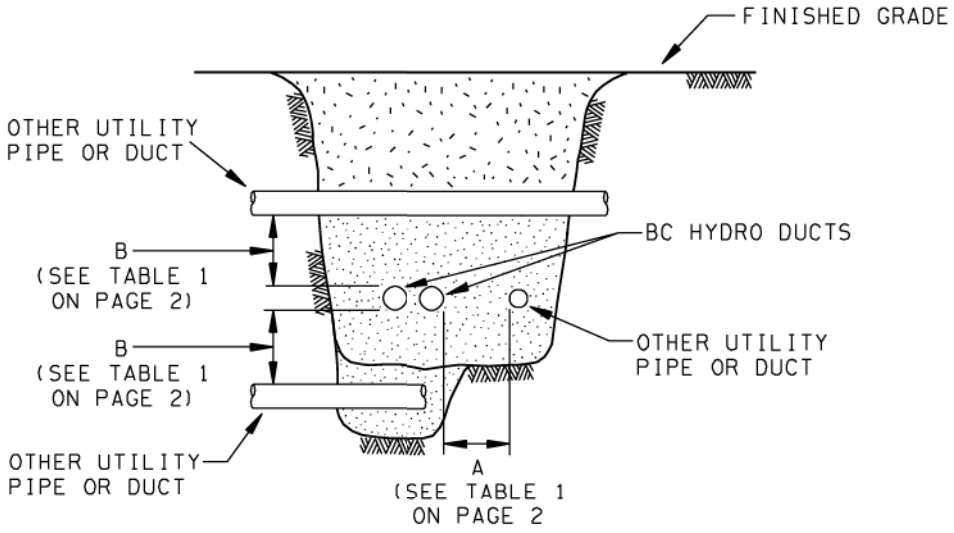
REFERENCE DRAWINGS

REVISED | R1-REDRAWN JULY '02 MF

DRAFTER	DESIGNER	APPROVED	DUCT WINDOW OPENINGS IN UNDERGROUND VAULTS, CHAMBERS AND MANHOLES
JW	M. FISCHER	F. KAEMPFFER	
ORIGINAL ISSUE DATE: JUNE 1980			



CONCRETE ENCASED DUCT
(GENERAL)



DIRECT BURIED DUCT
(GENERAL)

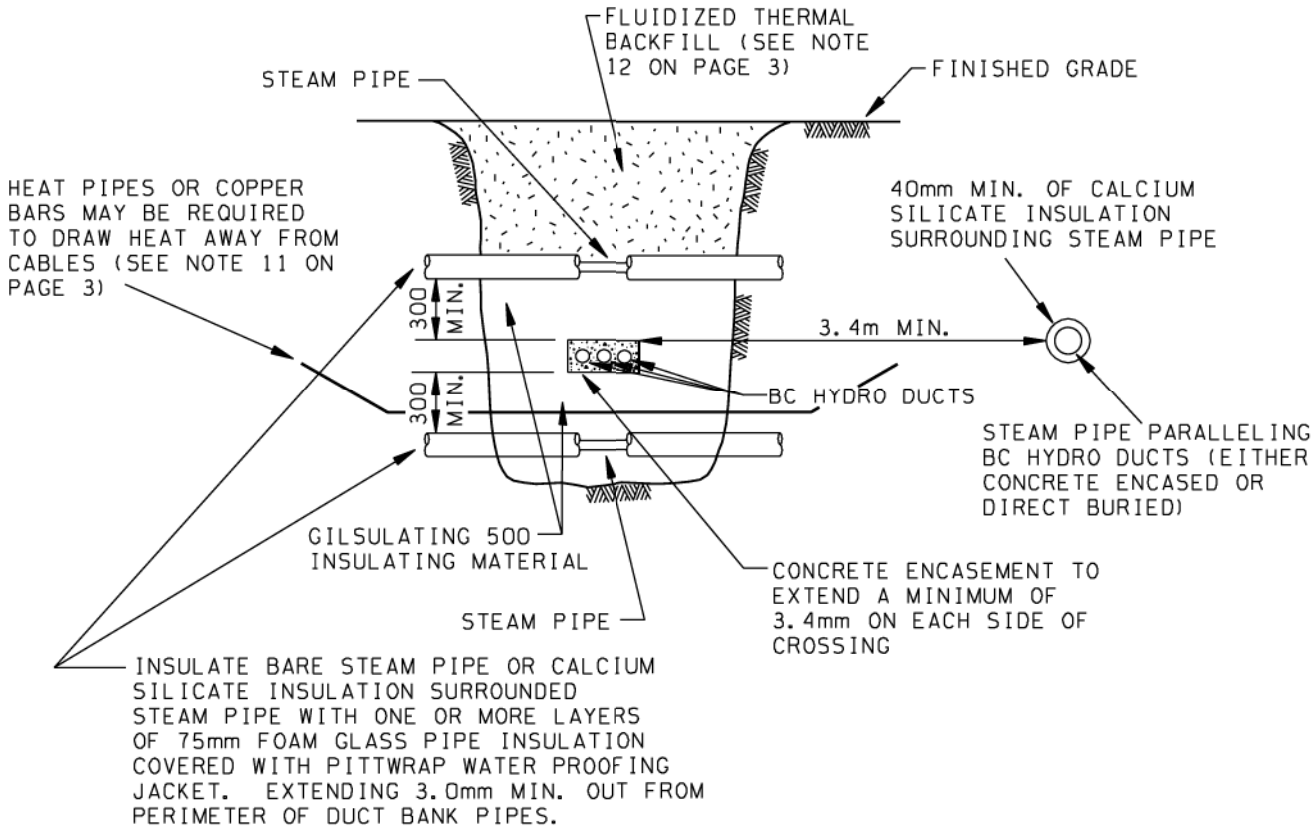
REFERENCE DRAWINGS

DRAFTER	DESIGNER	APPROVED
JW	M. FISCHER	F. KAEMPFFER

ORIGINAL ISSUE DATE: JUNE 1980

DUCT CLEARANCES TO OTHER UTILITIES

REVISED | R2-REDRAWN & REV. JULY '02 MF



BC HYDRO DUCT NEAR STEAM PIPES

(SEE NOTES 10, 11 AND 12 ON PAGE 3)

TABLE 1 - CLEARANCES

TYPE OF PIPE OR DUCT	DIRECT BURIED RECOMMENDED CLEARANCES		BC HYDRO CONCRETE ENCASED RECOMMENDED CLEARANCES (SEE NOTE 1 ON PAGE 3)	
	A	B	A	B
Telephone, Cablevision or Street Lights	300	150	75	150
Gas Mains	300	150	300	150
Water Oil Pipelines Oil, Jet Fuel Lines Storm and Sanitary Sewers	900	300	300	300

DRAFTER	DESIGNER	APPROVED	DUCT CLEARANCES TO OTHER UTILITIES
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NOTES:

1. The absolute minimum clearances may be used only when approved by BC Hydro designer.
2. For services on private property, see ES54 S1/S2.
3. TELUS and/or cablevision duct may occupy same concrete encasement when 4mm poly divider is installed between BC Hydro and communication ducts.
4. For general trenching details, see Drawings ES54 H1-01 and ES54 H1-02 for URD and UD installations and feeder installation, respectively.
5. At railway crossings, if the width of the duct bank exceeds 550mm, additional strengthening may be required as defined in CSA Standard C22.3 No. 7, Underground Systems.
6. At railway crossings, the minimum concrete cover over ducts shall be 75mm and the minimum concrete strength shall be 20 MPa at 28 days.
7. The depth of the duct bank below the bottom of the rail may be reduced if an impenetrable surface is encountered provided the railway allows the reduction. The minimum cover over BC Hydro ducts under railroads must not be less than 0.9m.
8. If insufficient installation depth is encountered, the vertical clearance between the concrete encasement and TELUS or cablevision ducts may be reduced to 80mm.
9. Horizontal clearances must be maintained regardless of vertical clearances. Horizontal clearances of other utility pipe or ducts to BC Hydro structures, such as service boxes, pull boxes, transformer pads and manholes shall be 150mm minimum.
10. The clearances shown are for steam pipes less than 225mm nominal diameter. For larger diameter pipes consult BC Hydro designer.
11. Heat Pipes or copper bars can be installed between the steam pipe and BC Hydro duct when the soil temperature exceeds the allowable conductor temperature of the cables. A specialized consultant such as Geotherm Inc. Newmarket, Ont. or other can custom design such heat sinks.
12. Fluidized thermal backfill shall have a thermal resistivity of 35° C cm/Watt or less in the moist condition and 100° C cm/Watt or less in the dry conditon.

REFERENCE DOCUMENT

CSA Standard C22.3 No. 7 "Underground Systems"

ES54 H1-02 General trenching details - Feeders
ES54 H1-02 General trenching details - URD and UD
REFERENCE DRAWINGS

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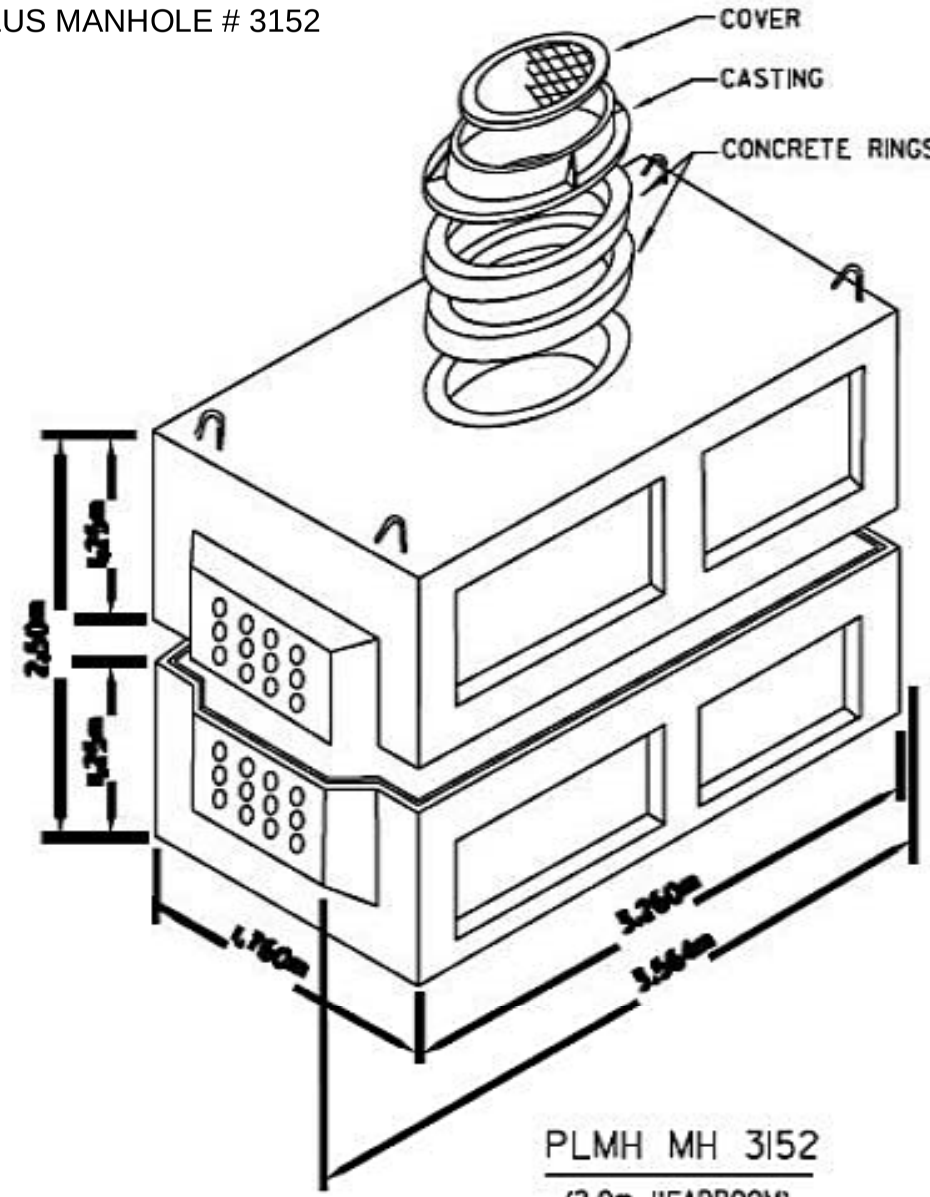
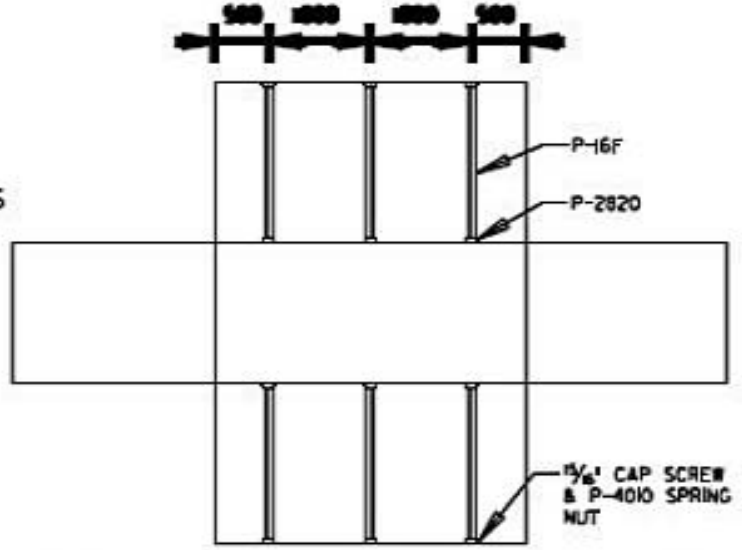
TELUS MANHOLE # 3152

AD 50



PLMH MH 3152

(2.0m HEADROOM)



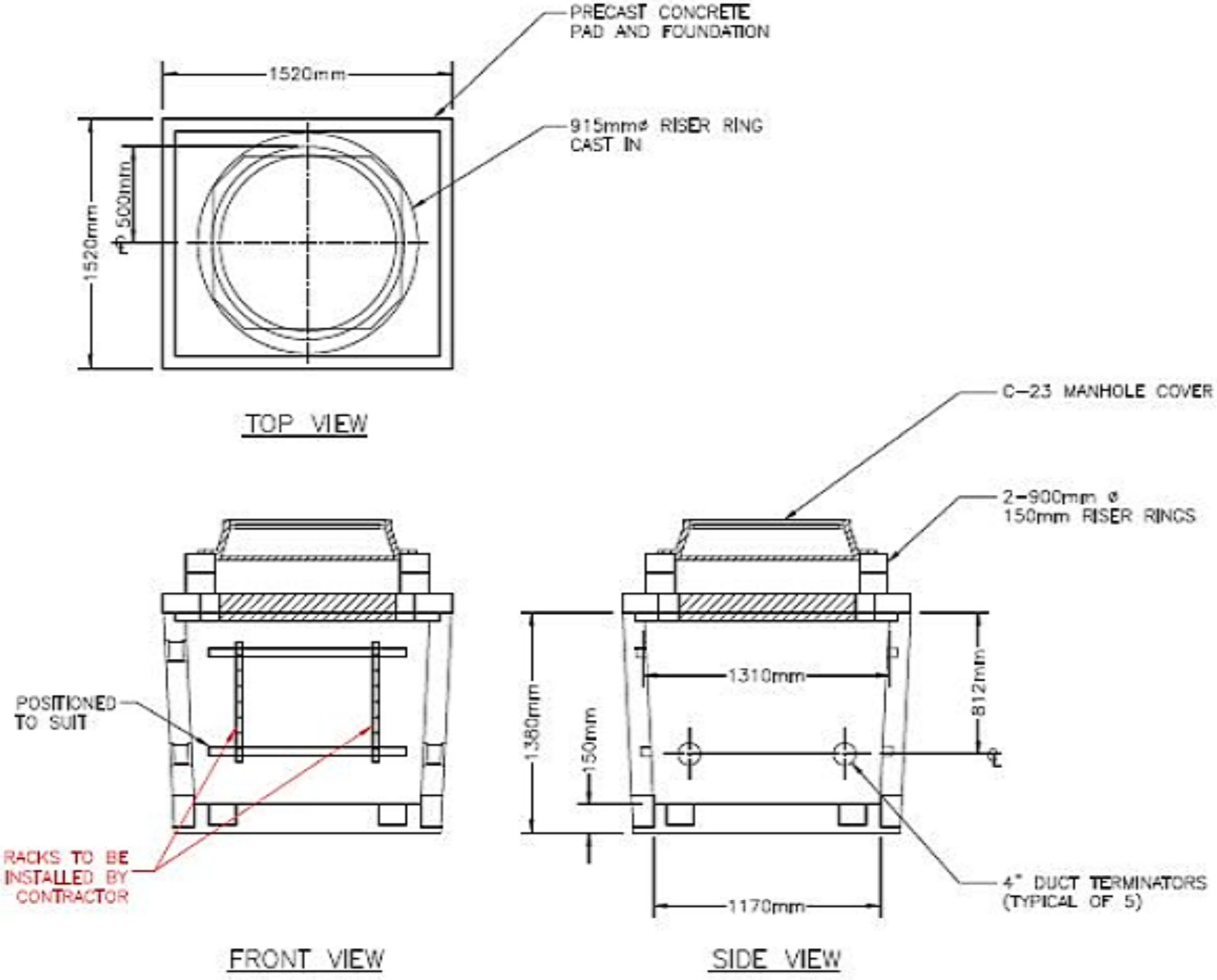
PLMH 3152 DESCRIPTION	MATERIAL HARDWARE DETAIL PART #	QUANTITY	ITEM	2.0m HEADROOM SIZE
VERTICAL TUBING	P-16F	8	EA	1930
VERTICAL TUBING	P-16F		EA	2745
BASE & CEILING SUPPORT	P-2820	12	EA	
SPRING NUT	P-4010	28	EA	1/2"
CAP SCREW		24	EA	1/2" x 1 5/8"
CAP SCREW		4	EA	1/2" x 2 3/4"
ANGLE BRACKET	P-1538B		EA	
FLAT PLATE WASHER				

INSTALLATION NOTES:

1. MANHOLE TO BE SET ON 150mm OF -20mm MULCH OR 150mm OF DRAIN ROCK IN WET CONDITIONS.
2. MANHOLE TO BE SET WITH 450mm MIN COVER.
3. PLACE GROUT BETWEEN MANHOLE TOP & BOTTOM SECTIONS BEFORE JOINING.
4. PAINT INSIDE WALLS & CEILING USING ONE COAT E.M.CRETE OR WHITE ACRYLIC LATEX.
5. WEIGHT: BASE 5250kg. TOP 5150kg
6. ALL DIMENSIONS ARE EXPRESSED IN MILLIMETERS UNLESS OTHERWISE NOTED.
7. INSTALL UNISTRUT RACKING. SEE DETAIL.

MH3152

AD 51



SHAW 1.5M SERVICE VAULT W/ROUND LID

SCALE: N.T.S.