



City of Coquitlam

Contract Documents 87422

Foster Pump Station Upgrades



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Invitation to Tenderers



INVITATION TO TENDER

DATE OF ISSUE: **April 28, 2023**

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

Tender No. 87422

Foster Pump Station Upgrades

The City of Coquitlam invites tenders for **Contract 87422 – Foster Pump Station Upgrades**, generally consisting of the following, but not limited to:

- Removal of existing vertical turbine pumps and replacement with 3 x 125 hp duty pumps
- Two new inline centrifugal jockey booster pumps and associated piping
- New flow meters, butterfly and other valves
- Removal of existing generator set, fuel tank, and provision of new exterior generator set in enclosure
- Reconfiguration of the existing piping to accommodate the new pump(s)
- Electrical and Instrumentation
- Civil, Architectural, Structural and Landscaping improvements
- Testing and Commissioning
- Other incidental and miscellaneous works

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, May 24, 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 87422

Foster Pump Station Upgrades

INSTRUCTIONS TO TENDERERS

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INSTRUCTIONS TO TENDERERS

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

The City of Coquitlam

Contract: **Foster Pump Station Upgrades**

Reference No. **87422**

- | | | |
|------------|-------------------------|--|
| 1.0 | Introduction | <p>1.1 These Instructions apply to and govern the preparation of tenders for this <i>Contract</i>. The <i>Contract</i> is generally for the following works:</p> <ul style="list-style-type: none">• Removal of existing vertical turbine pumps and replacement with 3 x 125 hp duty pumps• Two new inline centrifugal jockey booster pumps and associated piping• New flow meters, butterfly and other valves• Removal of existing generator set, fuel tank, and provision of new exterior generator set in enclosure• Reconfiguration of the existing piping to accommodate the new pump(s)• Electrical and Instrumentation• Civil, Architectural, Structural and Landscaping improvements• Testing and Commissioning• Other incidental and miscellaneous works <p>1.2 All inquiries regarding this Tender are to be submitted in writing referencing the Tender Name and Number sent to:</p> <p>E-mail bid@coquitlam.ca</p> <p>All inquiries will be received a minimum of 3 full business days prior to Tender Closing Time.</p> <p>Inquiries received after that time may not receive a response.</p> |
| 2.0 | Tender Documents | <p>2.1 The Tender Documents which a Tenderer should review to prepare a Tender consist of all of the <i>Contract Documents</i> 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 <i>Contract Documents</i> include the drawings listed in Schedule 2 to the Agreement, entitled "List of Contract Drawings".</p> <p>2.2 <u>A portion of the Contract Documents are included by reference. Copies of these documents have not been included with the tender package.</u> 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</p> |

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:* May 24, 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

4.1 Non-Mandatory Site Meeting

A site meeting has been arranged as per following:

Location: Foster Pump Station - 630 Poirier Street, Coquitlam.
(For location map, please refer to title page of the Tender Drawings)

Date/Time: Thursday, May 11, 2023 at 10am

Tenderers are strongly encouraged to attend the Meeting as scheduled above.

**Obtaining
Documents**

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

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

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

- 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	4.3	Prior to the excavation of test holes on road allowances or privately owned property the Tenderer shall obtain permission from the Municipality or Owner of the property and comply with their requirements for restoration of disturbed surfaces and utilities. Failure to comply with Municipal by-laws restricting this practice may result in prosecution of the offending party.
Business License	4.4	The successful Tenderer shall provide evidence of a City of Coquitlam Business License or Tri-Cities Inter-Municipal Business License prior to commencement of work or supply of materials. For more information, contact Business License Division Ph: 604-927-3085 or apply online at website: City of Coquitlam Business License
No Claim	4.5	Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderer shall have any claim for any compensation of any kind whatsoever, as a result of participating in this Tender, including accepting a non-compliant bid and by submitting a Tender, each Tenderer shall be deemed to have agreed that it has no claim.
No Cost	4.6	The City will not under any circumstances be responsible for any costs incurred by the Tenderer in preparing the Tender.
Right to Accept or Reject any Tender	4.7	<p>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.</p> <p>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.</p>
Negotiation	4.8	The City, prior to award of any Tender, may negotiate with the Tenderer presenting the lowest price compliant Tender, for changes in the Work, materials, specifications or conditions without having any duty or obligation to advise any other Tenderers or to allow them to modify their Tenders, and the City will have no liability to any Tenderer as a result of such negotiations or modifications.
Cancellation of Tender	4.9	The City reserves the right to cancel any request for Tender at any time without recourse by the Tenderer. The City has the right to not award this work for any reason including choosing to complete the work with the City's own forces.
Conflict of Interest	4.10	Tenderers shall disclose any actual or potential conflicts of interest and existing business relationships it may have with the City, their elected or appointed officials or employees.
Collusion	4.11	Tenderers will not discuss or communicate with one another in regards to the preparation of their Tenders. Each Tenderer will ensure that its participation in the Tender process and that of its team members is conducted without collusion or fraud. Failure to comply with this requirement may lead to disqualification without further notice or warning.

**Instruction to
Tenderers –
Part II**

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

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 accept 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:

(TENDERED 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 irrevocable as set out in paragraph 5.1 of the Form of Tender.

14.0 Qualifications of Tenderers

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

15.0 Award

15.1 In exercising its discretion, the *Owner* will have regard to the information provided in the Appendices to the Form of Tender as described under 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 be applied to determine whether the tender shall be rejected as incomplete:
 - (i) the highest of the unit prices tendered by other tenderers for that tender item shall be used as the test unit price, and the corresponding test extended total shall be calculated from the test unit price and the estimated quantity;

- (ii) if the test extended total for the tender item exceeds 1% of the revised total *Tender Price*, including the test extended total, or if the revised total *Tender Price*, including the test extended total, alters the ranking of the tenderers according to the lowest *Tender Price*, then the omitted unit price for that tender item is deemed to materially affect the *Tender Price* relative to other tenders and the tender shall be rejected;
- (iii) if the tender is not rejected under subparagraph (ii) of this IT 15.3 (c), then the unit price and the extended total for that tender item shall both be deemed to be, and the costs for that tender item shall be zero deemed to be included in other tender items prices;
- d) In no event shall page totals in the *Schedule of Quantities and Prices* or the total *Tender Price* be used to calculate missing extended totals or unit prices.

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 its 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. 87422

Foster Pump Station Upgrades

Summary

Name of **Contractor**: _____

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

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

**On or before 2:00 pm (local time)
Wednesday, May 24, 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
- 2. Add consolidated Tender file in PDF format, and Appendix 1 in XLS format, and Send** (ensure your web browser remains open until you receive 2 emails from Qfile to confirm upload is complete and was sent to the correct email address: bid@coquitlam.ca)

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

May 2023

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

(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: Foster Pump Station Upgrades

Reference No. 87422

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 **August 31, 2025**; 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

Contract 84722
Foster Pump Station Upgrades

SCHEDULE OF QUANTITIES AND PRICES

Refer to project supplementary specification section 01 20 00 "Price and Payment" for description of each line item
(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 discrepancy in the information provided, the City's original file copy shall prevail)

Item No.	Description of Work	Unit	Est. Qty.	Unit Price	Total Price
1	Division 1 – General				
1.01	Bonding and insurance	LS	1		
1.02	Mobilization and demobilization	LS	1		
1.03	Submittals	LS	1		
1.03	General Requirements	LS	1		
1.04	Commissioning	LS	1		
2	Division 2 – Demolition				
2.01	Demolition, general	LS	1		
2.02	Concrete cutting, coring and selective demolition	LS	1		
3	Division 3 – Concrete				
3.01	Cast-in-place concrete	LS	1		
3.02	Generator Set Concrete pad	LS	1		
3.03	Pre-cast Concrete Flow Meter Chamber	LS	1		
5	Division 5 – Metals				
5.01	Miscellaneous metal fabrications	LS	1		
5.02	Grating	LS	1		
5.03	Exterior Stairs	LS	1		
7	Division 7 - Finishes				
7.01	Framing / Finishing	LS	1		
7.02	Ceiling Insulation	LS	1		
8	Division 8 – Openings				
8.01	Metal doors, windows, frames and hardware	LS	1		
8.02	Access hatches and frames	LS	1		
9	Division 9 - Finishes				
9.01	Structural painting	LS	1		
9.01	Architectural painting	LS	1		
22	Division 22 – Plumbing				
22.01	Plumbing	LS	1		
23	Division 23 – Heating, Ventilating and Air Conditioning				
23.01	Ventilation	LS	1		
23.02	Split-system Ductless AC/Heat Pump Package	LS	1		
26	Division 26 – Electrical				
26.01	Electrical General	LS	1		

Item No.	Description of Work	Unit	Est. Qty.	Unit Price	Total Price
26.02	Electrical demolition	LS	1		
26.03	Control and VFD Cabinets	LS	1		
26.04	Electrical Kiosk	LS	1		
26.05	Diesel Generating Set	LS	1		
26.06	Electrical distribution equipment (LV)	LS	1		
26.07	Lighting systems	LS	1		
26.08	Heating and Ventilation	LS	1		
26.09	Conduit systems	LS	1		
26.10	Cable tray systems	LS	1		
26.11	Cabling, wiring and related work	LS	1		
26.12	Grounding system	LS	1		
31	Division 31 – Earthwork				
31.01	General earthworks	LS	1		
32	Division 32 – Site Improvements				
32.01	Re-grading / Surfacing / Site Restoration	LS	1		
32.02	Chain link fences and gates	LS	1		
32.03	Retaining Wall	LS	1		
40	Division 40 – Process Integration				
40.01	Supply and installation of process piping	LS	1		
40.02	Supply and installation of process valves	LS	1		
40.03	Process measurement devices	LS	1		
40.04	Control Valves	LS	1		
40.05	Mechanical demolition	LS	1		
43	Division 43 - Process Gas and Liquid Handling, Purification, and Storage Equipment				
43.01	Vertical turbine pumps	LS	1		
43.02	Vertical Inline Jockey pumps	LS	1		
43.03	Vertical Inline Jockey pumps	LS	1		

TOTAL

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

Name of **Contractor**: _____

APPENDIX 2

FORM OF TENDER

**Contract 87422
Foster Pump Station Upgrades**

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

INDICATE SCHEDULE WITH BAR CHART WITH CONSTRUCTION DURATIONS

CONSTRUCTION ACTIVITY	2023			2024				2025		
	APR to JUL	AUG to OCT	NOV to DEC	JAN to MAR	APR to JUL	AUG to OCT	NOV to DEC	JAN to MAR	APR to JUL	AUG to OCT

Substantial Completion Date: **August 31, 2025**

NOTE: Foster Pump Station is to be fully operable from May 1 to September 30 during peak summer water demands.

Proposed Disposal Site: _____

APPENDIX 3

FORM OF TENDER

**Contract 87422
Foster Pump Station Upgrades**

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

Proposed Project Superintendent _____

List of Project Experience

PROJECT:		Dates:	
Work Description:			
Responsibility:			
Owner/Reference:		Phone NO:	

PROJECT:		Dates:	
Work Description:			
Responsibility:			
Owner/Reference:		Phone NO:	

PROJECT:		Dates:	
Work Description:			
Responsibility:			
Owner/Reference:		Phone NO:	

APPENDIX 4

FORM OF TENDER

**Contract 87422
Foster Pump Station Upgrades**

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 87422
Foster Pump Station Upgrades**

SUBCONTRACTORS

(See paragraph 5.3.5 of the Instructions to Tenderers)

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

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

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

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

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

APPENDIX 6

FORM OF TENDER

**Contract 87422
Foster Pump Station Upgrades**

Bid Bond

NO. _____

\$ _____

KNOW ALL MEN BY THESE PRESENTS THAT

As Principal, hereinafter called the Principal, and

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

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

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

WHEREAS, the Principal has submitted a written Tender to the Obligee, dated the _____ day of
_____, 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 87422
Foster Pump Station Upgrades**

CERTIFICATE OF COMPLIANCE for CONTRACT INSURANCE

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

Contract Number: **87422**

Contract Name: **Foster Pump Station Upgrades**

Description of Work:

- Removal of existing vertical turbine pumps and replacement with 3 x 125 hp duty pumps
- Two new inline centrifugal jockey booster pumps and associated piping
- New flow meters, butterfly and other valves
- Removal of existing generator set, fuel tank, and provision of new exterior generator set in enclosure
- Reconfiguration of the existing piping to accommodate the new pump(s)
- Electrical and Instrumentation
- Civil, Architectural, Structural and Landscaping improvements
- Testing and Commissioning
- Other incidental and miscellaneous works

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

Special Coverage Required:	<u>YES</u>	<u>NO</u>	<u>Special Coverage Description</u>
	()	(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: Foster Pump Station Upgrades

Reference No. 87422

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 **August 31, 2025**, 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 *Contractor*:

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)

Foster Pump Station Upgrades

Reference No: 87422

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

Foster Pump Station Upgrades

Reference No: 87422

Schedule 2

LIST OF DRAWINGS

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

Bound in this Document:

Appendix A - Traffic Management Detail Specifications

Appendix B – As-Built Record Drawings

Appendix C – Arborist Report

Appendix D – Geotechnical Report

Bound Separately:

Appendix E – Supplementary Specifications (Project)

Full Size Contract Drawings

TITLE	SHEET NO.	REVISION NO.	DATE
COVER SHEET & KEY PLAN	-	-	-
GENERAL – DRAWING INDEX	G102	0	13 APR 2023
CIVIL – EXISTING SITE PLAN	C101	1	13 APR 2023
CIVIL – SITE PLAN	C102	1	26 APR 2023
CIVIL – RETAINING WALL SITE PLAN	C111	A	-
CIVIL – RETAINING WALL ELEVATION VIEW, TYPICAL DETAIL AND NOTES	C112	0	14 APR 2023
STRUCTURAL – STRUCTURAL NOTES	S101	0	MAR 10 2023
STRUCTURAL – DEMOLITION PLAN, SECTION & DETAIL	S105	0	MAR 10 2023
STRUCTURAL – ARRANGEMENT PLAN	S111	0	MAR 10 2023
STRUCTURAL – ARRANGEMENT SECTIONS	S112	0	MAR 10 2023
STRUCTURAL – MISC. CONCRETE – PLANS & SECTIONS	S121	0	MAR 10 2023
STRUCTURAL – GENSET PAD – DETAILS	S131	0	MAR 10 2023
STRUCTURAL – KIOSK PAD & STAIR LANDING – DETAILS	S133	0	MAR 10 2023
STRUCTURAL – PARTITION WALL – PLAN, SECTION & DETAIL	S151	0	MAR 10 2023
STRUCTURAL – GRATING – PLAN, SECTION AND DETAILS	S161	0	MAR 10 2023
STRUCTURAL – STRUCT. STEEL – PLANS AND SECTION	S171	0	MAR 10 2023
STRUCTURAL – STRUCT. STEEL – SECTIONS	S173	0	MAR 10 2023
STRUCTURAL – STRUCT. STEEL – SECTIONS AND DETAILS	S175	0	MAR 10 2023
STRUCTURAL – STRUCT. STEEL – SECTIONS AND DETAILS	S176	0	MAR 10 2023
MECHANICAL – EXISTING PROCESS PIPING PLAN	M100	1	26 APR 2023
MECHANICAL – DEMOLITION PLAN	M101	1	26 APR 2023
MECHANICAL – PROCESS PIPING PLAN	M102	0	05 APR 2023
MECHANICAL – PROCESS PIPING SECTIONS	M103	0	05 APR 2023

TITLE	SHEET NO.	REVISION NO.	DATE
MECHANICAL – PROCESS PIPING PLAN AND SECTIONS – JOCKEY PUMP	M104	0	05 APR 2023
MECHANICAL – PROCESS PIPING DETAILS	M105	0	05 APR 2023
MECHANICAL – PROCESS PIPING DETAILS	M106	0	05 APR 2023
MECHANICAL – ZONE 3A DISCHARGE MAIN MODIFICATIONS	M107	0	05 APR 2023
MECHANICAL – PIPE SUPPORT DETAILS	M108	0	05 APR 2023
MECHANICAL – HVAC OVERVIEW PLAN / SECTIONS	M120	1	26 APR 2023
MECHANICAL – HVAC DETAILS	M121	0	05 APR 2023
MECHANICAL – FLOW METER CHAMBER PLAN, SECTIONS, BILL OF MATERIALS	M300	0	29 MAR 2023
MECHANICAL – FLOW METER CHAMBER DETAILS	M301	0	29 MAR 2023
PROCESS & INSTRUMENTATION – P&ID SYMBOL LEGEND	P001	0	05 APR 2023
PROCESS & INSTRUMENTATION – WATER SYSTEM SCHEMATIC	P002	0	05 APR 2023
PROCESS & INSTRUMENTATION – EXISTING PROCESS AND INSTRUMENTATION DIAGRAM	P100	1	26 APR 2023
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ELECTRICAL – VFD-450 WIRING DIAGRAM	E604	-	31-03-2023
ELECTRICAL – VFD-460 WIRING DIAGRAM	E605	-	31-03-2023
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Supplementary General Conditions

SUPPLEMENTARY GENERAL CONDITIONS

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1.0 DEFINITIONS

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

2.0 DOCUMENTS

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

4.0 CONTRACTOR

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

- 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 Contractor 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	<i>(Add new clause 4.6.8 as follows):</i> 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	<i>(Add new clause 4.7.4 as follows):</i> 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	<i>(Add new clause 4.8.2 as follows):</i> 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	<i>(Add new clause 4.9.3 as follows):</i> The Contractor shall, at their cost, <ul style="list-style-type: none">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	<i>(Replace clause 4.11.3 as follows):</i> 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 as 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 wish 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	<p><i>(Add new clause 7.4.2 as follows):</i></p> <p>If there are Optional items or Provisional items included in the <i>Schedule of Quantities and Prices</i>, 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.</p>
9.0	VALUATION OF CHANGES AND EXTRA WORK		
9.2	Valuation Method	9.2.4	<p><i>(Replace clause 9.2.4 as follows):</i></p> <p>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.</p>
9.4	Quantity Variation	9.4.1	<p><i>(Replace clause 9.4.1 as follows):</i></p> <p>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 <i>Schedule of Quantities and Prices</i> (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.</p>
		9.4.2	<p><i>(Delete clause 9.4.2 (2))</i></p>
10.0	FORCE ACCOUNTS		
10.1	Force Account Costs	10.1.1(1)	<p><i>(Add to clause 10.1.1(1) as follows):</i></p> <p>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.</p>
		10.1.1(4)	<p><i>(Replace clause 10.1.1(4) as follows):</i></p> <p>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.</p>

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.

	Liquidated Damages for Construction Impacts on Foster Pump Station Operation	13.9.2	<p><i>(Add new clause 13.9.2 as follows):</i></p> <p>Pump Station will be allowed to be shut down by the Contractor for construction from October 1st to 31st March. Contractor shall allow for start-up activities, testing, programming and commissioning during the month of April. The Pump Station shall be brought back to service not later than May 1st, as described in Project Supplementary Specifications <i>Section 01 12 16 Works Sequence</i>. For any delay beyond this date, the contractor will be required to pay a penalty of \$10,000 for each day or part of a day the Pump Station could not be put back in service.</p>
18.0	PAYMENT		
18.1	Preparation of Payment Certificate	18.1.1	<p><i>(Replace clause 18.1.1 as follows):</i></p> <p>The Contract Administrator shall prepare and issue a certificate for the period ending the last calendar day of the month.</p>
18.4	Holdbacks	18.4.2	<p><i>(Add to clause 18.4.2 as follows):</i></p> <p>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.</p>
18.6	Substantial Performance	18.6.5	<p><i>(Replace clause 18.6.5 as follows):</i></p> <p>The Owner may release any builders lien holdback on the <u>56th day</u> 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.</p>
		18.6.6	<p><i>(Replace clause 18.6.6 as follows):</i></p> <p>The <i>Contract Administrator</i>, as defined herein, shall be the <i>Payment Certifier</i> responsible under Section 7 of the <i>Builders Lien Act</i> for certifying <i>Substantial Performance</i> of the <i>Work</i> of the <i>Contractor</i>, but not the <i>Work</i> of <i>Subcontractors</i>. The <i>Contractor</i> shall cooperate with and assist the <i>Contract Administrator</i> by providing information and assistance in a timely manner as the <i>Contract Administrator</i> considers necessary to carry out the duties of the <i>Payment Certifier</i> for the <i>Contract</i>.</p> <p>The <i>Contractor</i> shall be the <i>Payment Certifier</i> responsible under Section 7 of the <i>Builders Lien Act</i> for certifying <i>Substantial Performance</i> of the <i>Work</i> of each <i>Subcontractor</i>. Prior to certifying completion for a <i>Subcontractor</i>, the <i>Contractor</i> shall consult the <i>Contract Administrator</i> and obtain the <i>Contract Administrator's</i> comments on the status of completion by the <i>Subcontractor</i>, including any deficiencies or defects in the <i>Subcontractor's Work</i> noted by the <i>Contract Administrator</i>. The <i>Contractor</i> will indemnify and save the <i>Owner</i> harmless from any and all liability the <i>Owner</i> may have to anyone arising out of the certification by the <i>Contractor</i> of <i>Substantial Performance</i> for that <i>Subcontractor</i>.</p>

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

These Supplementary General Conditions must be read in conjunction with the General Conditions contained in the Master Municipal Construction Documents, Volume II, Printed 2009

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

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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 Oblige 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 Oblige 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 Oblige or by joining the Oblige 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 Oblige against all costs, charges and expense or liabilities incurred thereon and any loss or damage resulting to the Oblige 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 Oblige 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 Oblige, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal, Surety and Oblige 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

)
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)
)

PRINCIPAL

SURETY

These Supplementary General Conditions must be read in conjunction with the General Conditions contained in the Master Municipal Construction Documents, Volume II, Printed 2009

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: Liability Limit:
Policy Number: Expiry Date:
Effective 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

These Supplementary General Conditions must be read in conjunction with the General Conditions contained in the Master Municipal Construction Documents, Volume II, Printed 2009



APPENDIX IV

PRIME CONTRACTOR DESIGNATION

Subject: **Prime Contractor Designation**
Contract #: **87422**
Contract Name: **Foster Pump Station Upgrades** (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

to the
MASTER MUNICIPAL SPECIFICATIONS
Volume II – Platinum Book

Foster Pump Station Upgrades
CONTRACT 87422

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

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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.

1.02 Survey Layout

Construction layout will be the responsibility of the Contractor as outlined in Supplementary General Condition 4.1.1.

1.03 Coordination of Work

The Contractor shall be responsible to consult with all affected businesses, residents, transportation companies regarding delays, detours, and any other works affecting any transit service in the area, and will be responsible to coordinate the works with City crews and other contractors working in the area. If working area is to become a multiple-employer workplace as defined by WorkSafe BC, the Contractor shall remain the Prime Contractor.

1.04 Cooperation with Emergency and Maintenance Activities

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

- Fire, Police, and Ambulance
- Progressive Waste Solutions (garbage/recycling pick-up)
- City Utilities Maintenance (or representatives)

1.05 Manholes & Valves

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

1.06 Outside Agency Approval

In accordance with the Contract Documents, the Contractor is responsible to consult with and obtain any approval required to meet and comply will all of the conditions required from outside agencies such as, but not limited to, BC One Call, Metro Vancouver, BC Hydro, Telus, Kinder Morgan, and FortisBC in the Place of Work.

1.07 Lane Closure Restrictions

Refer to: Appendix A: Traffic Management Detail Specifications.

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

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

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

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

1.08 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.

1.09 Location of Existing Utilities

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

Pre-locates must be completed as soon as possible after award of the contract so changes can be completed by the Engineer prior to site construction. Contact 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.

1.10 List of 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. 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 report. 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

Refer to SGC 4.1.1.

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 m³

2. Granular Base

2.1 Compaction: 1 test / 500m² / 100mm depth of granular base

2.2 Sieve: 1 test / placed material / 250 TONNES

3. Granular Subbase

3.1 Compaction: 1 test/500m² / 300mm depth of granular subbase

3.2 Sieve: 1 test / placed material / 250 TONNES

4. Embankment (Subgrade)

4.1 Compaction: 1 test/ 50m² / 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 m²/lift

5.4 Continuous asphalt density testing during paving.

6. Subgrade Preparation

6.1 Compaction & Moisture: 1 test / 500 m²

7. Concrete Tests

7.1 Air, Slump & 1 Set Cylinders: 1 test / 10 m³, min. 1 set / day

1.7 Measurement and Payment

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

END OF SECTION

1.0	GENERAL	Add 1.0.6	<p>The <i>Contractor</i> is responsible for all temporary traffic control on the streets required for completion of the work. The <i>Contractor</i> will be responsible to provide a Traffic Management Plan (TMP) for approval (5) five working days prior to any lane closures taking place.</p> <p>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.</p> <p>The Contractor shall ensure safe passage of vehicles, cyclists and pedestrian through the work zone.</p>
		Add 1.0.7	<p>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.</p>
		Add 1.08	<p>Refer to Appendix A – Traffic Management Detail Specifications.</p>
1.4	Traffic Control	Delete 1.4.1 and replace with the following	<p>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.</p> <p>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.</p> <p>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.</p>
		Add 1.4.9.3.1	<p>The <i>Contractor</i>, as required by the <i>Contract Administrator</i> and the City, is to supply Construction Zone information signs (stationary), refer to MMCD 01 58 01 for the required identification signage.</p> <p>The <i>Contractor</i> is responsible for the removal of the signs at the completion of the work.</p>
		Delete 1.4.10.1.3 and replace with the following	<p>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.</p>

1.5

**Measurement and
Payment**

Delete 1.5.1 and
replace with the
following

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

END OF SECTION

1.0 GENERAL

1.0.3 Erosion and
Sediment Control
Supervisor

Add 1.0.3

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.

1.2 Temporary Erosion
and Sediment
Controls

Delete 1.2.1.1 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*.

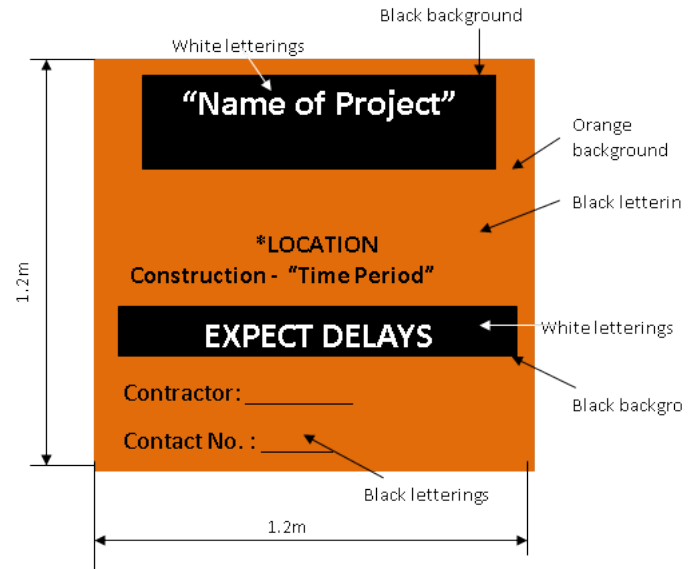
		Add 1.4.3.8	Ensure that any fuel stored on-site is located at least 15 metres from the nearest stream, and is placed within a bermed and lined area, in order to prevent leaks or spills into the environment.
		Add 1.4.3.9	All equipment and machinery must be in good working condition (power washed), free of leaks or excess oil and grease. No equipment refueling or servicing shall be undertaken within a minimum of 15 metres of any watercourse or surface water drainage.
1.6	Measurement and Payment	Delete 1.6.1 and replace with the following	Erosion and Sediment Control (ESC) will include 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. Works performed under this section will be incidental to payment for work described in other Sections.
		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 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 <i>Contract Administrator</i> 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 as described in Appendix A – Traffic Management Detail Specifications includes supply, placement & removal. Unless identified in the Schedule of Quantities, payment will be incidental to work described in other Sections.



Add 1.3.2

Payment for changeable message signs (CMS) includes supply, placement, communication management & removal as required for traffic & pedestrian safety.

Payment for changeable message signs used for only a fraction of a month will be paid *prorata*.

END OF SECTION

1.0 GENERAL

1.4 Measurement and Payment Delete 1.4. and replace with the following All concrete work performed under this section will be treated as incidental to the work performed under other sections.

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

3.9 Expansion Joints Delete 3.9.1 and replace with the following

Form transverse expansion joints at both ends of curb returns and at maximum spacing of 9.0 m for sidewalks, 30.0 m of curb and gutter, at each end of driveway crossing, at tangent point of circular work, and on either side of catch basins.

END OF SECTION

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**

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

END OF SECTION

SHRUB AND TREE PRESERVATION

1.3	Measurement and Payment	Delete 1.3.1 and replace with the following	Payment for all work performed under this section will be incidental to payment for the 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 <i>Contractor</i> is responsible to not cause unnecessary damage to all trees which are to remain.
		Add 3.1.8	The <i>Contractor</i> 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 <i>Contract Administrator</i> and the City for tree damage where proper notification was not received from the <i>Contractor</i> . 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 <i>Work</i> .
		Add 3.1.9	Place protective fencing/barricades as detailed on Coquitlam Standard Detail Drawings COQ-R26 where shown on the Contract Drawings. <i>Contractor</i> shall maintain fence in good condition during construction.
		Add 3.1.10	When work is to be performed inside fenced areas, <i>Contractor</i> shall take care to avoid damage to existing vegetation. Work to be done inside areas of existing vegetation to be retained includes: <ul style="list-style-type: none"> .1 Removal of isolated trees as directed by the <i>Contract Administrator</i> 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 <i>Contract Administrator</i> and the City.

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.

1.10 Measurement and Payment

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

Delete 1.10.3 and
replace with:

Payment for over excavation including supply, placement and compaction of 19mm clear crushed backfill will be made on a volumetric basis at the unit rate tendered, and only for the volume authorized by the Contract Administrator. Payment to include removal and disposal of the unsuitable excavated native material.

Add 1.10.9

Payment for imported trench backfill, 75mm minus pit run gravel (in accordance to Clause 2.3 Pit Run Gravel in Section 31 05 17 – Aggregates and Granular Materials), includes supply, transport, placement, adjustment of moisture content and compaction to 95% modified proctor density. Payment includes the offsite disposal of the unsuitable native material.

Payment for imported backfill will be made by measurement of volume confirmed by the tonne delivered to the Place of Work based on truck weigh slips. Weigh slips must be submitted to the Contract Administrator on a daily basis. Weigh slips which are not submitted daily will not be accepted for payment.

2.0 PRODUCTS

2.2 Use of Specified Materials

Delete 2.2.1.2

Delete Pit Run Sand.

Delete 2.2.3.3

Delete Pit Run Sand.

3.0 EXECUTION

3.3 Excavation

Delete 3.3.1.2 and
replace with the
following

Connections to existing waterworks systems are to be made by the *Contractor* under the inspection / supervision of the *Contract Administrator* and the City.

3.6 Surface Restoration

Delete 3.6.2.4 and
replace with the
following

Restore lawns with approved topsoil and sod to match existing lawn.

Delete 3.6.3.1 and
replace with the
following

Restore surface with a minimum 100 mm of 19 mm granular road base material.

Delete 3.6.7.5 and
replace with the
following

Restore Pavement as detailed on Coquitlam Standard Detail Drawing COQ-G4. Trench patch shall be a minimum 100 mm thickness noting that a key into existing asphalt is not required.

END OF SECTION

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

COLD MILLING

**1.5 Measurement and
Payment**

Delete Clause 1.5.
and Add:

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

END OF SECTION

GRANULAR SUBBASE

1.4	Measurement and Payment	Add to 1.4	Payment for all work performed under this section will be incidental to payment for the work described in other Sections.
		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, and shall be incidental to the unit price bid in other sections of the Schedule of Quantities and Prices.
2.0	PRODUCTS	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.
2.1	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

GRANULAR BASE

1.4	Measurement and Payment	Add to 1.4	Payment for all work performed under this section will be incidental to payment for the work described in other Sections.
		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, and shall be incidental to the unit price bid in other sections of the Schedule of Quantities and Prices.
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	<p>Prior to paving with asphalt concrete, the base surface shall be checked by the <i>Contract Administrator</i> 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.</p> <p>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."</p>

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 all work performed under this section will be incidental to payment for the work described in other Sections. |
| 1.6 | Inspection and Testing | Add 1.6.3 | Test cores will be taken by the <i>Contract Administrator</i> 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 <i>Contract Administrator</i> and the City may approve higher proportion of RAP if <i>Contractor</i> demonstrates ability to produce mix meeting requirements of the specification. |
| | | Delete 2.2.3.2 Marshall Stability and replace with the following | Marshall Stability at 60°C for both lower and upper courses to be 10 KN min. |

3.0 EXECUTION

- | | | | |
|------------|--------------------|---|---|
| 3.3 | Preparation | Delete 3.3.3 and replace with the following | <p>The <i>Contractor</i> 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 <i>Work</i> unless otherwise noted in the <i>Contract Documents</i>.</p> <p>The <i>Contractor</i> should note that certain utility owners may decide to complete their own adjustments. The <i>Contractor</i> will be required to cooperate with any utility company providing their own adjustments.</p> <p>The <i>Contractor</i> 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.</p> <p><u>All manholes must be vertically adjusted a minimum of twenty-four (24) hours prior to paving.</u> The use of riser rings for adjusting manhole frames and value boxes will not be permitted.</p> |
|------------|--------------------|---|---|

- | | | | |
|------------|---------------|---|--|
| 3.7 | Joints | Delete 3.7.5 and replace with the following | Construct butt joints at locations as shown on the <i>Contract Drawing</i> and as directed in the field by the <i>Contract Administrator</i> and the City. |
|------------|---------------|---|--|

END OF SECTION

UNIT PAVING

1.0 GENERAL

1.1 Related Work

Add 1.1.7

Geosynthetics

Section 31 32 19

1.3 Samples

Add 1.3.2

The *Contractor* shall install a 2m x 2m trial area for approval prior to full installation.

Add 1.3.3

The trial area shall be retained as the standard for the project. Surcharge of the bedding sand layer, joint sizes, line, laying pattern(s), color(s) and texture of the trial panel shall be consistent throughout the job.

Add 1.3.4

The trial area may form part of the permanent surface if approved by the *Contract Administrator* and the City. Any trial area that is not part of the final product shall be removed and properly disposed of at the contractor's expense.

1.6 Measurement and Payment

Delete 1.6 and replace with the following

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

1.7 Inspection and Testing

Add 1.7.2

Contractor shall provide an independent quality test to be completed during construction. Testing company shall be approved by the *Contract Administrator* and the City.

Add 1.7.3

Geotechnical assessment of subgrade is required in order to assess soil conditions and design the road structural section. Design report shall be submitted to the *Contract Administrator* and the City for approval prior to commencing work.

2.0 PRODUCTS

2.1 Materials

Delete 2.1.4 and replace with the following

Bedding sand shall conform to the following gradation limits:

Sieve Size (mm)	Percent Passing (%)
9.52	100
4.75	95 – 100
2.35	80 – 100
1.18	50 - 85
0.60	25 - 60
0.30	10 - 30
0.15	5 – 15
0.075	0 - 10

Add 2.1.7

Concrete pavers shall conform to ASTM C939 to C982, specifications for solid concrete interlocking paving units.

Add 2.1.8

Paver type, size and colour, shall be as indicated on the *Contract Drawing*. Paver thickness shall vary. All pavers used in driveways shall be a minimum 80 mm thick. All pavers used for boulevard or sidewalk areas shall be a minimum 60 mm thick.

Add 2.1.9

Pigmentation of concrete pavers shall be a solid colour throughout the unit.

Add 2.1.10

Normal weight aggregate shall be used for the concrete mix.

Add 2.1.11

Jointing sand shall consist of at least 30% of 1 mm sand particles and shall otherwise meet the requirements for bedding sand.

Add 2.1.12

All concrete pavers shall be sealed.

UNIT PAVING

3.0 EXECUTION

- | | | | |
|-----|----------------------------------|---|---|
| 3.2 | Granular Subbase and Base | Add 3.2.5 | Sand, when stock piled onsite, shall be protected against the rain. |
| 3.5 | Unit Paving | Delete 3.5 and replace with the following | <p>.1 Concrete pavers shall be delivered and stored on-site in metal strapping or shrink wrapped PVC.</p> <p>.2 Prior to installation of concrete pavers all street signs shall be installed.</p> <p>.3 Sand bedding shall have moisture content not less than 6% and not more than 8% prior to compaction.</p> <p>.4 Sand bedding shall be spread evenly over an area not greater than required to receive concrete pavers in one day and shall be protected against accidental pre-compaction and rain.</p> <p style="padding-left: 40px;">.1 This bedding shall have a minimum compacted thickness of 20 mm and a maximum compacted thickness of 40 mm, and shall be graded to meet crossfalls in boulevards, sidewalks and driveways.</p> <p>.5 Concrete pavers shall be laid in a pattern as indicated on the <i>Contract Drawing</i>.</p> <p style="padding-left: 40px;">.1 Joints between units shall not exceed 3 mm.</p> <p style="padding-left: 40px;">.2 Full units shall be installed first and edge pieces fitted subsequently.</p> <p>.6 Edge restraint shall be as indicated on the <i>Contract Drawing</i>.</p> <p>.7 Gaps at junctions between concrete pavers and edge restraints shall be filled with purpose made or cut edge pieces. Paver shall be cut to fit other conditions. All pavers shall be cut with an approved paver guillotine or masonry cut-off saw to neatly, and accurately fit without damaged edges.</p> <p>.8 Pavers shall be vibrated to their final level by having not less than 3 passes of a vibrating plate compactor. The compactor shall be a high frequency, low amplitude unit with plate size sufficient to cover a minimum 12 pavers.</p> <p>.9 After placement, jointing sand shall be spread over the paver surface and vibrated to completely fill all joints. Jointing sand shall be reinstalled after the first heavy rainstorm.</p> |
| 3.6 | Acceptance | Add 3.6.2 | All pavers must drain freely with no ponding of water. |
| | | Add 3.6.3 | Defective, chipped or poorly cut pavers shall be replaced. |
| | | Add 3.6.4 | Surfaces shall abut flush with adjacent materials. Surface of finished pavement shall be free from depressions exceeding 3 mm as measured with 3m straight edge. |

END OF SECTION

1.0 GENERAL

- | | | | |
|------------|--------------------------------|--|---|
| 1.2 | References | <p>Add 1.2.2 CAN/CGSB-138.1-M80, Fence, Chain Link Fabric</p> <p>Add 1.2.3 CAN/CGSB-138.2-M80, Fence, Chain Link, Framework, Zinc-Coated, Steel.</p> <p>Add 1.2.4 CAN/CGSB-138.3-M80, Fence, Chain Link Installation.</p> <p>Add 1.2.5 CAN/CGSB-138.4-M82, Fence, Chain Link, Gates.</p> <p>Add 1.2.6 CSA G164-M1981, Hot Dip Galvanizing of Irregularly Shaped Articles.</p> <p>Add 1.2.7 ASTM A90-81, Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.</p> <p>Add 1.2.8 ASTM A53-88a, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.</p> <p>Add 1.2.9 CGSB 1-GP-181M-77, Coating, Zinc-Rich, Organic, Ready Mixed.</p> | <p>Prior to the start of the work, submit a 300 mm long powder-coated pipe sample that will be representative of the quality of the powder-coating for all powder-coated fencing materials installed as part of the <i>Work</i>.</p> |
| 1.4 | Samples | <p>Delete 1.4.1 and replace with the following</p> | |
| 1.5 | Measurement and Payment | <p>Add 1.5.5</p> <p>Add 1.5.6</p> | <p>Payment for all work performed under this section will be incidental to payment for the work described in other Sections.</p> <p>Payment under this item will include supply and installation of W-Beam barrier on timber posts as shown on the contract drawings.</p> |
| 1.6 | Inspection and Testing | <p>Add 1.6.2</p> <p>Add 1.7.1</p> | <p>The surface of the posts and rails will be scratch tested to ensure the finish does not flake. Finishes that flake when scratched will be rejected.</p> <p>Execute work in this Section only by a <i>Contractor</i> who has adequate equipment, skilled tradesmen, and materials to perform the work expeditiously and to the contract specifications.</p> |
| 1.7 | Qualifications | <p>Delete 2.1.1 and replace with the following</p> | <p>Fencing, posts, rails, and fabric shall be constructed as shown on the <i>Contract Drawing</i> and Specifications herein.</p> |

2.0 PRODUCTS

- | | |
|--|---|
| <p>Delete 2.1.3 and replace with the following</p> | <p>Chain-link fence fabric: to CAN/CGSB-138.1.</p> <ol style="list-style-type: none"> 1. All chain link fabric shall be galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings. The widest rolls of fabric shall be employed in the construction of the appropriate fence type (i.e. 1200 mm wide rolls for 1200 mm high fencing and 2400 mm wide rolls for 2400 mm high fencing, etc.). 2. Fabric gauges, fabric opening sizes, fence heights, and post spacing shall be as follows: <ol style="list-style-type: none"> .1 For passive and low activity City and Park areas the chain link fence shall be: <ol style="list-style-type: none"> .1 1200 mm high with the post spacing 3000 mm o.c. and, .2 Chain link fabric shall be 9 gauge (3.55 mm diameter) galvanized, vinyl coated, black, commercial grade with 50 mm openings. .2 For high activity City and Park areas the chain link fence shall be: <ol style="list-style-type: none"> .1 1200 mm high with the post spacing 2400 mm o.c. and, .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings |
|--|---|

2.1 Materials

Delete 2.1.4 and
replace with the
following

- .3 For the baseball diamond backstop the chain link fence shall be:
 - .1 4600 mm and higher with the post spacing 2400 mm o.c and,
 - .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 38mm openings.
- .4 For the soccer playing field backstop fences the chain link fence shall be:
 - .1 6000 mm and higher with the post spacing 2400 mm o.c and,

Chain link fabric shall be 6 gauge (4.50 mm) 6 gauge galvanized, vinyl coated, black, commercial and heavy grade with 38 mm openings. Posts and rails for all fencing locations are to CAN/CGSB-138.2, schedule 40 galvanized steel pipe and shall be powder-coated black steel pipe. No short lengths, tubing, conduit or open seam material will be permitted.

- .1 Post and rail sizes shall be as follows:
 - .1 For passive/active public/non-public areas which are 1200 mm or 2400 mm and higher:
 - .1 Corner and gate posts shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .2 Line posts shall be 60 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .3 Top and bottom rails and horizontal braces shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .2 Baseball diamond backstop which are 4600 mm and higher:
 - .1 Corner and line posts shall be 114 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .3 Post extensions for the overhang shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe. At connection install welded 13 mm plate steel gussets as per the drawings herein. Overhang horizontal rails and bracing shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .3 Soccer playing field backstop which are 6000 mm and higher:
 - .1 Corner and line posts shall be 89 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
 - .2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.

Delete 2.1.5 and
replace with the
following

Delete 2.1.6 and
replace with the
following

Delete 2.1.7 and
replace with the
following

Delete 2.1.8 and
replace with the
following

Delete 2.1.9 and
replace with the
following

.2 Bottom tension wire: single strand, black vinyl gated
galvanized steel wire, 6 gauge (4.5mm Diameter).

Tie wire fasteners shall be single strand, black
vinyl coated galvanized aluminium or steel wire
conforming to requirements of fence fabric.

Tension bars: 4.76 x 19 mm minimum galvanized black power coated
steel.

Tension bar bands: 3 x 20 mm galvanized black powder coated steel
or 5x20 mm minimum black powder coated aluminium.

Install the chain link fence person gates and vehicle gates as shown
on the *Contract Drawing*.

.1 Chain Link Vehicle Gates.

- .1 The vehicle gates shall not be used as a centre post. The
closure device shall be operated by securing the gates
together when in the closed position. The closure device
shall be operated independent of the locking pins.
Closure device must accept a standard padlock.
- .2 The vehicle gate is to have locking pins with locking pin
aluminum sleeves recessed 25 mm into the concrete
walkway to secure the gates in the open and closed
positions. The top of the sleeve shall be flush with the
surrounding concrete surface. The locking pin rod shall be
spring-loaded so that the pin is always in the raised
position unless pushed and turn locked into place, as per
the drawings herein.
- .3 The vehicle gate shall be to the full height of the fence and
shall not be bridged with a top rail over it as to eliminate
any restrictions on the height of objects passing through
the gate.
- .4 The vehicle gate is to operate on wheels which fully
support the weight of the gate. The wheels must be
suitable for use on concrete surfaces and must not mark
the concrete surface.
- .5 Vehicle gates shall not have signage inserts.
- .6 All hinges shall be welded into place.

.2 Chain Link Person Gates.

- .1 The person gates are to have clear openings of 1219 mm.
- .2 The person gates shall be used as a closure device to
operate by securing the gate to the gate post when in the
closed position. The closure devices shall be operated
independent of the locking pins. Closure device must
accept a standard padlock.
- .3 The person gates shall have locking pins with locking pin
aluminum sleeves recessed 25 mm into the concrete
walkway to secure the gates in the open and closed
positions. The top of the sleeve shall be flush with the
surrounding concrete surface. The locking pin rod shall be
spring-loaded so that the pin is always in the raised
position unless pushed and turn locked into place, as per
the drawings herein.
- .4 For soccer playing field entry gates, the gates shall not
have locking pins for the open positions. Field entry gates
shall be able to swing 180 degrees wide and lock open by
attaching to main fence line.

		.5	The person gates shall be to the full height of the fence and shall not be bridged with a top rail over them as to eliminate any restrictions on the height of objects passing through the gate.
			All hinges shall be welded into place.
	Delete 2.1.10 and replace with the following		All fastenings and fittings shall be hot dip galvanized. All caps shall be powder coated black and welded in place.
	Add 2.2.4		Powdercoating:
		.1	Powdercoat all exposed surfaces. Powder coating to use powdercoat paint on acid washed surfaces. Wash and coating shall be completed on a conveyor system. Dipping is not acceptable. Finish must be baked dry. Colour shall be black except for backstop signage and signage inserts which are to have <i>Owner</i> selected custom colours.
		.6	The powder-coat finish must not crack or chip when scratched tested.
	Add 2.2.5		Organic zinc rich Galvicon paint coating: to CGSB 1_GP-181M shall be applied to all joints, welds and damaged areas. Two coats are required. Paint to have a high gloss finish. Use black or a custom colour as necessary to match the surrounding powder-coating.
2.2	Finishes		
	Delete 3.1 and replace with the following	.2	
		.1	Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
		.2	Accurately survey and layout the specified work as shown on the <i>Contract Drawing</i> .
			The installation procedures for all materials must be in strict accordance with the manufacturer's specifications and provide for a long-term successful installation of all materials.
EXECUTION	Delete 3.2 and replace with the following	.1	Erect fences along lines as shown on the <i>Contract Drawing</i> and in accordance with CAN/CGSB-138.3.
		.2	Space straining posts at equal intervals not exceeding 150 metres if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 150 metres.
		.3	Install end posts at end of fence and at changes in fence alignment. Install gate posts on both sides of gate openings.
		.4	Embed posts into concrete to depths indicated. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
		.5	Do not install fence fabric or pickets until concrete has cured a minimum of 5 days.
		.6	Install intermediate rail between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface. Install intermediate rails on both sides of corner and straining posts in similar manner.
		.7	Install and weld overhang tops and caps.
		.8	Install rails between posts and weld securely to terminal posts and secure waterproof caps and overhang tops.
		.9	Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. Knuckled selvedge at bottom. Twisted selvedge at top.
		.10	For sport activity fencing provide clearance between bottom of fence and concrete curb neither less than 15 mm nor more than 40mm. In other areas provide 50 to 75 mm clearance

			between the bottom of the fence and the ground. The clearance under all rails shall be consistent.
			.11 Secure fabric to rails and posts with tie wires as follows. Give tie wires a minimum of two twists.
			.1 At every knuckle for 50 mm opening mesh.
			.2 At every second knuckle for 38 mm opening mesh.
			At every fourth knuckle for 25 mm opening mesh.
3.1	Grading	Add 3.3	.1 Cut tie wires and remove existing fabric. Take care not to stretch or otherwise damage the fabric. Do not re-use damage portions of existing fabric.
			.2 Cut fabric to length and height as required. Ensure cut edges are properly and securely tied. Attach fabric as per the specifications herein.
			.3 All surplus fabric shall be rolled up into roll sizes that are manageable by one person and handed over to the City if, requested to do so. Damaged fabric shall be disposed of off-site.
3.2	Installation of Fence	Add 3.4	.1 Cut existing posts and rails taking care to maximize the usable length of the existing post or rail. Do not re-use damage posts or rails.
			.2 Cut posts and rails as required. Prepare surfaces and powder-coat as per the specifications herein. Install posts and rails as per the specifications herein. 2400 mm post spacing can be adjusted to accommodate re-used rails. Ensure that where spacing is adjusted it is consistent and in one section of fence.
			.3 Dispose of damaged or surplus posts, rails, and mesh off-site.
3.3	Removal and Re-use of Usable Existing Chainlink Fabric	Add 3.5	.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of black high gloss organic zinc-rich Galvicon paint to damaged areas, allowing the manufacturer's recommended drying time between coats. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.
			.2 Wire brush, clean, and paint all welds with two coats of high gloss zinc rich Galvicon paint, allowing the manufacturer's recommended drying time between coats. Use paint colour that matches surrounding powder-coated surfaces.
			.3
3.4	Removal and Re-use of Usable Existing Chainlink Posts and Rails	Add 3.6	Upon completion of the work remove all containers, surplus materials, and installation debris, etc. Project area must be left in a clean and orderly condition.
			.3
3.5	Touch Ups	Add 3.7	Upon completion of the work, the <i>Contractor</i> shall provide the <i>City</i> with maintenance materials consisting of the following.
			.1 Two (2) 500 ml cans of black high gloss organic zinc-rich paint.
			.2 One (1) 500 ml can of high gloss organic zinc-rich paint of each custom colour.
			.3 Four (4) packages of 50 tie wires.
3.6	Site clean-Up	Add 3.8	.1 The <i>Contractor</i> is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work and from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.
			.2 Acceptance of the repair work is at the sole discretion of the <i>Contract Administrator</i> and the City. All repairs must be

completed and accepted prior to *Total Performance* of the Work being granted.

3.7 Maintenance Supplies Add 3.7

Upon completion of the work, the *Contractor* shall provide the *City* with maintenance materials consisting of the following.

- .1 Two (2) 500 ml cans of black high gloss organic zinc-rich paint.
- .2 One (1) 500 ml can of high gloss organic zinc-rich paint of each custom colour.
- .3 Four (4) packages of 50 tie wires.

3.8 Protection Add 3.8

- .1 The *Contractor* is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work and from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage.
- .2 Acceptance of the repair work is at the sole discretion of the *Contract Administrator* and the *City*. All repairs must be completed and accepted prior to *Total Performance* of the Work being granted.

END OF SECTION

1.0 GENERAL

1.0 General Requirements

Delete 1.0.1 and replace with the following

- .1 Section 32 91 21 refers to those portions of the *Works* that are unique to the supply, placement and finish grading of *Growing Medium*. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the *Works* described herein.

For the purpose of this specification, the term "*Growing Medium*" shall mean a soil produced offsite by homogeneous blending of mineral particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth and the term "*Topsoil*" shall mean on-site native or surface soil material which may be used as *Growing Medium* provided it meets standards set for imported material *Growing Medium* and can be modified to meet the requirements set out for specified *Growing Medium*.

Add 1.0.3

- .3 For the purpose of this specification, the term '*Soil-Testing Laboratory*' shall mean an independent laboratory, recognized by the landscape nursery industry, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

1.4 Measurement and Payment

Delete 1.4.1 and replace with the following

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

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 <i>Contract Administrator</i> and the City submit up to two (2) additional samples, at intervals outlined by the <i>Contract Administrator</i> and the City, of <i>Growing Medium</i> taken from material delivered to the site. Samples shall be taken from 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 <i>Contract Administrator</i> and the City for review. |
| | | | .7 | The <i>Contractor</i> is responsible for soil analysis and requirements for amendments to supply <i>Growing Medium</i> as specified. Failure to satisfy these contractual requirements could result in the <i>Contractor</i> being required to remove unacceptable <i>Growing Medium</i> at their expense. |
| | | | .8 | Notify the Contract Administrator at least forty-eight (48) hours prior to <i>Growing Medium</i> 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 <i>Growing Medium</i> in an excessively wet, extremely dry, frozen condition or in any manner in which structure may be adversely affected. <i>Growing Medium</i> whose structure has been damaged by handling under these conditions shall be rejected and shall be replaced by the <i>Contractor</i> 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 <i>Growing Medium</i> and amendments from wind blown soil particles, weed seeds and from insects. Contamination of the <i>Growing Medium</i> and amendments may result in their rejection for use. |
| | | | .4 | Store fertilizer and chemical amendments in the manufacturer's original containers. |
| | | | .5 | All <i>Growing Medium</i> shall be delivered to site <u>premixed</u> from a recognized <i>Growing Medium</i> source ensuring consistency throughout the mix. |
| 2.0 | PRODUCTS | Delete 2.0 and replace with the following | | |
| 2.1 | Materials | | .1 | <i>Growing Medium</i> 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 <i>Growing Medium</i> 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*.

- 2.2 Nutrient Requirements**
- .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.
 - .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 Grades*. 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 cusped 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 <i>Growing Medium</i> 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 <i>Growing Medium</i> .	
			.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 <i>Growing Medium</i> .	
3.6	Finish Grading	Delete 3.6.1 and replace with the following		Manually fine grade <i>Growing Medium</i> installation to contours and elevations shown on drawings or as directed by <i>Contract Administrator</i> and the City. Eliminate rough spots and low areas to ensure positive drainage.	
		Add 3.6.3		<i>Finish Grade</i> of <i>Growing Medium</i> 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 <i>Growing Medium</i> installation have been removed.	
			.2	Dispose of materials not required and repair any damage to adjacent surfaces (as determined by the <i>Contract Administrator</i> and the City) off site at no additional cost to the <i>Owner</i> .	
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 <i>Growing Medium</i> .	
			.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

- | | | |
|------------------------------------|---|---|
| 1.5 Drainage Control | Delete 1.5.1 and replace with the following | Provide for proper water management and drainage at <i>Place of Work</i> . 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 is detained and cleaned prior to discharge from <i>Place of Work</i> . |
| 1.7 Site Examination | Delete 1.7.1 and replace with the following | Examine <i>Place of Work</i> prior to the commencement of work to verify surface preparation is complete and has been accepted by the <i>Contract Administrator</i> and the City. |
| 1.8 Measurement and Payment | Delete 1.8 and replace with the following | Payment for all work performed under this section will be incidental to payment for the work described in other Sections. |
| 1.10 Quality Assurance | Add 1.10 | <p>.1 <i>Contractor</i> to provide seed analysis that will include but is not limited to:</p> <ul style="list-style-type: none"> .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 <p>.2 The sample accepted by the review will form the standard by which the project will be supplied.</p> <p>.3 Should the <i>Contractor</i> require the source of seed supply to change during the construction a written request must be provided to the <i>Contract Administrator</i> and the City 48 hours in advance. The request shall be followed up by submission of proposed seed supplier and substitution seed analyses for <i>Contract Administrator</i> and the City review prior to the delivery.</p> <p>.4 All seed shall be delivered and stored in original containers in enclosed storage facility protected from the damage, weather, insects and rodents.</p> |

2.0 PRODUCTS

- | | | |
|-----------------------|---|---|
| 2.1 Grass Seed | Delete 2.1 and replace with the following | <p>.1 Grass seed shall be Certified Canada No. 1 Grade to Government of Canada, Seeds Regulations and having minimum germination of 75% and minimum purity of 95%.</p> <p>.2 Seed mixtures shall be approved by the <i>Contract Administrator</i> and the City 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 the list of approved varieties shown below:</p> <ul style="list-style-type: none"> .1 Seed Mix shall comprise of: <ul style="list-style-type: none"> 50% Perennial Rye: Elka II, Gator 3, Top Hat, Charismatic, All Star, Derby Supreme |
|-----------------------|---|---|

SEEDING

35% Fescues: Cindy, Longfellow II, Cindy Lou, Quatro, Shademaster II

15% Kentucky Bluegrass: Shamrock, Broadway, Midnight, Julius, Allure

.3 Table Guideline of Approved Seed Mix Ratios

<u>% Seed Count</u>	<u>% Weight</u>	
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
Seed Rate: 50g per square metre		
Acceptable products shall be an all purpose sun / shade mix conforming to the above mix ratios		

2.2 Water Delete 2.2.1 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.

2.3 Fertilizer Delete 2.3.1 and replace with the following

Fertilize shall be complete synthetic slow release fertilizer. Type and application shall be as required by the growing medium analysis report.

2.4 Wooden Posts Add 2.4

.1 Wooden Posts shall be 38 mm x38 mm x 1500 mm long No. 1 grade or better Hem/fir, untreated wood.

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
Add 3.2.3.1

Prior to the broadcast of seed *Contract Administrator* and the City to review fine grading of growing medium. 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 carried out, firm against footprints, textured and free loose of all stones, roads, 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

Seeding operations shall be carried out in the following calendar seasons;

- .1 Spring (April 1st to June 15th)
- .2 Fall (August 15th to September 30th)
- .3 Seeding shall not take place during periods of rain, freezing and/or abnormally hot and dry weather.

SEEDING

	Delete 3.2.2 and replace with the following	Application Methods: Apply seed by Method A – Mechanical Dry Seeding or Method B – Hydraulic Seeding unless otherwise specified. Ensure Hydraulic Seeding in accordance with Section 32 92 19 – Hydraulic Seeding. Hand seeding is not recommended. Hand seed only when site conditions preclude above two methods. Do not use hand seed method unless approved by the <i>Contract Administrator</i> .
	Delete 3.2.3 and replace with the following	Seed Application: Seed rates as per seed manufacturers' recommendations and table 2.1.3. .1 Sow seed during calm weather with wind speeds less than 8 kph, using wheeled or hand held rotary broadcaster. .2 Sow half of required amount of seed in one direction and remainder at right angles. .3 Carefully incorporate seed into top of growing medium with light chain harrow or wire rakes to a minimum depth of 6 mm as seeding operation progresses or within one (1) hour after seeding. .4 Immediately after seed application roll seeded area with 90kg water ballast type lawn or agricultural roller. If seeded area becomes wet due to rain suspend rolling operations until area has dried to the point where growing medium will not adhere to the surface of the roller.
	Add 3.2.4	Watering Operation: Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure penetration of minimum 50mm into growing medium and be at sufficient duration and intervals to keep growing medium evenly moist during germination and grow in period.
	Add 3.2.5	The <i>Contractor</i> shall carry out at no cost to the <i>Owner</i> , reseed operations at two (2) week intervals where germination has failed or wash outs have occurred.
	Add 3.2.6	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 shall 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 issued <i>Total Performance</i> of seeded area by <i>Contract Administrator</i> . Upon acceptance remove perimeter fence and dispose of off site.
	Add 3.2.7	Seeded areas that have been damaged by construction operation, construction/ site personnel or construction traffic shall be replaced at no cost to the <i>Owners</i> . Replacement shall include removal of growing medium, regarding of sub grade, replacing growing medium and reseeded as required.
3.6	Grass Maintenance	Delete 3.6 and replace with the following .1 Maintenance of seeded areas shall begin immediately after seeding operation and shall continue until all deficiencies noted in the <i>Substantial Performance</i> review have been rectified to the satisfaction of the <i>Contract Administrator</i> and the City and conditions for <i>Total Performance</i> been achieved. The <i>Contractor</i> shall notify the <i>Contract Administrator</i> and the City in writing forty eight hours (48) prior to stopping maintenance operations. .2 Maintenance shall follow the BC Landscape Standard, current edition, Level 2 'Groomed'. Over and above this maintenance

SEEDING

protocol the *Contractor* shall monitor the application of water to the seeded areas and ensure that watering procedures are continuous.

- .1 Apply water with fine spray to avoid seed wash out. Watering procedure shall ensure penetration of minimum 50mm into growing medium and be at sufficient duration and intervals to keep growing medium evenly moist during germination and grow in period.
- .2 Monitor watering on a regular interval to ensure that watering operations are not causing wash out of seeded area. Should wash outs occur as a result of watering or rain fall related wash out, reseed and continue maintenance and watering procedures.

- .3 Grass Cutting: After the 'first' cut of seeded areas grass cutting operations shall be carried out on a weekly (seven day) basis until *Total Performance* by *Contract Administrator* and the City.

- .1 First cut of seeded areas shall occur when a uniform grass height of 75 mm has been attained. First cut shall be to a height of 64 mm
- .2 Continue regular weekly cutting at a height of 50 mm until *Total Performance*.
- .3 Cutting operations shall be such that each cut is at right angles to the previous cut.
- .4 *Contractor* to remove grass clippings after each cut and dispose of off site.
- .5 Roll when required to remove any minor depressions or irregularities.
- .6 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches the original seed mix.

- .4 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.

- .5 Seeded 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.

3.7 Conditions for Total Performance

Delete 3.7 and replace with the following

- .1 Conditions for *Total Performance* of Seeded areas:
 - .1 Seeded areas are vigorously growing, well established with a thick, dense and healthy green appearance.
 - .2 Seeded areas shall not have any eroded or wash out areas, bare or dead spots and are free of invasive and/or noxious broadleaf weeds and grasses.
 - .3 No surface growing medium is visible when established seeded areas have been cut to height of 38 mm
 - .4 Seeded areas have been cut at least two (2) times, to a height of 38 mm a minimum of (7) days apart.
 - .5 Grass shall be free of grass varieties other than those specified.
 - .6 Grass shall be sufficiently established that its roots are growing into underlying growing medium.
 - .7 Specified maintenance procedures have been carried out.

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- .8 Areas seeded after September 30th will be not be reviewed
for *Total Performance* until April 30th the following year.

END OF SECTION

SODDING

1.0	GENERAL	Delete 1.0.2 and replace with the following	This section is based on the "British Columbia Landscape Standards and the B.C. Nursery Trades Association. This standard is intended to set a level of quality which is equalled or bettered in the construction documents.
1.4	Handling and Storage	Delete 1.4.3 and replace with the following	Schedule sod deliveries such that sod installation occurs within twenty-four (24) hours of being lifted from the source sod farm.
		Delete 1.4.4 and replace with the following	Sod shall be neatly stacked or rolled at the source sod farm, delivered and unloaded on sturdy pallets which are no more than 3 pallets high.
1.5	Drainage Control	Delete 1.5.1 and replace with the following	Provide for proper water management and drainage of site during work of this section. Water management shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance to ensure that storm water which may become laden with soil, growing medium or hydraulic seed is detained and cleaned prior to discharge from <i>Place of Work</i> .
1.6	Samples	Add 1.6.2	Submit one (1) square metre of sod to the <i>Contract Administrator</i> and the City for review. Ensure sample is complete with name of sod farm, base soil type, seed mix percentage.
		Add 1.6.3	<i>Contract Administrator</i> 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 <i>Contractor</i> require the source of sod supply to change during the construction a written request must be provided to the <i>Contract Administrator</i> 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 <i>Contract Administrator</i> and the City review prior to the delivery.
1.8	Measurement and Payment	Delete 1.8.1 and replace with the following	Payment for all work performed under this section will be incidental to payment for the work described in other Sections.
2.0	PRODUCTS		
2.1	Sod	Delete 2.1.1 and replace with the following	Sod to be approved by the <i>Contract Administrator</i> 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

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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. <i>Contractor</i> to ensure adequate water is available to maintain seeded areas during germination and in a vigorously growing, healthy state until <i>Total Performance</i> 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 <i>Contract Administrator</i> and the City to review and direct minor adjustments and refinements of finish grades prior to the <i>Contractor</i> proceeding. Review includes grades, growing medium depth and condition of finished surface. Subsequent to the <i>Contract Administrator</i> and the City review the <i>Contractor</i> shall re-grade, add growing medium and make adjustments as directed by <i>Contract Administrator</i> 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 <i>Contract Administrator</i> 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 <i>Contract Drawing</i> . 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.

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- .3 Cut out irregular or thin sections with a sharp knife.
 - .4 Cut sod to fit tight around landscape elements.
 - .5 Cut sod to create clean, smooth lines along all plant beds.
 - .5 Placement of Sod on Slopes:
 - .1 Lay sod with the length of each sod section parallel to slope taking extra care to ensure that sod sections are butt tight and each sod section is set in a staggered formation.
 - .2 On slopes exceeding 3:1 gradient ensure sod is secured with wooden pegs at intervals of not more than 450 mm along the center of each section. Ensure wooden pegs are driven flush with the sod.
 - .3 Prior to acceptance of sod areas that have been secured with wooden pegs either remove the wooden pegs or drive each wooden peg at least 50 mm below finished grade.
 - .4 Where required, place erosion control mesh or netting and secure with stakes or staples sunk firmly into ground to a minimum depth of 150 mm at maximum intervals of 4 meters along pitch of slope. Place stakes or staples horizontally across slope at intervals equal to width of mesh or netting minus 150 mm and drive flush with top of sod.
 - .6 Use a light roller to ensure that there is full, close contact between sod and growing medium. Use of a heavy roller to correct irregularities in grade is not permitted.
 - .7 Ensure all sodded areas are watered immediately after installation. Verify that water applied to has penetrated through sod into top 100 mm of growing medium. Continue watering operations as needed to ensure that adequate moisture content is maintained 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, regrading 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.
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- | | | | | |
|-----|--------------------------|---|----|---|
| 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 <i>Substantial Performance</i> review have been rectified to the satisfaction of the <i>Contract Administrator</i> and the City and conditions for <i>Total Performance</i> have been achieved. The <i>Contractor</i> is to notify the <i>Contract Administrator</i> 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 <i>Total Performance</i> by <i>Contract Administrator</i> and the City: |

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- .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 Administrator* and the City, sodded areas shall be surrounded by a 900 mm high barrier made up of the following components:
 - .1 Wood posts placed at 1.8 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.

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			<p>.6 Sodded areas have been cut a minimum of two (2) times, at seven (7) day intervals.</p> <p>.7 Sodded areas are a uniform green colour with no discoloured sections or patches.</p> <p>.8 Sodded areas exhibit a thick, dense, uniform and healthy appearance.</p>
		Add 3.5.2	Lawns sodded after September 30 th will be not be reviewed for <i>Total Performance</i> until April 30 th the next year.
3.6	Guarantee / Maintenance	Delete 3.6.1 and replace with the following	The <i>Contractor</i> hereby guarantees that the sod will remain free of weeds and defects for a period of one (1) year from the date of <i>Substantial Performance</i> . The <i>Contractor</i> shall make all corrections, adjustments and replacements required as a result of failure of all products in this section. During the <i>Maintenance Period</i> , the <i>Contractor</i> will replace sodded areas, determined by <i>Contract Administrator</i> and the City, to be dead or failing at the end of the <i>Maintenance Period</i> . 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 <i>Contractor's Maintenance Period</i> 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

PLANTING OF TREES, SHRUBS AND GROUND COVERS

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 <i>Contract Drawing</i> 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	<p>.1 Seven (7) days prior to the <i>Contract Administrator</i> and the City review of plant material at source the <i>Contractor</i> shall confirm in writing availability of plant material noted on plant list.</p> <p>.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.</p> <p>.1 Prior to the review of plant material by the <i>Contract Administrator</i> and the City the <i>Contractor</i> 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.</p> <p>.2 The documentation submitted shall include but is not limited to the nurseries CNCI Clean Plants certification number.</p> <p>.3 Plant Material Review at the source nursery.</p> <p>.1 <i>Contractor</i> shall request for review of the plant material at source nursery to be a minimum of seven (7) days prior to scheduled review.</p> <p>.2 Shipping of plant material to the <i>Place of Work</i> shall not proceed until <i>Contract Administrator</i> has reviewed the plant material at the source nursery.</p> <p>.3 <i>Contract Administrator</i> and the City shall make one (1) visit to source nursery for review of plant material for entire project.</p> <p>.4 All plant material, including substitutions shall be gathered at one location for review.</p> <p>.5 <i>Contractor</i> shall accompany <i>Contract Administrator</i> during plant material review at the source nursery.</p> <p>.4 Plant Material Review at the <i>Place of Work</i></p> <p>.1 All plant material shall be reviewed at the <i>Place of Work</i> by the <i>Contract Administrator</i> and the City prior to planting.</p> <p>.2 Plant material that is rejected by the <i>Contract Administrator</i> shall be immediately removed from the</p>

- 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.

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| | | | .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 | <i>Contractor</i> to submit a one (1) litre sample of Composted Mulch to the <i>Contract Administrator</i> and the City for review prior to delivery. |
| | | | .2 | <i>Contractor</i> to submit a one (1) litre sample of the Prepared Growing Medium to the <i>Contract Administrator</i> and the City for review prior to delivery. |
| | | | .3 | <i>Contractor</i> to submit three (3) copies of the anti-desiccant manufacturer product data and specification for <i>Contract Administrator</i> and the City review. |
| | | | .4 | <i>Contractor</i> to submit three (3) copies of the fertilizer manufacturer product data and specification for <i>Contract Administrator</i> and the City review. |
| | | | .5 | <i>Contractor</i> to submit three (3) copies of the Guying assembly including clamps, collar, guying wire, anchors and wire tighteners manufacturer product data and specifications for <i>Contract Administrator</i> 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 <i>Contract Administrator</i> and the City. Rejected plant material shall be replaced by the <i>Contractor</i> . |

PLANTING OF TREES, SHRUBS AND GROUND COVERS

1.9	Measurement and Payment	Add to 1.9	Payment for all work performed under this section will be incidental to payment for the work described in other Sections.	
1.11	Substitutions	Add 1.11	.1	If it is impossible to obtain the particular plant material listed on the Landscape Drawing, the <i>Contractor</i> may be permitted to suggest substitutions with types and variations possessing the same characteristics. The <i>Contractor</i> 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 <i>Contract Administrator</i> 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 <i>Contract Administrator</i> and the City and tagged for the project is to have the identification tags removed only after inspection and instruction by the <i>Contract Administrator</i> and the City after delivery to the <i>Place of Work</i> .
1.14	Plant Material Replacement	Add 1.14	1.	The <i>Contractor</i> shall remove from the <i>Place of Work</i> and immediately replace any plant material that has been determined by the <i>Contract Administrator</i> and the City to have died or failed to grow in a satisfactory manner during the guarantee or maintenance period.
			.2	The <i>Contractor</i> shall extend the guarantee on this replacement plant material for one (1) year from the date of replacement.
			.3	The <i>Contractor</i> shall continue such replacement and guarantee of plant material until the <i>Contract Administrator</i> and the City has determined that the <i>Conditions for Total Performance</i> 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 <i>Contractor</i> until the date of <i>Substantial Performance</i> .
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 <i>Place of Work</i> is acceptable provided:
			.1	Plant material is moved to the <i>Place of Work</i> 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 broadleaved evergreens over 2.4 metres tall shall be dug with firm soil root ball.
 - .2 Deciduous trees in excess of 3.0 metre height shall be dug with firm soil root ball.
 - .3 Root ball diameter shall be a minimum of 230 mm (for each 25 mm caliper size.
 - .4 Secure root-balls with burlap, heavy twine and rope.

			.5 Large tree root balls shall be double layer burlap wrapped. Burlap to be secured with drum laces made up of 10 mm (minimum) diameter rope.
			.9 Tree Spade Dug Plant Material
			.1 Plant material shall be dug with mechanized hydraulic spade or clamshell type digging equipment.
			.2 Root ball diameter shall be a minimum of 230 mm for each 25 mm caliper size.
			.3 Wire basket shall be lined with burlap. Root ball shall be laced and tied to wire basket with heavy rope.
			.4 Ensure trunk of tree is not damaged by wire basket, ties or rope.
2.2	Water	Delete 2.2.1 and replace with the following	Potable and free of minerals and impurities which are detrimental to plant growth.
2.3	Fertilizer	Add 2.3.2	Fertilizer shall be prolonged-release fertilizer tablets containing a minimum of 20% nitrogen, 10% phosphoric acid, and 5% potash (20-10-5) as per Approved Products List. Store in weatherproof storage space.
2.4	Mulch	Delete 2.4.1 and replace with the following	Composed mulch shall be 9 mm black/brown in colour with no cedar or redwood bark or wood material as per Approved Products List.
2.5	Stakes	Delete 2.5.1 and replace with the following	Stakes shall be pressure treated Hem/Fir, 75 mm dia. round, 2500 mm long. Stake fasteners shall be hot dipped galvanized or stainless steel.
2.8	Guying Wire	Delete 2.8.1 and replace with the following	Guying wire 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.
3. 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.
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- 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.

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| | | | .3 All fine grading shall be completed, the growing medium shall be loose and friable. |
| | | | .4 The <i>Contract Administrator</i> 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 <i>Owner</i> . |
| 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 <i>Substantial Performance</i> review have been rectified and the <i>Contract Administrator</i> and the City has provided to the <i>Contractor</i> written confirmation of the date of <i>Total Performance</i> . |
| | | .2 | If for any reason the <i>Contractor</i> elects, on his own without the written consent of the <i>Contract Administrator</i> and the City to suspend maintenance operations, the <i>Contractor</i> shall provide the <i>Contract Administrator</i> 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 <i>Contractor</i> at no cost to the <i>Owner</i> . |
| | | .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. |

3.10 Conditions for Total Performance

Delete 3.10 and and replace with the following

- .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.
- .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

**1.8 Measurement and
Payment**

Delete 1.8.2 and
replace with the
following

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

Payment for watermain will include location and exposure of existing utilities, sawcutting and disposal of existing pavement, trench excavation, offsite disposal of native excavated material and surplus/displaced excavated material, dewatering, bedding, supply and installation of pipe, polyethylene encasement, tracer wire, bolts, gaskets, thrust blocks, couplings, restraints and tie rods, supply, cleaning, pressure and leakage testing, flushing, disinfection where required, granular base, granular sub-base, all surface restoration as specified under Section 31 23 01 – Sub-section 3.6, COQ-G4, asphalt curb, concrete curb & gutter, concrete sidewalk, grass restoration using seed, 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 be at the sole discretion of the Contract Administrator. All cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free from organic materials. Native excavated material shall not be used as trench backfill where moisture content does not permit compaction to specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density.

Payment for imported trench backfill will be made under Section 31 23 01S – Sub-section 1.10.9.

Pressure and leakage testing cannot be performed against live valves.

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 fittings, unless specified in the Schedule of Quantities and Prices, performed under this section will be incidental to payment for work described in other Sections.

Measurement will be for each respective item installed without deduction of length of valves and fittings from length of pipe measured for payment under 1.8.1 and 1.8.2 in this Section.

Add 1.8.3.1

Payment for disposal of blow-down assembly and chamber, removal of castings and valve boxes, which fall outside of excavations related to other items in the Schedule of Quantities will include all backfilling, compaction, and surface restorations.

Delete 1.8.4 and add
1.8.4.1

Payment for service connection includes mainline saddles, corporation stops, curb stops, Municipex service pipes c/w #10 AWG tracer wire, and all related fittings and appurtenances specified

			and/or shown on Standard Detail Drawing Coq-W2I. Payment includes all applicable work described under 1.8.2 of this Section.
		Delete 1.8.4 and add 1.8.4.2	Payment for transfer of existing copper service includes mainline saddles, corporation stops, and all related fittings and appurtenances specified and/or shown on Standard Detail Drawing Coq-W2b. Payment includes all applicable work described under 1.8.2 of this Section.
		Add 1.8.15	<p>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, capping and removal of existing hydrants, 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.</p> <p>Payment for capping and removal of existing fire hydrant including all necessary surface restorations as indicated in the requirements in 1.8.2 of this Section will be considered as incidental.</p> <p>Measurement will be made at the unit price bid for each hydrant assembly installed.</p>
2.0	PRODUCTS	Add 1.8.16	Payment for all tie-ins and wet taps to existing watermain will include all pipe materials, fittings, mechanical couplings, test points, temporary blow off assembly, excavation to expose the existing main to confirm location, grade, size, material and condition, capping of existing watermain. Payment will be made per a Lump Sum basis for each tie-in or wet tap connection. Pressure and leakage testing cannot be performed against live gate valve.
2.2	Mainline Pipes, Joints and Fittings	Add to 2.2.1.1	<p>Pipe: to AWWA C151, and shall meet the following Pressure Class or Thickness Class:</p> <ol style="list-style-type: none"> .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	<p>Joint Restrain Devices: General Requirements:</p> <ol style="list-style-type: none"> .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

			<ul style="list-style-type: none"> .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.
2.3	Valves and Valve Boxes	Add 2.2.7	<p>Oriented Polyvinyl (PVC) Pressure Pipe:</p> <ul style="list-style-type: none"> .1 Pipe: <ul style="list-style-type: none"> .1 Pipe to be manufactured to specifications for pipe size ranges as follows: <ul style="list-style-type: none"> .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 apécial 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.
		Delete 2.3.1.3 and replace with the following	Valves 400 mm and larger shall be butterfly valves.
		Delete 2.3.1.4	
		Delete 2.3.4 and replace with the following	Blow-Down or Blow-Off Valves: 50 mm to 300 mm as specified for mainline gate valves.
		Delete 2.3.6.1.1	
		Delete 2.3.6.1.2 and replace with the following	Circular type valve box shall be Nelson style cast iron.
		Delete 2.3.7.1 and replace with the following	Curb stop valve boxes on 19 mm dia. to 38 mm dia. shall be as shown on Coquitlam Standard Detail Drawings COQ-W2b, COQ-W2j.
		Delete 2.3.7.2 Delete 2.3.7.3 and replace with the following	Curb stop valve boxes (300 mm from property line) alternative on 19 mm dia. to 38 mm dia. services without operating rods to be assembled as specified for Mainline Valve Boxes 2.3.6.1.2, and shown

2.6	Hydrants	Delete 2.3.7.5 and replace with the following	on Coquitlam Standard Detail Drawings COQ-W2b, COQ-W2j. Service boxes may be Nelson style PVC, except when located in driveways. Corporation stop valve boxes (at mainline tees or tapings) on services 50 mm dia. and larger as specified for Mainline Valve Boxes per Coquitlam Standard Detail Drawings COQ-W2e, COQ-W2f.
		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.
2.8	Granular Pipe Bedding and Surround Material	Delete 2.6.2 and replace with the following	Colour: Tremclad Rust Paint Body – Fire Red Hose Caps and Bonnet – Bright Yellow
3.0	EXECUTION	Add 2.8.3	Bedding and pipe surround to be MMCD Pit Run Sand 31 05 17 (2.4). Sechelt Sand is acceptable.
3.6	Pipe Installation		
3.10	Service Connection 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.
		Delete 3.10.4	
		Delete 3.10.5 and replace with the following	
3.18	Cleaning and Preliminary Flushing	Add 3.10.13	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 3.18.5	Water service connections (19 mm and 25 mm) must be installed as one continuous length of pipe. Water mains 400 mm and larger shall be swabbed as per the following procedure:
3.23	Connection to Existing Mains		1. <u>Purpose and Scope</u> .1 To remove any possible contaminants introduced into the water main through pipe storage or installation activities. 2. <u>Swab Requirements</u> .1 Swabs are to be of a polyurethane foam construction, minimum 2 lb/ft ³ density .2 Swabs are to be new. Used swabs will not be accepted. .3 Swab outside diameter must be minimum 1 nominal size larger than the largest diameter main to be swabbed (eg. 150 mm main requires minimum 200 mm diameter swabs) .4 Swab length must be minimum 1.5 times the outside diameter. 3. <u>Swab Entry Point</u>

- .1 2 swabs are to be inserted into the beginning of the first length of water main installed into the trench. Swabs are to have a minimum of 1 metre 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.

Delete 3.23.1 and replace with the following

Connections to existing waterworks systems will be made by the Contractor under the supervision of the Contract Administrator. Make all necessary arrangements with the Contract Administrator and the City to schedule work to prevent construction delays.

Add 3.23.2

Provide written notification to all affected residents a minimum 48 hours prior to service interruption.

Add 3.23.3

Arrange shutdown of the existing valves by the City. *Contractor* shall not operate any valves without prior approval of the *Contract Administrator* and the City.

Add 3.23.4

Provide temporary water service while existing service is interrupted as detailed in *Contract Drawing* or Project Specific Specifications.

Add 3.23.5

Fittings used for tie ins should be cleaned of all foreign material and sprayed with a 1% hypochlorite solution prior to assembly. Disinfect all pipes and fittings installed at the connection.

Add 3.23.6

Contractor shall be responsible for the costs for the City to flush and purge all air from existing mains and services in the area affected by the water service interruption.

Add 3.23.7

Procedures for Bacteriological Tests shall be as described in AWWA C651-99. No connection to existing water mains will be authorized until final results of coliform bacterial testing have been received and reviewed by the Water Superintendent.

All samples shall be taken by the City Water Utility.

All valve operation shall be handled by the City Water crews.

The *Contractor* shall provide sampling points, one every 366m plus the end of each main segment. The *Contractor* shall provide all labour to temporarily connect and disconnect the new main in order to properly acquire test samples.

WATERWORKS

Initial flushing, testing and chlorination will be undertaken by the *Contractor* from a water source approved by the Water *Superintendent*.

Coordination for the bacterial testing and tie in shall be coordinated by the project Engineering Inspector and the Water *Superintendent* prior to final flushing.

The *Contract Administrator* shall review with the Water *Superintendent* and the *Contractor* sampling locations and appurtenances.

The *Contract Administrator* shall check and record chlorine residual prior to final flushing.

After final flushing the City Water crew will collect two sets of samples 24 hours apart. Samples will be taken at least every 366m of the new main as well as the terminus and all branches.

Test results will be delivered to the Water Superintendent who will provide a copy to the Contract Administrator.

The Water *Superintendent* will judge the adequacy of the test results and issue an authorization to connect.

City Water crews will provide shutdown and flushing as required.

END OF SECTION

SANITARY SEWER

1.0 GENERAL

1.6 Measurement and
Payment

Delete 1.6.1 and
replace

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

Delete 1.6.2 and
replace with

Payment for sanitary sewers includes asphalt & concrete saw cutting, disposal of pavement and concrete, trench excavation, shoring as required, disposal of surplus excavated material, removal and disposal of existing pipes, dewatering, removal and disposal of boulders not greater than 1 cubic meter, permanent plugs & caps, supply and installation of all pipe, fittings and related materials, tie-ins other than noted in Clause 1.6.7, bedding material, approved backfill material compacted in place, granular base, granular Subbase, cleaning and flushing, pressure testing, video inspection, all surface restoration under Section 31 23 01 – Sub-section 3.6 including top soil, sod, asphalt and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section. Payment does not include items that are part of the work and already paid in other Sections; and

Payment includes protecting the existing pavement outside of the utility trench. Repair and replacement of damaged asphalt outside of the utility trench will be at the Contractor's cost as determined by the Contract Administrator unless otherwise specified; and

Payment for restoration of driveways, curbs, and curb & gutter will be considered as incidental unless shown otherwise in the Schedule of Quantities.

Native excavated material shall only be used at the sole discretion and prior approval of the Contract Administrator as trench backfill for boulevard and outside of paved roadway area and shall have all cobbles greater than 150 mm diameter removed and disposed off-site and shall be granular in nature and free of organic materials. Native excavated material shall not be used as trench backfill where the moisture content does not permit compaction to the specified density. Where native excavated material is unacceptable for use as trench backfill, imported trench backfill shall be supplied, placed, and compacted to specified density and paid under 31 23 01s Subsection 1.10.9; and

Payment includes by-pass pumping (and dewatering) and include all pumps, labour and materials required to facilitate the work without any service disruption to property owners. Payment for the by-pass pumping (and dewatering) will be incidental unless shown otherwise in Schedule of Quantities.

Payment includes removal and disposal of roots, vegetation, organic matter and stumps that are located in the right of way and which fall within the work area. Trim small branches from trees or hedges as required and where necessary use an approved tree paint to repair damage to surviving vegetation where branches have been removed; and

Materials removed from within the right of way are the property of the private property owner. Materials removed within private property remain the property of the private property owner; and

	<p>Discard materials obtained from within the right of way and from adjacent private properties that are not suitable for reuse or not wanted by private owners at an approved dump site.</p> <p>Payment includes support of poles if necessary and manhole barrel preparation to accommodate the service connection.</p> <p>Measurement for sanitary main will be made horizontally along the ground from manhole centreline to manhole centreline after the work has been completed.</p>
<p>Delete 1.6.3 and replace with</p>	<p>Payment for new service connections includes 100mm SDR28 PVC pipe unless otherwise specified, shear band couplers, bends, increaser, pvc wye, stubs, caps, sanded stubs, stakes, manhole preparation for connection, Le-Ron inspection chamber c/w locking collar and red lid and all related fittings and components specified and/or shown on Standard Detail Drawings. Payment includes all applicable service pipes, materials and work described in 1.6.2.</p> <p>Measurement for service connection will be for each complete service installed, including the inspection chamber, length of service pipe installed and length of riser.</p> <p>Brooks Boxes with a steel lid are to be provided for inspection chambers located in driveways as necessary.</p> <p>Imported trench backfill shall not be used without the prior approval of the Contract Administrator. Payment for imported trench backfill will be made under Section 31 23 01 – Sub-section 1.10.9.</p>
<p>Add 1.6.4.1</p>	<p>Materials removed from within the right of way are the property of the private property owner. Materials removed within private property remain the property of the private property owner.</p> <p>Discard materials obtained from within the right of way and from adjacent private properties that are not suitable for reuse or not wanted by private owners at an approved dump site.</p> <p>Where possible and as agreed with the Contract Administrator, reuse topsoil obtained from within the right of way.</p> <p>Brooks Boxes with a steel lid are to be provided for inspection chambers located in driveways as necessary. Payment for the Brooks Boxes will be incidental.</p> <p>Payment includes support of poles if necessary and manhole barrel preparation to accommodate the service connection.</p> <p>Lump sum to include for all labour, materials, and equipment required to supply and install the work as specified and restore surface to its original conditions or better.</p>
<p>Add to Clause 1.6.7</p>	<p>Payment includes all applicable works, labor, couplers, material and equipment as described in Clause 1.6.2.</p>

2.0 PRODUCTS

**2.5 Granular Pipe
Bedding and
Surround Material**

Add 2.5.3

Pipe bedding shall be 19 mm clear crushed rock or as approved by the Contract Administrator. Surround material above the springline within the pipe zone may be Type 2.

3.0 EXECUTION

**3.8 Connections to
Existing Mainline
Pipes**

Delete 3.8.1 and
replace with

Connections with two sizes smaller or less to existing mainlines shall be made by removal of the section of the main and replacement with a manufactured PVC wye complete with stubs and double hub PVC couplings for PVC mains and approved shear band couplings for other mainline materials.

The contractor shall video inspect all connections to existing mains following completion of installation.

END OF SECTION

MANHOLES AND CATCHBASINS

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	Add to 1.5	Payment for all work performed under this section will be incidental to payment for the work described in other Sections.	
		Delete 1.5.1 and replace with the following	<p>Payment for manholes will be made by items or components installed for each type and size as shown on Contract Drawings and specified in the Schedule of Quantities and Prices.</p> <p>No payment will be made for excavation and all other associated work required to accommodate manhole in the new sewer system constructed under this Contract for which manhole forms a part.</p>	
		Delete 1.5.1.1 and replace with the following	<p>Payment for manhole includes supply and installation of pre bench gasketed base, lid, slab, donut ring, concrete frame, metal frame, cover and all as shown on Contract Drawing and as described on Standard Detail Drawing S1 and S2 for manholes except for riser. Payment includes base preparation, dewatering, all in-situ concrete work, manhole base preparation to accommodate new sewer installation c/w rubber resilient seat gasket, import backfill, granular subbase and base, compaction, all labor, material, equipment and necessary work for installing the manhole.</p>	
		Delete 1.5.1.2 and replace with the following	<p>Payment for manhole riser will be made by items or components installed for each type and size necessary and specified in the Schedule of Quantities and Prices.</p> <p>Payment for manhole riser sections includes supply and installation of standard and non standard heights required to complete manhole from specified invert to finishing level, and all necessary work as shown on Contract Drawing and as described on Standard Detail Drawing S1 and S2 for manholes. Payment includes aluminium or non slip ladder rung, all in-situ concrete work, import backfill, compaction, all labor, material, equipment and necessary work for installing the manhole; and</p> <p>Measurement will be made vertically for the length of the riser required from the top of the manhole base or tee section to reach the underside of concrete lid or slab.</p>	
		Delete 1.5.2 and replace with the following	<p>Catchbasin Installation will be defined as supplying and installing a new catch basin for each type specified and setting to the finished grade. Payment includes excavation, removal and disposal of existing catch basins and existing leads, and surplus excavated material, supply of all units, cast-in-place concrete, clear crushed and bedding, pipes, fittings and related materials together with all labour, materials and equipment required, all surface restoration including asphalt paving and associated curbing and top soil, sod</p>	
2.0	PRODUCTS	Delete 1.5.4 and replace with the following	<p>Payment for removal and/or abandoning of existing manholes, catch basins, and lawn basins, includes excavation, disposal off site of all components, disposal of all unsuitable material, import backfill, plugs,</p>	

caps, stubs, compaction and all necessary work as shown on Contract Drawing and as specified in the Schedule of Quantities and Prices.

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**

3.3 Manhole Installation

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.

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.

**3.5 Catchbasin
Installation**

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.

Delete 3.5.1 and
replace with the
following

Install catch basins as shown on Coquitlam Standard Detail Drawings COQ-S11A, COQ-S11B and Standard Detail Drawing S11, to general standards and installation procedures described under 3.3 of this Section.

END OF SECTION

Appendix A-

Traffic Management

Detail Specifications

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|-----------------------------|---|
| 1.0 GENERAL | |
| | .1 This Traffic Management detail specification refers to the Contractor's specific plans to identify project traffic risks affecting the <i>Work</i> , provide Traffic Control Plans, and to implement the traffic control for the safe passage of vehicles and pedestrian through the work zone. |
| 1.1 Related Works | .1 Traffic Regulation MMCD Section 01 55 00S. |
| 1.2 References | .1 WorkSafe BC, Occupational Health and Safety (OHS) Regulation, Section 18 – Traffic Control.

.2 B.C. Ministry of Transportation (MOT) Traffic Control Manual for Work on Roadways. |
| 1.3 Project Requirements | .1 Hours of Work and Traffic Restrictions for this project are identified in APPENDIX 1 of this document.
A Road and Sidewalk Closure Permit form application must be submitted to City's Traffic Operation Division 5 working days prior to start of work.

.2 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 2 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 www.coquitlam.ca/closure . |
| 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 |

These supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents (Platinum), Volume II, 2009.

- .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.

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| 2.2 | Incident Management and Reporting | <p>.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.</p> <p>.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.</p> |
| 2.3 | Traffic Control Plans | <p>.1 The Contractor shall designate a qualified Traffic Control Supervisor for the works, per the requirements of WCB regulations Section 18.</p> <p style="padding-left: 40px;">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.</p> <p>.2 The Contractor shall prepare weekly the anticipated traffic control activities, locations, and durations for the upcoming week.</p> <p>.3 Permissible delays shall only be considered outside Peak Hours. Permissible delays are categorized as follows:</p> <ul style="list-style-type: none">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. <p>.4 The Contractor is responsible for ensuring that the flow of traffic is unimpeded by construction-related activities.</p> |

3.0 EXECUTION

- | | | |
|-----|----------------------|---|
| 3.1 | Traffic Control Plan | <p>.1 A copy of the approved <u>current</u> Traffic Plan must be held on site by both the Site Superintendent as well as the person/company responsible for the traffic control implementation.</p> <p>.2 Failure to produce a valid approved Traffic Plan on site, or having work not follow the Traffic Control Plan will result in immediate</p> |
|-----|----------------------|---|

These supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents (Platinum), Volume II, 2009.

shut-down of the work. The Contractor will be required to safely restore facility conditions to allow traffic flow at their expense. The Contractor must take all steps to acquire an approved Traffic Control Plan before work can re-start on site. No claim will be accepted by the Owner for costs associated with this work shut-down.

3.2 Road and Sidewalk
Closure Permits

- .1 The Contractor must have, on-site, a copy of an approved Road and Sidewalk Closure Permit valid for the work being done. Failure to produce a valid Road and Sidewalk Closure Permit on-site will result in shut-down of the work. Failure to comply on what is stated on the approved permit will result in shut-down of the work. The Contractor will be required to safely restore facility conditions to allow traffic flow at their expense. The Contractor must take all steps to acquire a Road and Sidewalk Closure Permit before work can re-start on site. No claim will be accepted by the Owner for costs associated with this work shut-down.

3.3 Traffic Control
Personnel
& Equipment

- .1 The Contractor shall supply all necessary traffic control devices required to perform traffic control services for the project. Signs and traffic control devices not applying to existing conditions shall be removed. Where operations are carried out in stages, only those traffic control devices that apply to the current stage are to be left in place.
- .2 There must be sufficient Traffic Control Persons (TCPs) on site to appropriately and safely direct traffic in all sections of the Work.

3.4 Signage

- .1 Supply, installation, maintenance and removal of all works-related signs shall be the responsibility of the Contractor. The location and type of each sign shall be indicated on the approved Traffic Control Plan, for each stage of the works.

Traffic control signs and devices must be positioned and used as specified in the Traffic Control Plan and signs and devices must be located so as to allow traffic to move by or through the work area in a controlled manner and, if necessary, to come to a controlled stop with due regard for the prevailing weather and road conditions.

Signs shall be checked daily for legibility, damage, suitability and location. Signs and delineators shall be cleaned as frequently as necessary to ensure full legibility and reflectance.

3.5 Detours

- .1 Any proposed detours must be approved by the Contract Administrator and conducted in accordance with the approved Traffic Plan and the Traffic Control Manual for Work on Roadways.

- | | | | |
|-----|--------------------------------------|----|---|
| 3.6 | Abrupt Changes in Surface Elevations | .1 | The Contractor shall minimize any abrupt changes in roadway elevation left exposed to traffic during both working and non-working hours.

A wedge of asphalt must be used as a transition to vertical differences in travelled areas and have a slope of 4:1 or less. |
| 3.7 | Cyclist and Pedestrian Access | .1 | The Contractor shall make provision for pedestrians, wheel chairs and bicycles to have safe access across the work zone at all times. If this cannot be readily accommodated, then acceptable detours and appropriate signs shall be provided. |
| 3.8 | Temporary Pavement Markings | .1 | The Contractor shall be responsible for the application and removal of all temporary pavement markings and reflective devices.

All temporary markings must be removed after installation of permanent markings. |

4.0 TRAFFIC RESTRICTIONS

- | | | | |
|-----|-----------------------------------|----|--|
| 4.1 | Road and Sidewalk Closure Permits | .1 | See APPENDIX 1 - CONTRACT HOURS OF WORK and TRAFFIC RESTRICTIONS |
| | | .2 | A City of Coquitlam Road and Sidewalk Closure Permit is required for each instance of closure and will be valid for a maximum period of one (1) week and, if still necessary, re-submittal of a Road and Sidewalk Closure Request is required.

A copy of the approved Road and Sidewalk Closure and Lane Closure Permit must be held on site by both the Site Superintendent and the person/company responsible for the traffic control implementation. |
| | | .3 | Detours will only be permitted as approved by the Contract Administrator and must have a complete Traffic Control Plan indicating detour route, signing, and duration. Detours will not be allowed without sufficient lead time for commercial and retail operation to react appropriately to detour information provided to them. |

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, City facilities and residences during construction activities. |
| 5.3 Work stoppage due to traffic | .1 The City will not control or direct traffic control activities of the Contractor, but may require an immediate stop to any work where, in the sole opinion of the Contract Administrator, the provided traffic management plan is ineffective or creating unreasonable delays. |
| 5.4 Construction Activity and Signage | .1 The Contractor will be responsible to place other construction information signs as required to inform the public of construction activities, and ensure safe travel through the work site. |
| 5.5 Construction Zone Information Signs | <p>.1 The Contractor is required to provide, one week prior to start of work, stationary signs at intersections, one in each direction, to inform traffic of existing and anticipated conditions at entry points of the street to be worked on, locations for these signs will be provided by the Contract Administrator.</p> <p>Ensure that signs and locations are addressed in the Traffic Management Plan. All signs are to be removed at the end of the construction period.</p> <p>(exact locations to be determined on site by Contract Administrator)</p> <p>Ensure that signs and locations are addressed in the Traffic Management Plan. All signs are to be removed at the end of the construction period.</p> |

APPENDIX 1
CONTRACT HOURS OF WORK and TRAFFIC RESTRICTIONS

1.0	GENERAL	
1.1	Contract Number	87422
1.2	Contract Name	Foster Pump Station Upgrades
1.3	Contract Limits	As shown on the Contract Drawings
2.0	ROAD SECTION	
2.1	Foster Avenue/Winslow Avenue	<ol style="list-style-type: none">1. Minimum of Single Lane Traffic in each direction must be accommodated at all times during construction, loading/unloading of equipment etc. unless otherwise authorized by the Contract Administrator.2. Contractor shall make adequate arrangements to accommodate visitors to the Tennis Facility and Dogwood Pavilion during construction. Parking areas for these facilities should not be affected on account of construction.3. The work should be scheduled such that garbage trucks can pass for garbage collection. In case of any access problem the Contractor may be required to move garbage bins.
3.0	HOURS OF WORK	
3.1	Allowable Hours of Work	<ol style="list-style-type: none">.1 Unless there are other contract restrictions for work times, work can be performed during the normal weekday working hours of 07:00 hrs to 19:00 hrs
		<ol style="list-style-type: none">.2 Work is allowable on Saturdays but is restricted to a 09:00 hrs to 18:00 hrs
		<ol style="list-style-type: none">.3 No work is allowed on Sundays or statutory holidays without specific permission arranged through the Contract Administrator.
4.0	OPERATIONS	
4.1	Truck Routes	<ol style="list-style-type: none">.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.

These supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents (Platinum), Volume II, 2009.

APPENDIX 2



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: \$75.00 (Effective February 1, 2019)~~

~~Payment Methods: 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

- | | | |
|---|--|--|
| <input type="checkbox"/> Permit Fee | <input type="checkbox"/> Prime Contractor Letter | <input type="checkbox"/> Certificate of Insurance |
| <input type="checkbox"/> Traffic Control Plan | <input type="checkbox"/> Impact to bus service | <input type="checkbox"/> Impact garbage and recycling collection |

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

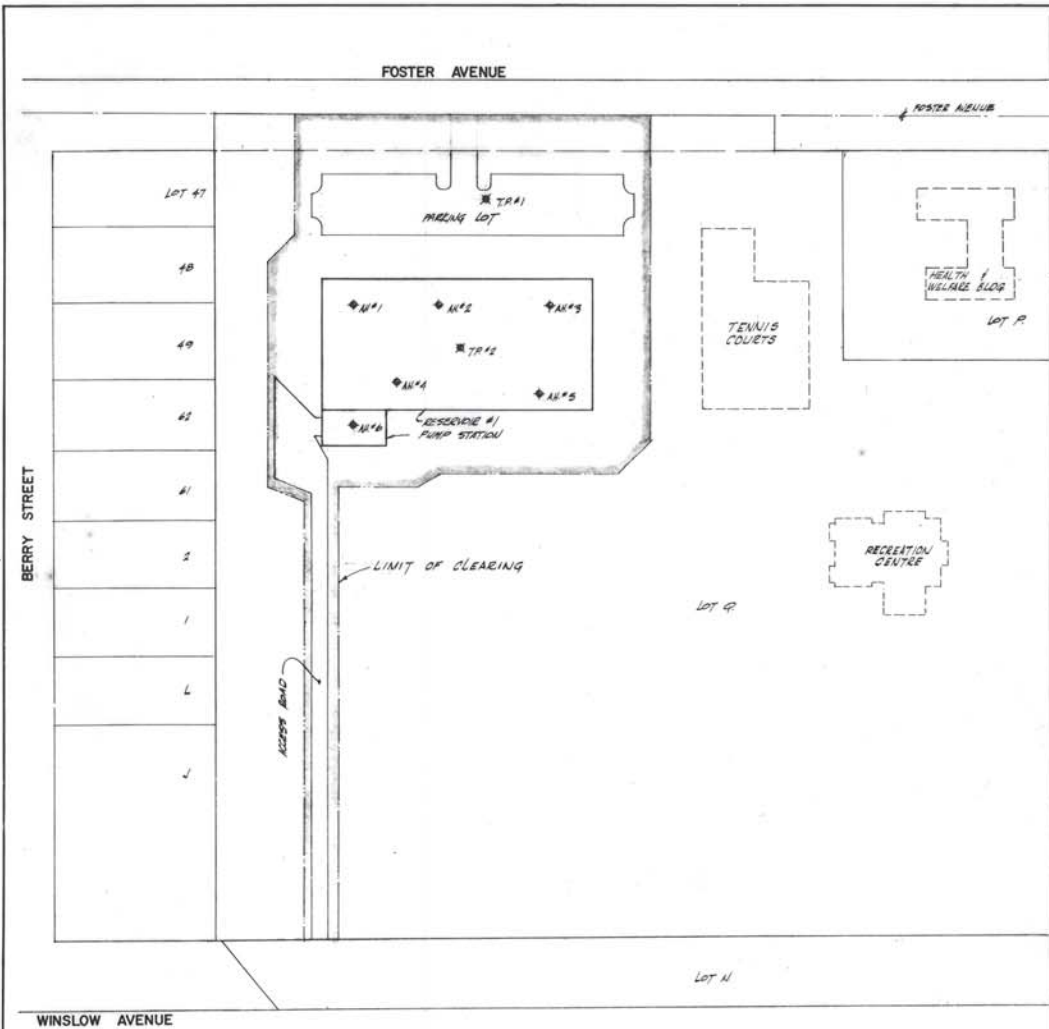
☐ Request is approved with the following change(s): _____

☐ Request is approved as submitted

Date

Traffic Technologist or Designate

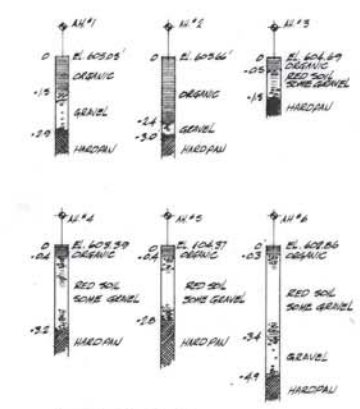
Appendix B - As-Built Record Drawings



STOCKILL SITE



LOCATION PLAN



• AUGER HOLE BY J.E.S.L.
• TEST PIT BY GOLDER-SCHWABER

AUGER HOLE DATA

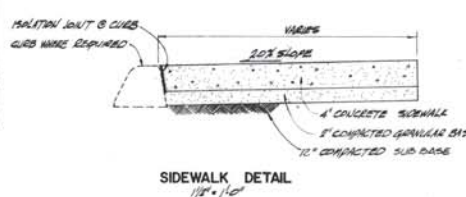
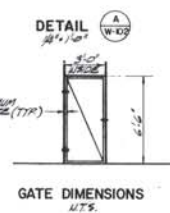
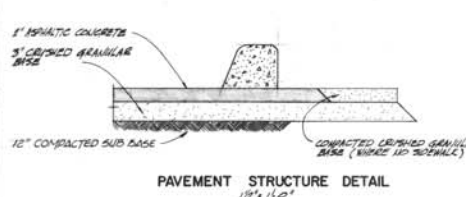
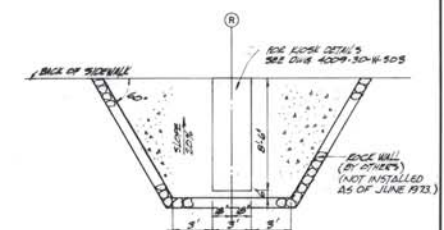
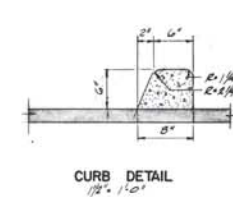
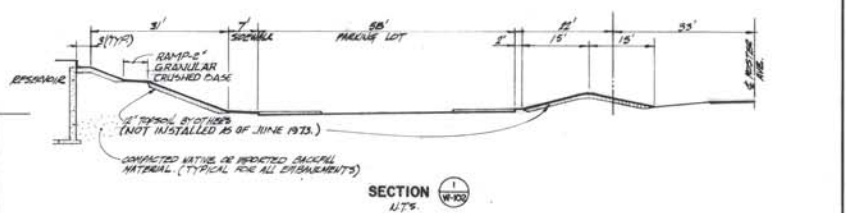
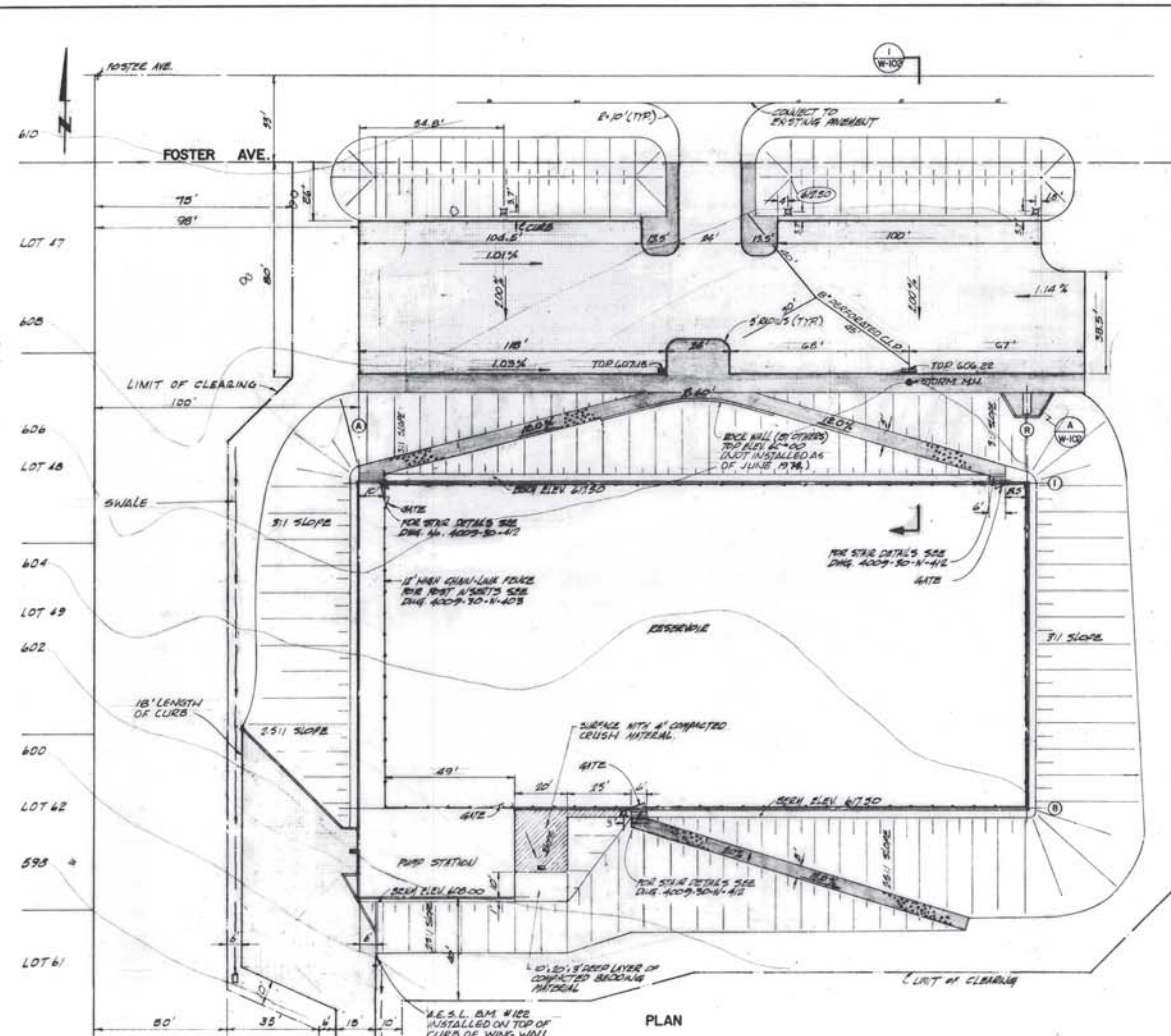
INDEX OF DRAWINGS

REVISED DRAWING NO.	TITLE
1	4009-30-W-101 KEY PLAN
2	4009-30-W-102 SITE DETAILS AND FINISHES
3	4009-30-W-103 UNDEGROUND UTILITIES
4	4009-30-W-104 PLAN AND PROFILE ACCESS ROAD
5	4009-30-W-105 PUMP STATION PLAN, PLAN
6	4009-30-W-106 PUMP STATION PIPING, SECTIONS
7	4009-30-W-107 PUMP STATION PIPING, SECTIONS AND DETAILS
8	4009-30-W-108 PUMP STATION ELECTRICALS
9	4009-30-W-109 RESERVOIR FOUNDATION PLAN & SECTION, CONC.
10	4009-30-W-110 RESERVOIR BODY PLAN & SECTION, CONCRETE
11	4009-30-W-111 RESERVOIR SECTIONS & DETAILS, CONCRETE
12	4009-30-W-112 REPAIRS TO THE PLAN & SECTION, CONCRETE
13	4009-30-W-113 PUMP STATION FOUNDATION PLAN & SECTION, ONE
14	4009-30-W-114 PUMP STATION BODY PLAN & SECTION, ONE
15	4009-30-W-115 PUMP STATION SECTIONS, CONCRETE
16	4009-30-W-116 PUMP STATION RES. METALS DETAILS & SECTIONS
17	4009-30-W-117 BODY RESERVOIR PLAN
18	4009-30-W-118 BODY RESERVOIR DETAILS
19	4009-30-W-119 PUMP STATION SECTIONS & DETAILS, CONCRETE
20	4009-30-W-120 PUMP STATION ELECTRICALS AND DETAILS, ONE
21	4009-30-W-121 LIGHTING & MOUNTING LAYOUT
22	4009-30-W-122 LIGHTING & MOUNTING LAYOUT & PAUSE SIGNAGE
23	4009-30-W-123 FLOOD LIGHTING LAYOUT

W-610-1

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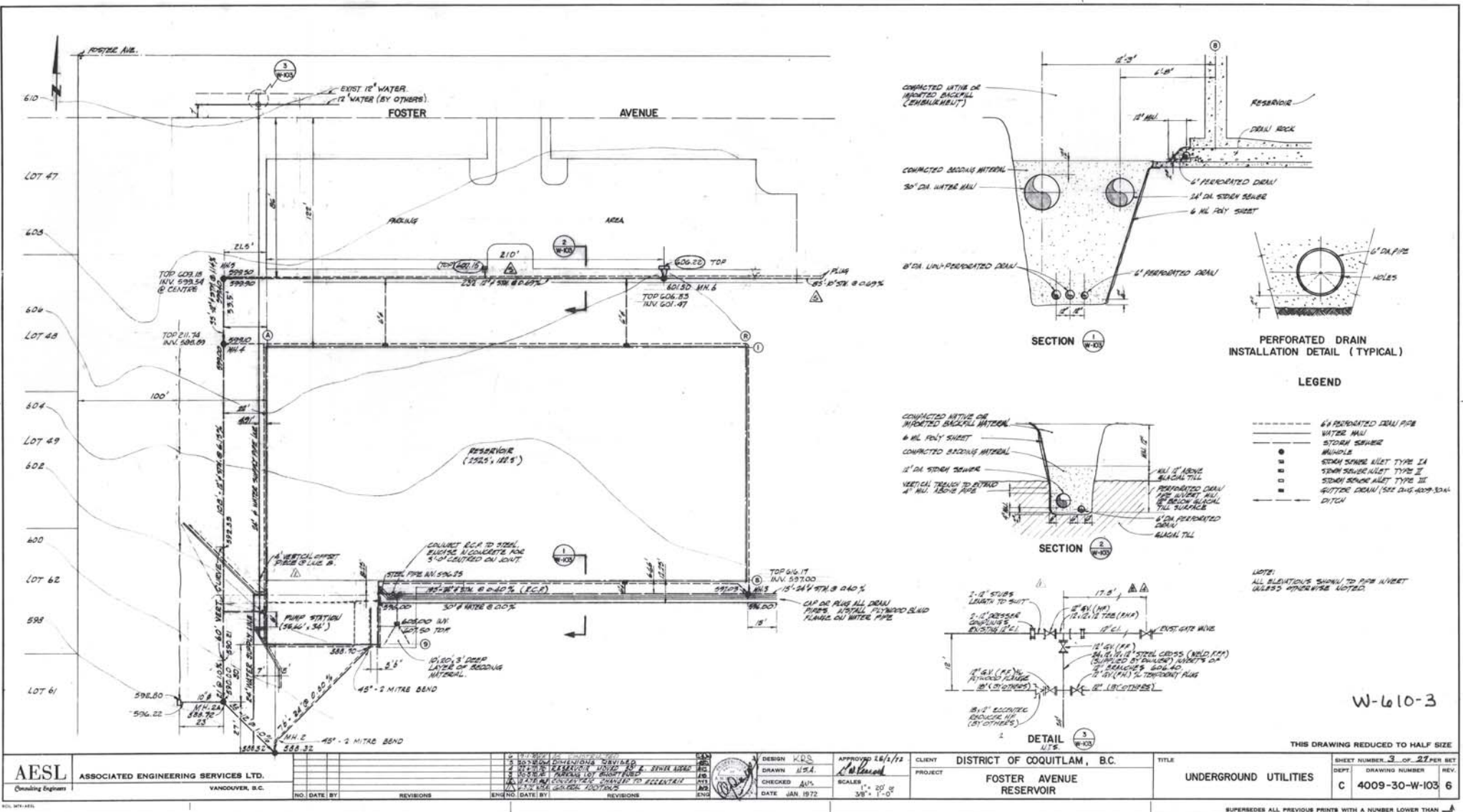
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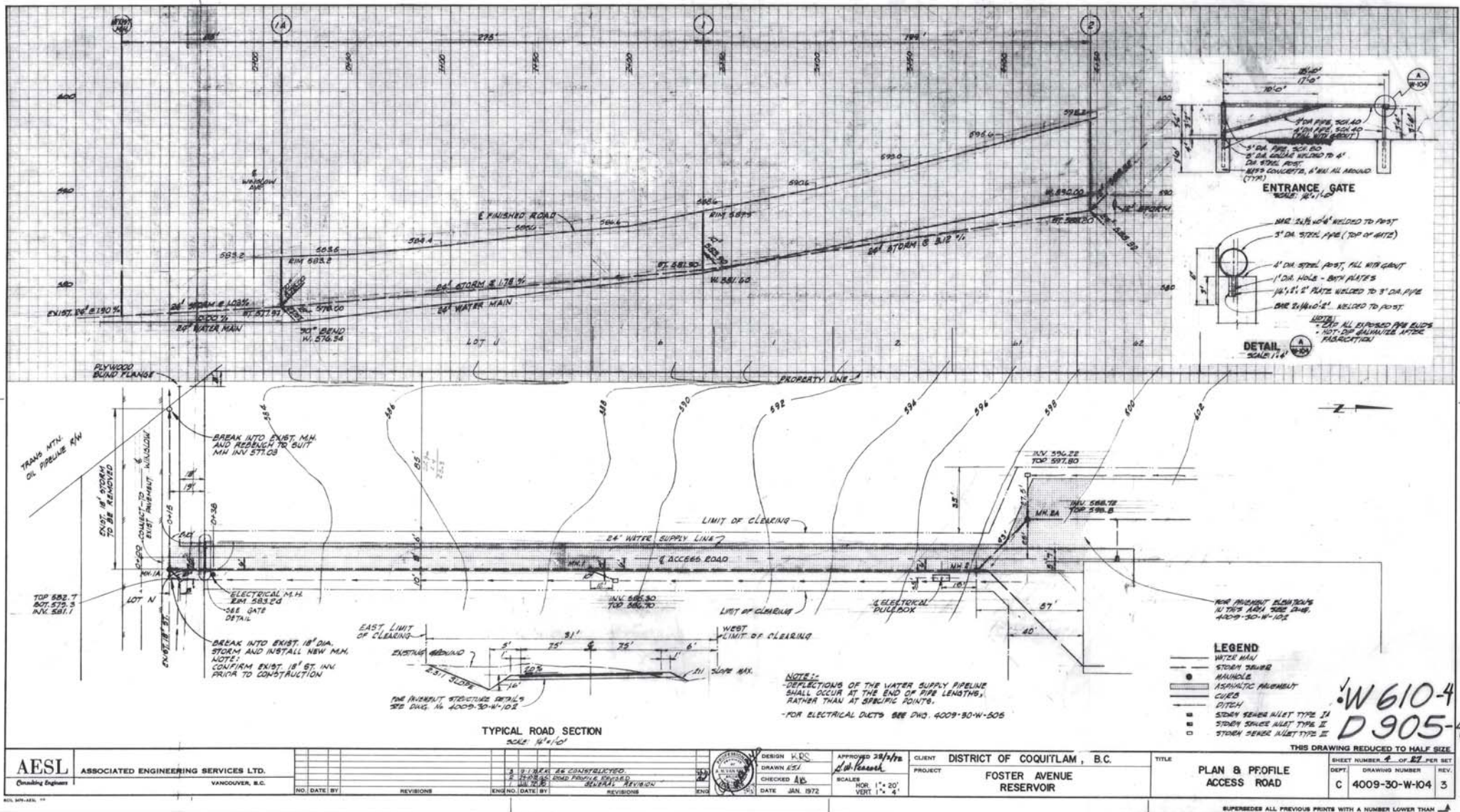


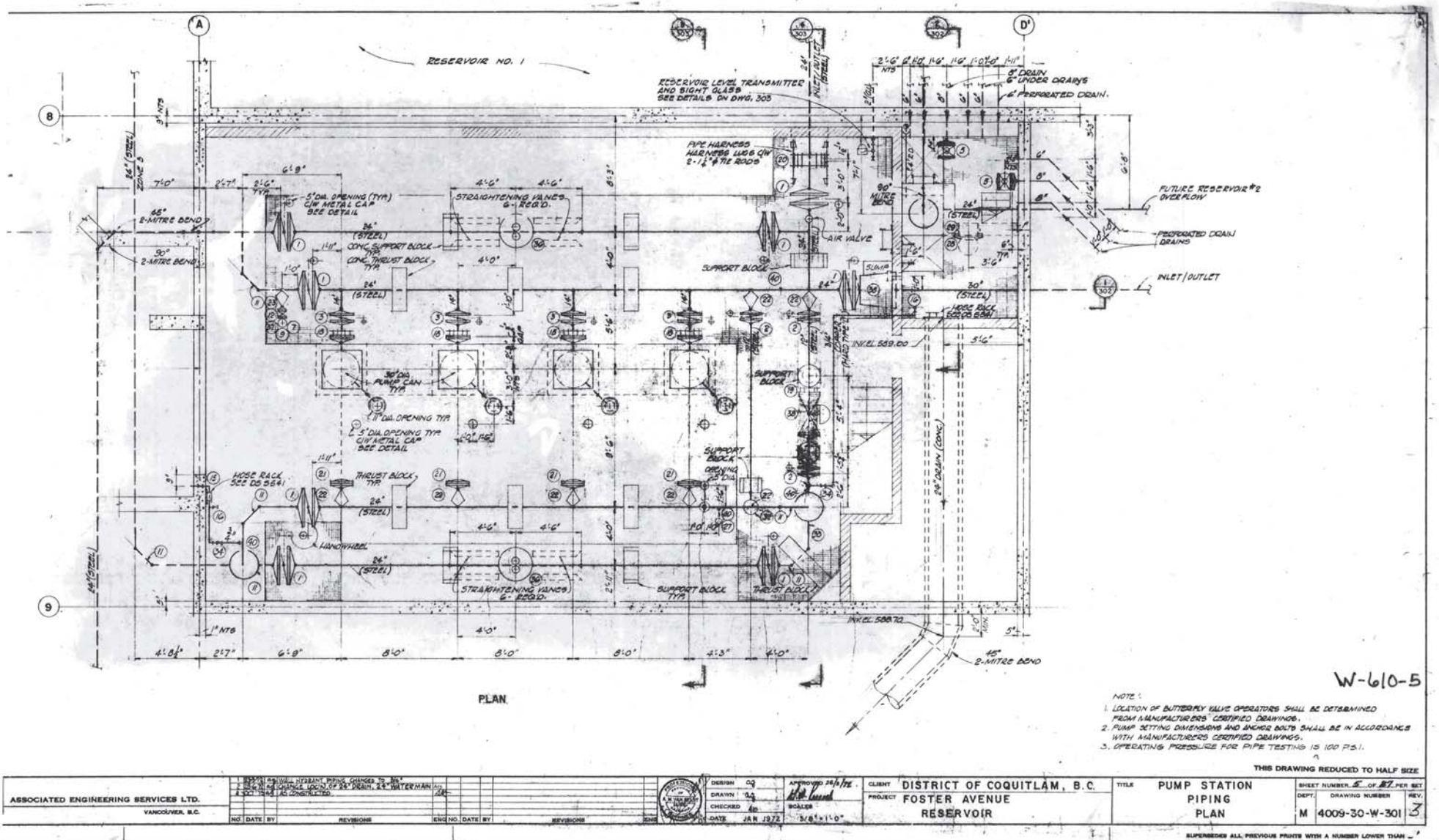
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- GRANULAR BASE RAMP
 - CONCRETE SIDEWALK
 - CONCRETE PAVEMENT
 - CURB
 - STONE DRAINAGE LIFT TYPE I
 - STONE DRAINAGE LIFT TYPE II
 - STONE DRAINAGE LIFT TYPE III
 - DESIGN ELEVATION
 - EXISTING ELEVATION
 - CHAIN-LINK FENCE
- NOTES**
- ELEVATIONS SHOWN TO FINISHED GRADE
 - CONSTRUCT FASBANKMENTS TO 1' BELOW FINISHED GRADE
 - ELEVATIONS ON PAVED AREAS SHOWN TO TOP OF PAVEMENT

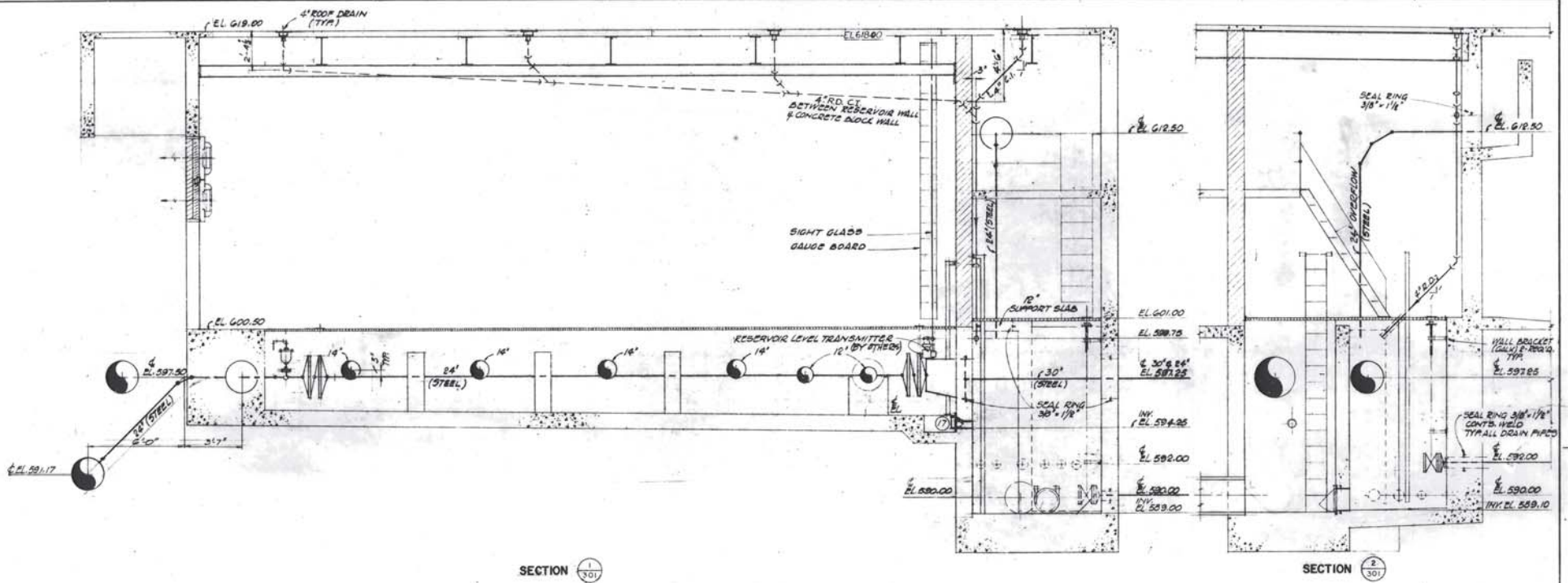
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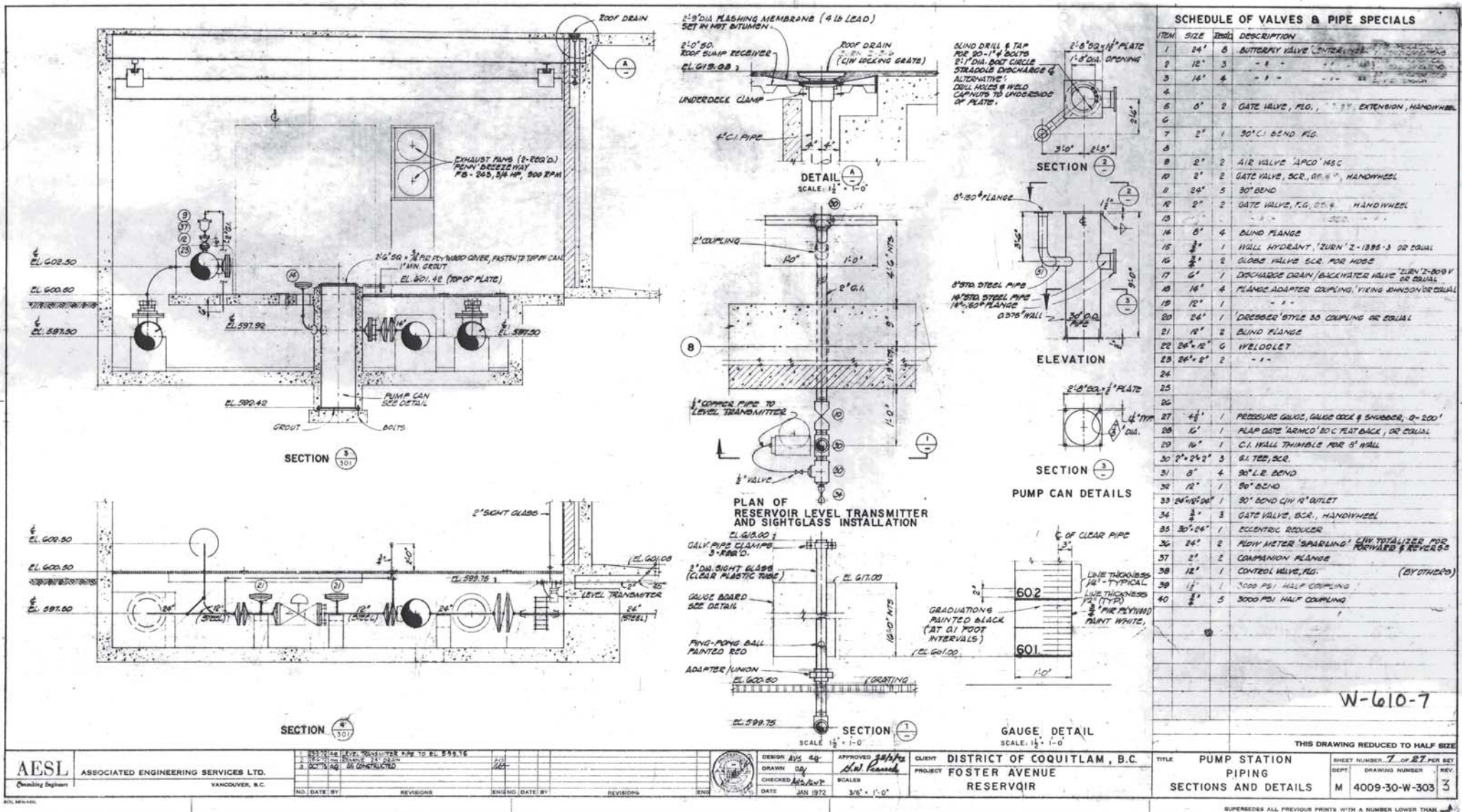


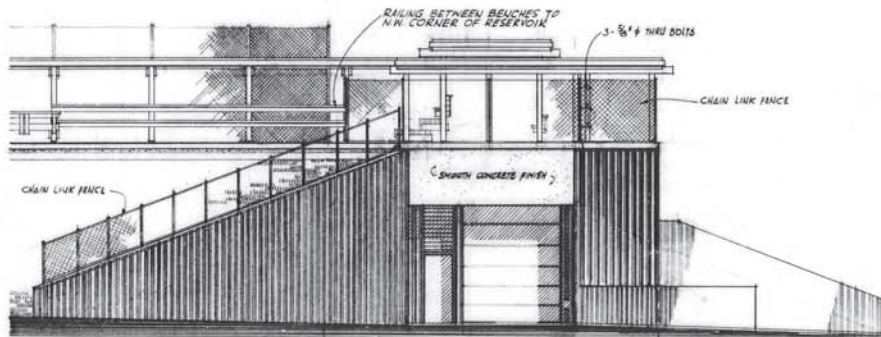




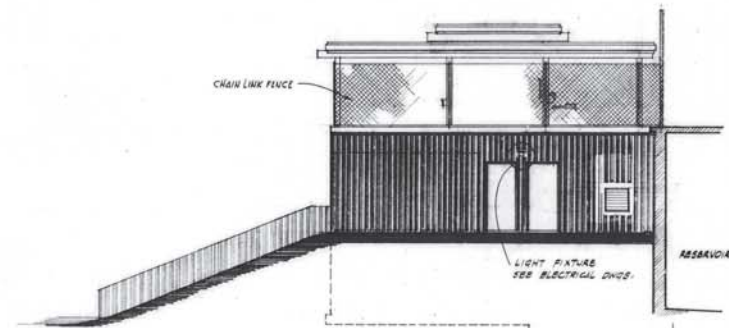
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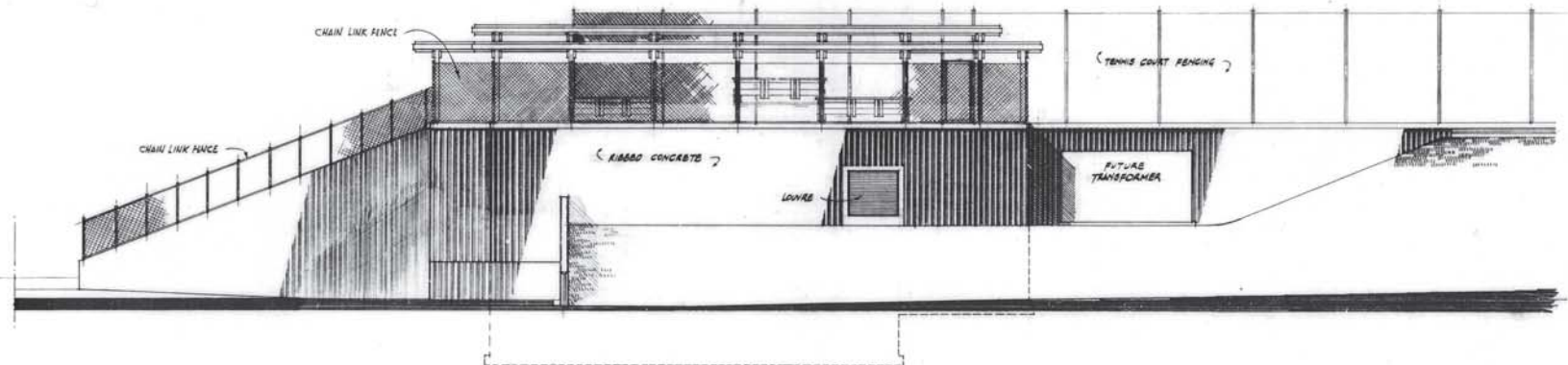




WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION

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Consulting Engineers

ASSOCIATED ENGINEERING SERVICES LTD.
VANCOUVER, B.C.

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DATE FEB. 1972

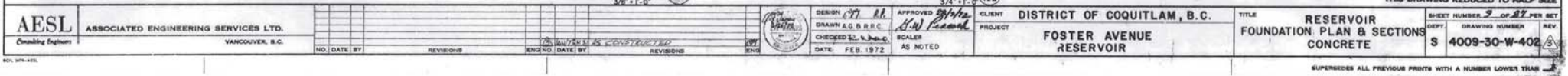
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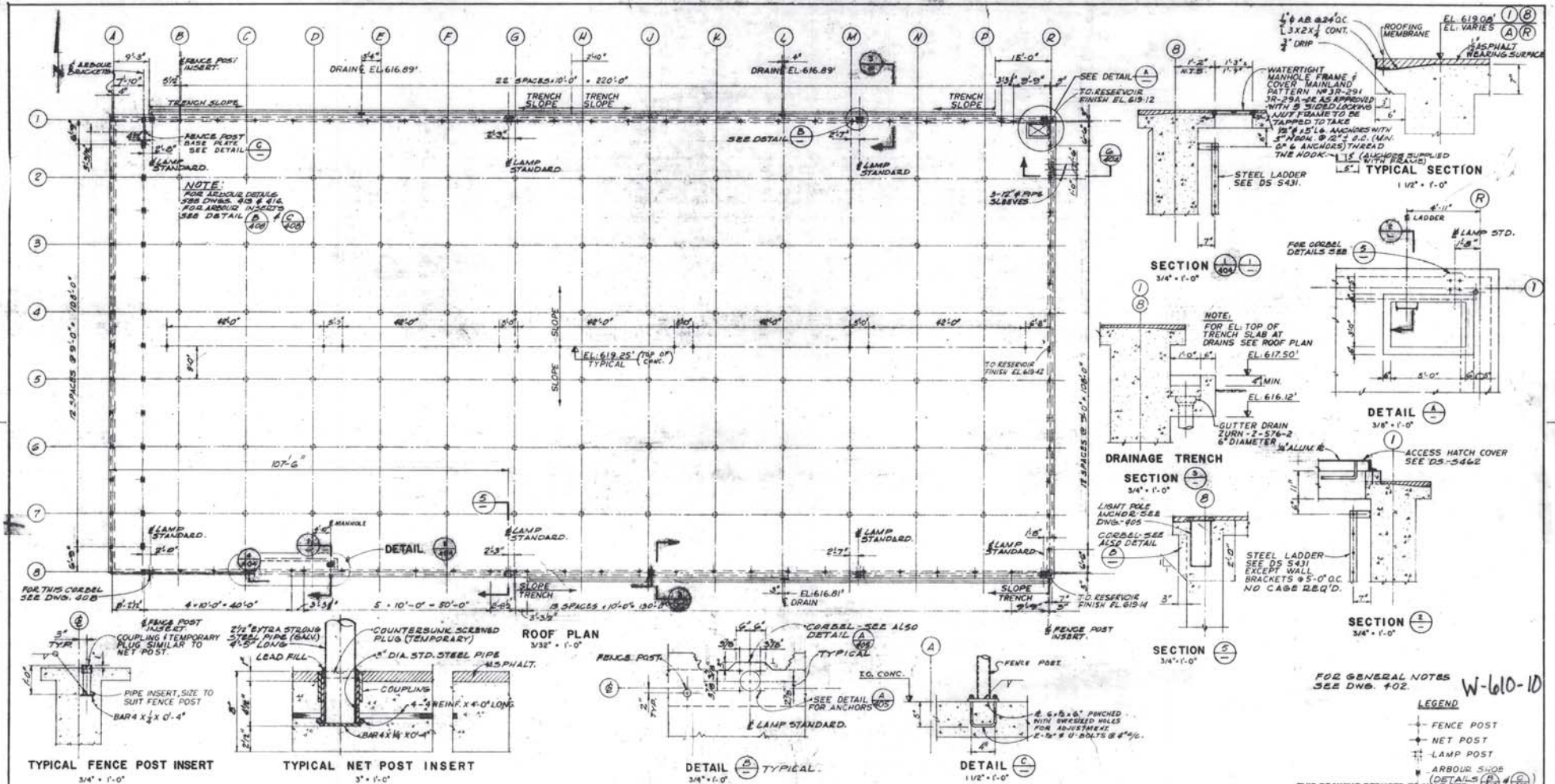
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PROJECT FOSTER AVENUE RESERVOIR

TITLE PUMP STATION ELEVATIONS

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ASSOCIATED ENGINEERING SERVICES LTD.
Consulting Engineers
VANCOUVER, B.C.

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DATE FEB 1972

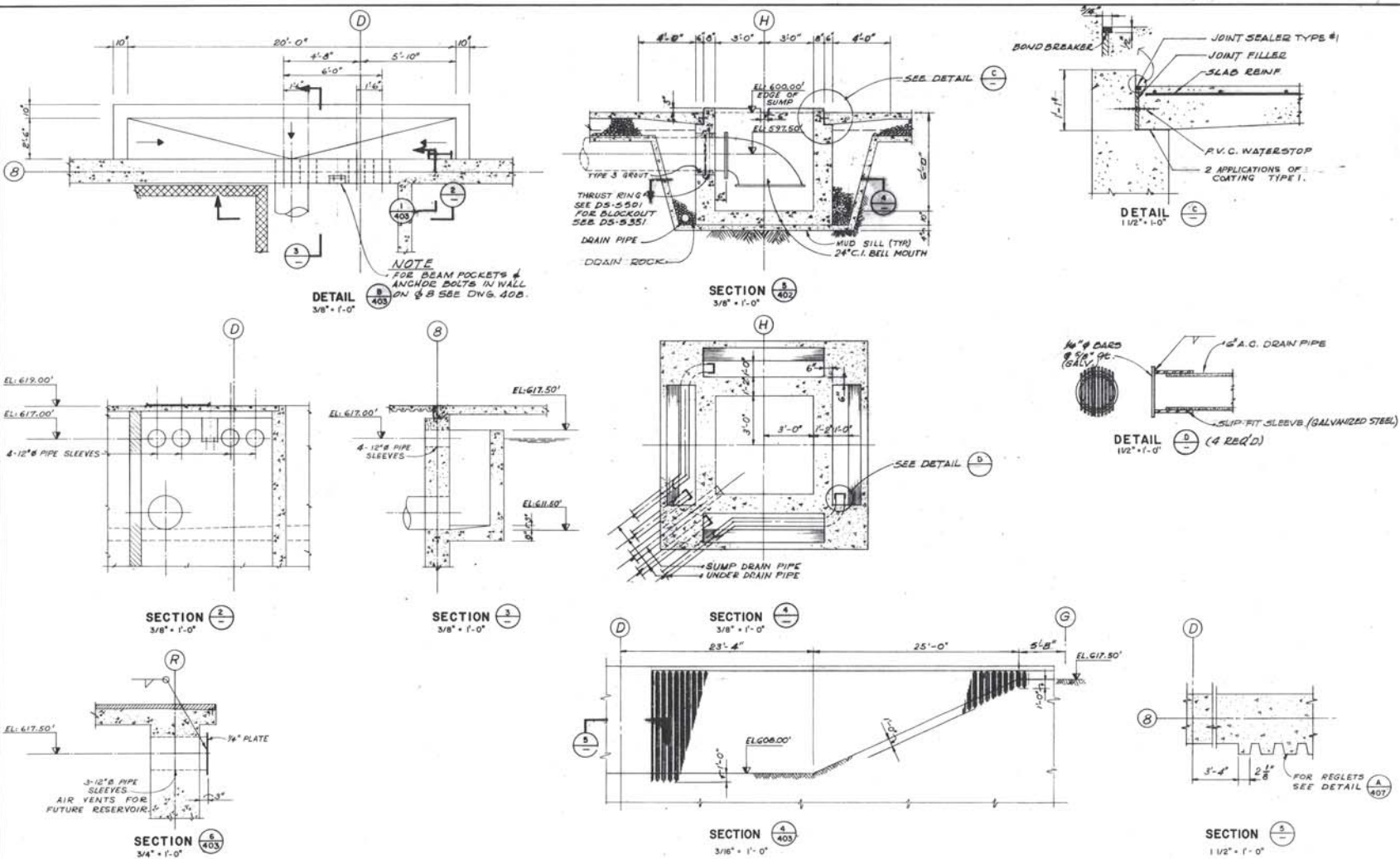
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PROJECT
AS NOTED

DISTRICT OF COQUITLAM, B.C.
FOSTER AVENUE
RESERVOIR

TITLE
RESERVOIR
PLAN & DETAILS
CONCRETE

SHEET NUMBER 10 OF 23 PER SET
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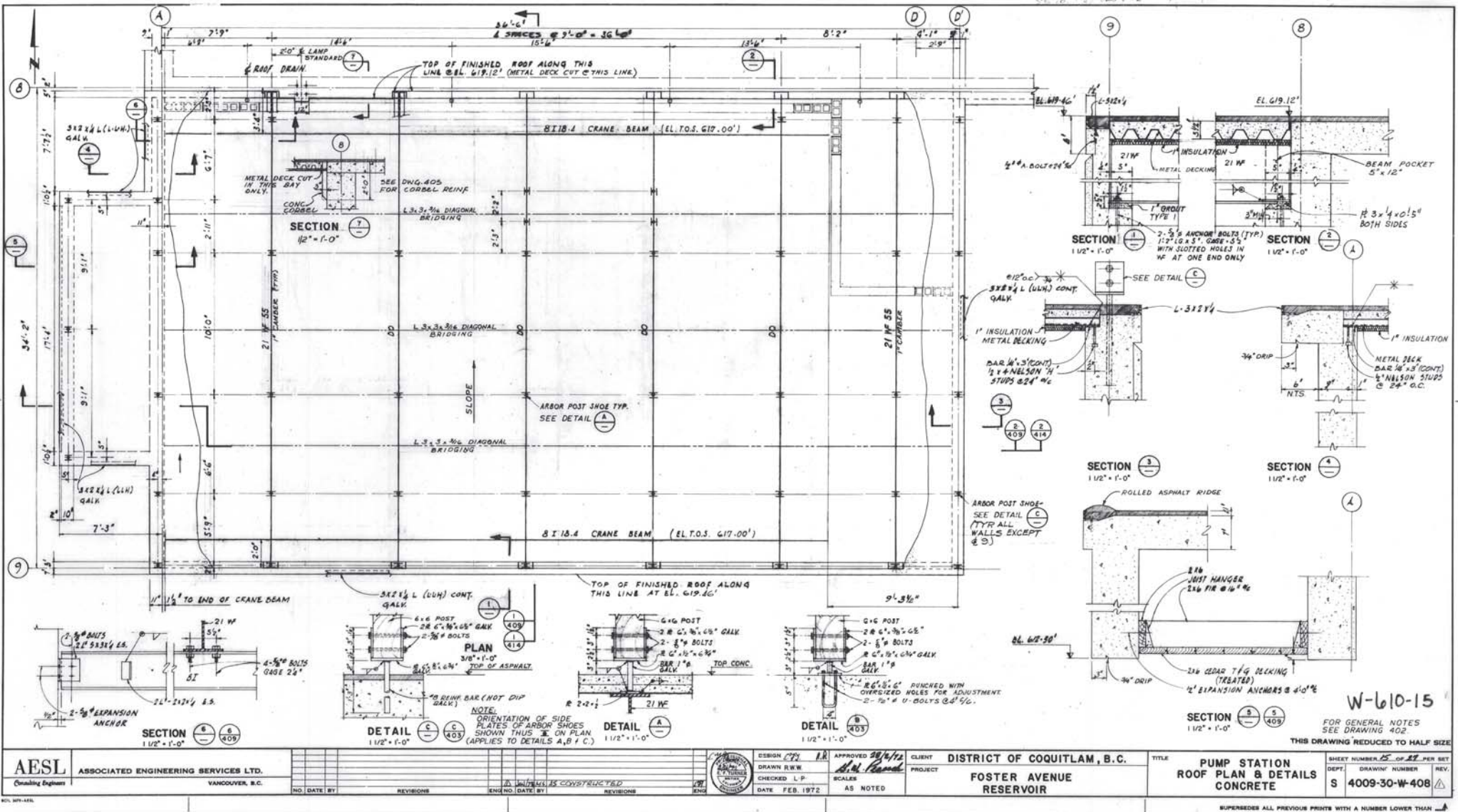
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SEE DNG. 402.

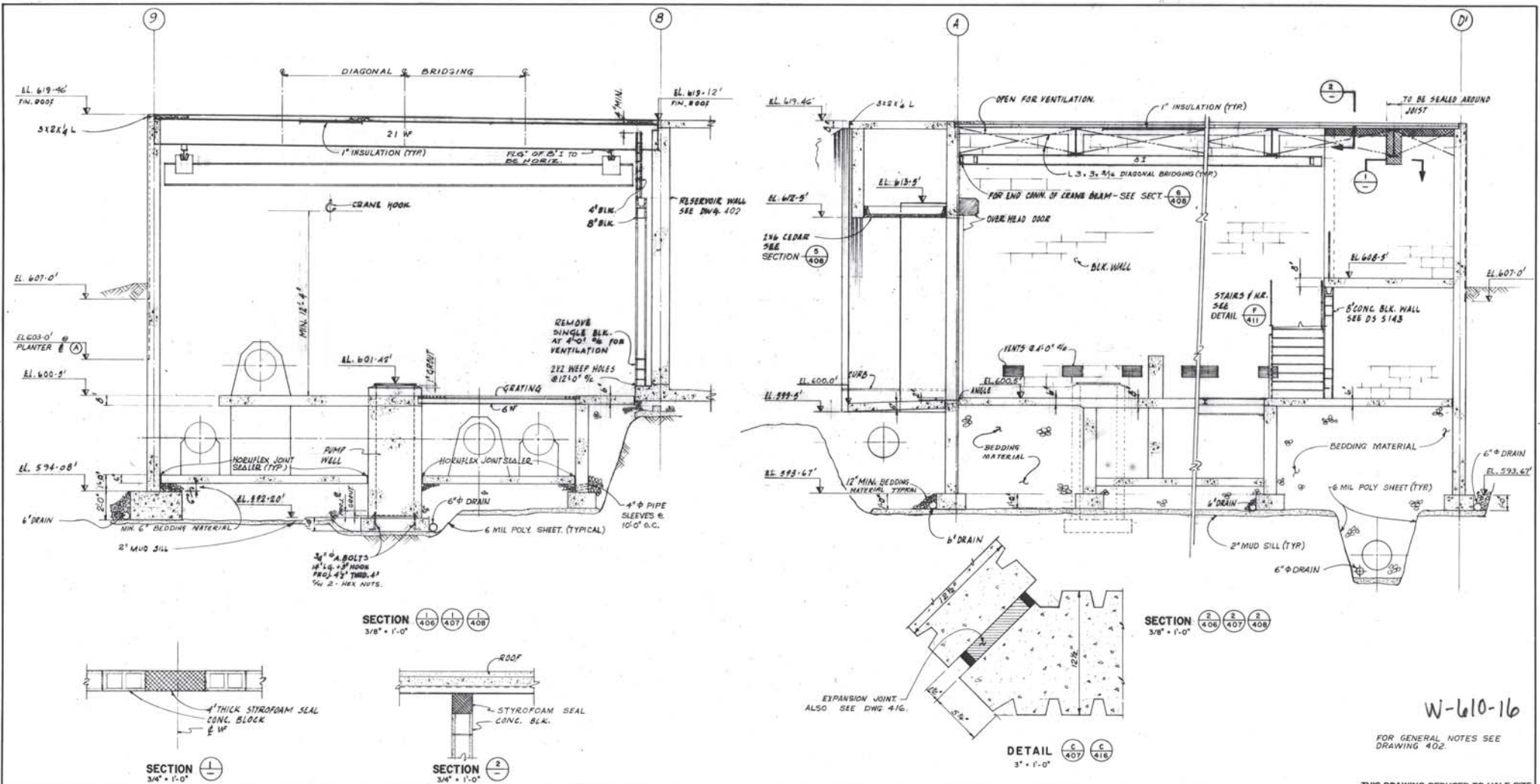
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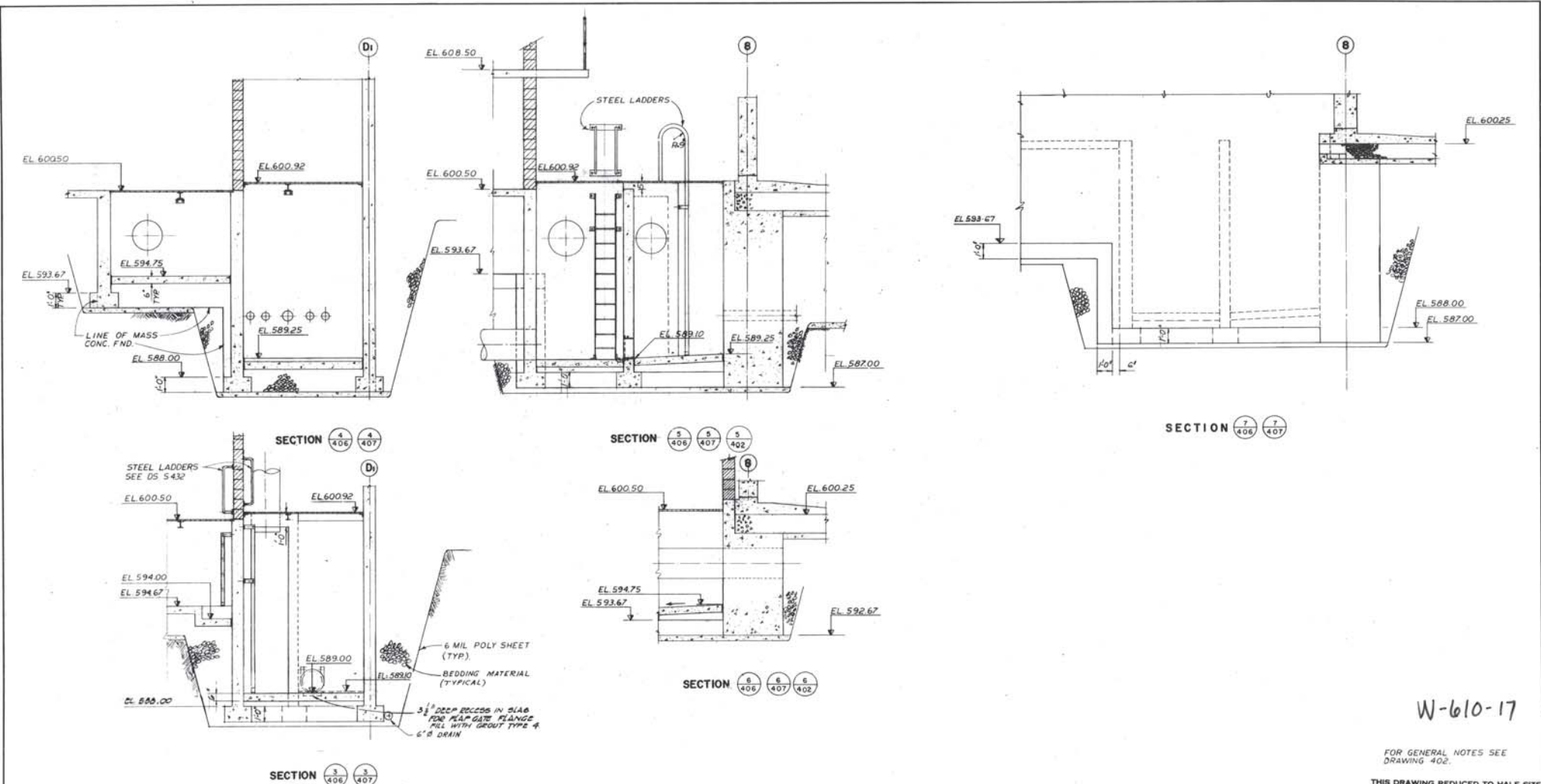
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FOR GENERAL NOTES SEE DRAWING 402.

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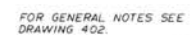
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FOR GENERAL NOTES SEE
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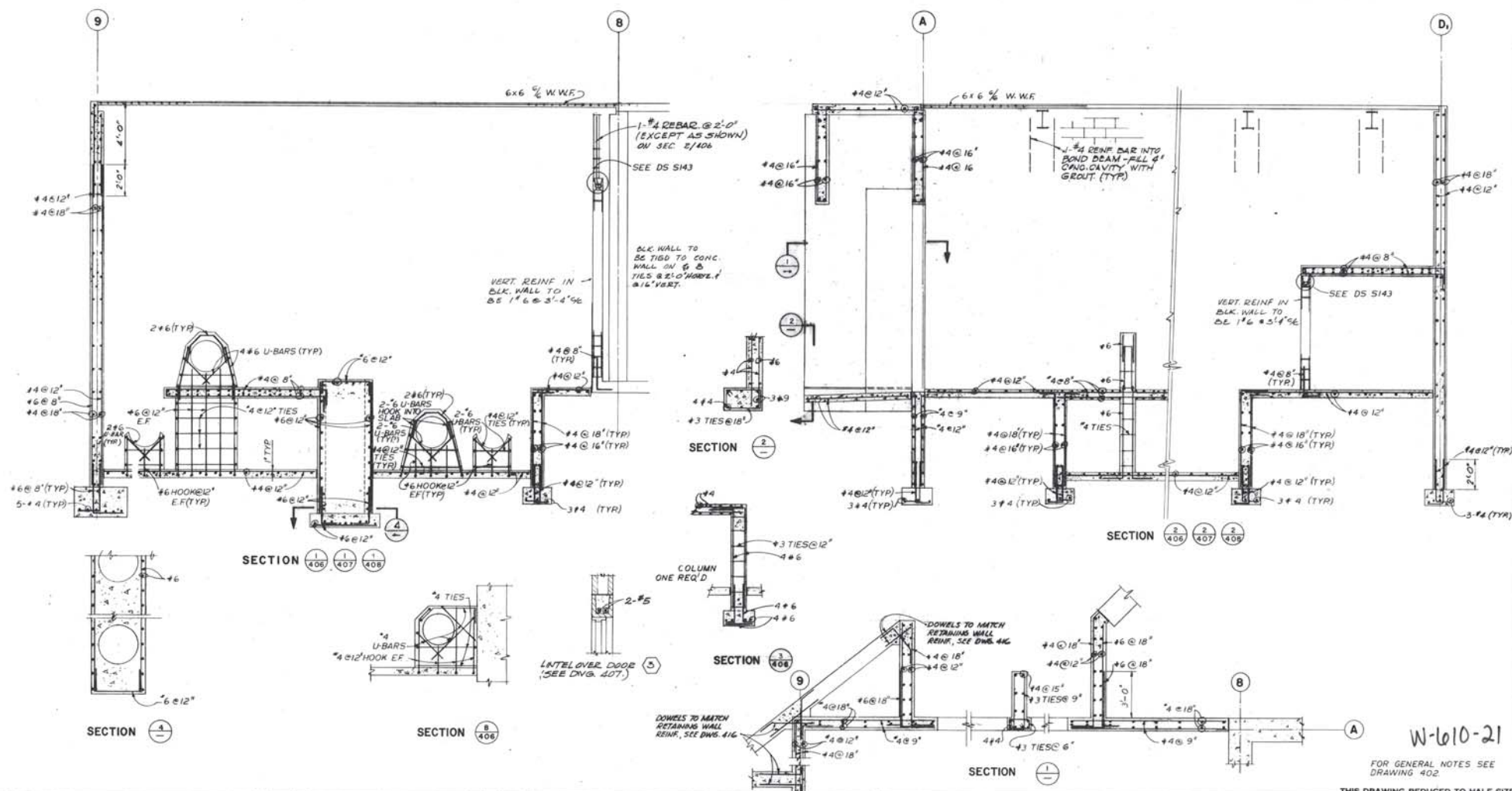
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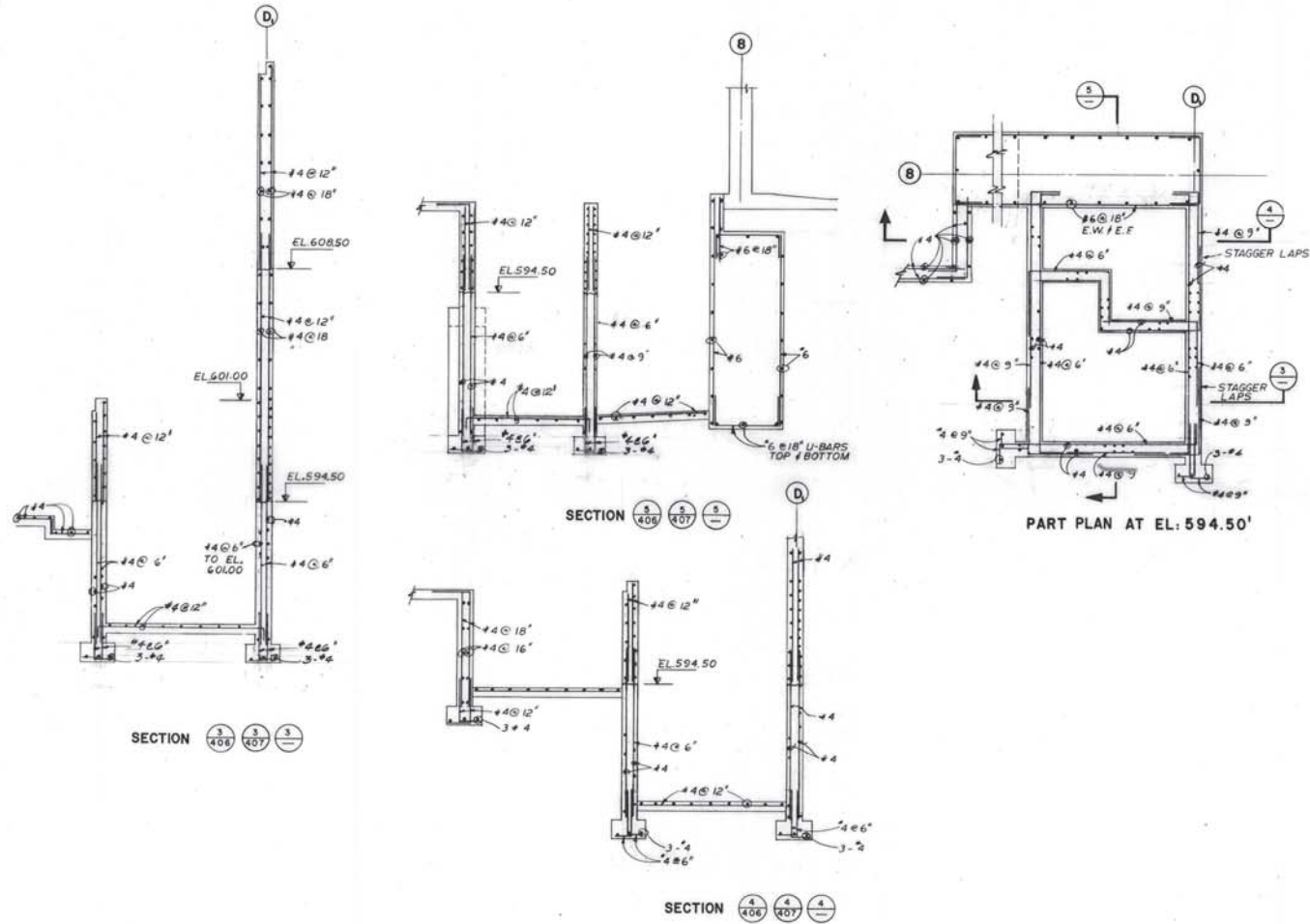
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FOR GENERAL NOTES SEE
DRAWING 402.

THIS DRAWING REDUCED TO HALF SIZE

	DESIGN BY <i>R.R.</i>	APPROVED BY <i>W.H.H.</i>	CLIENT	DISTRICT OF COQUITLAM, B.C.	TITLE	PUMP STATION SECTIONS REINFORCEMENT	THIS DRAWING REDUCED TO HALF SIZE	SHEET NUMBER <i>21</i> OF <i>22</i> PER SET	DRIVING NUMBER	REV
	CHECKED <i>L.P.</i>	DATE <i>FEB. 1972</i>	PROJECT	FOSTER AVENUE RESERVOIR	SCALES	<i>3/8" = 1'-0"</i>				
ASSOCIATED ENGINEERING SERVICES LTD. VANCOUVER, B.C.		NO. DATE BY REVISIONS		ENGINEER'S CONTRACT NO.		S		4009-30-W-414		

SUPERSEDES ALL PREVIOUS PRINTS WITH A NUMBER LOWER THAN _____



FOR GENERAL NOTES SEE
DRAWING 402.

W 610-22

THIS DRAWING REDUCED TO HALF SIZE

AESL

ASSOCIATED ENGINEERING SERVICES LTD.

VANCOUVER, B.C.

NO. DATE BY

REVISIONS

ENGR. DATE BY

REVISIONS



DESIGN F.J.K. 54
DRAWN F.J.K. 54
CHECKED L.P.
DATE FEB. 1972

APPROVED *[Signature]*
Scales 3/8" = 1'-0"

CLIENT PROJECT

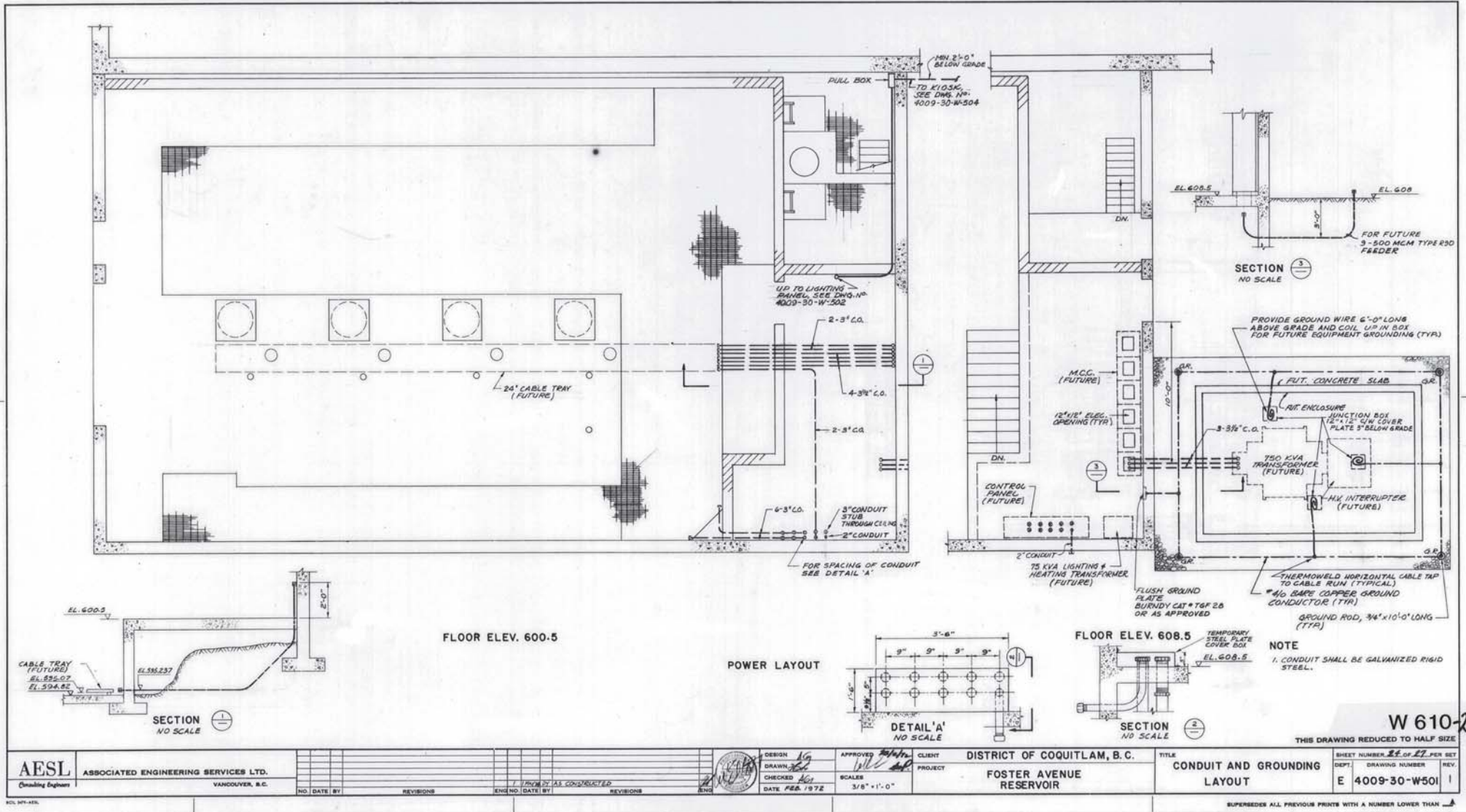
DISTRICT OF COQUITLAM, B.C.
FOSTER AVENUE
RESERVOIR

TITLE

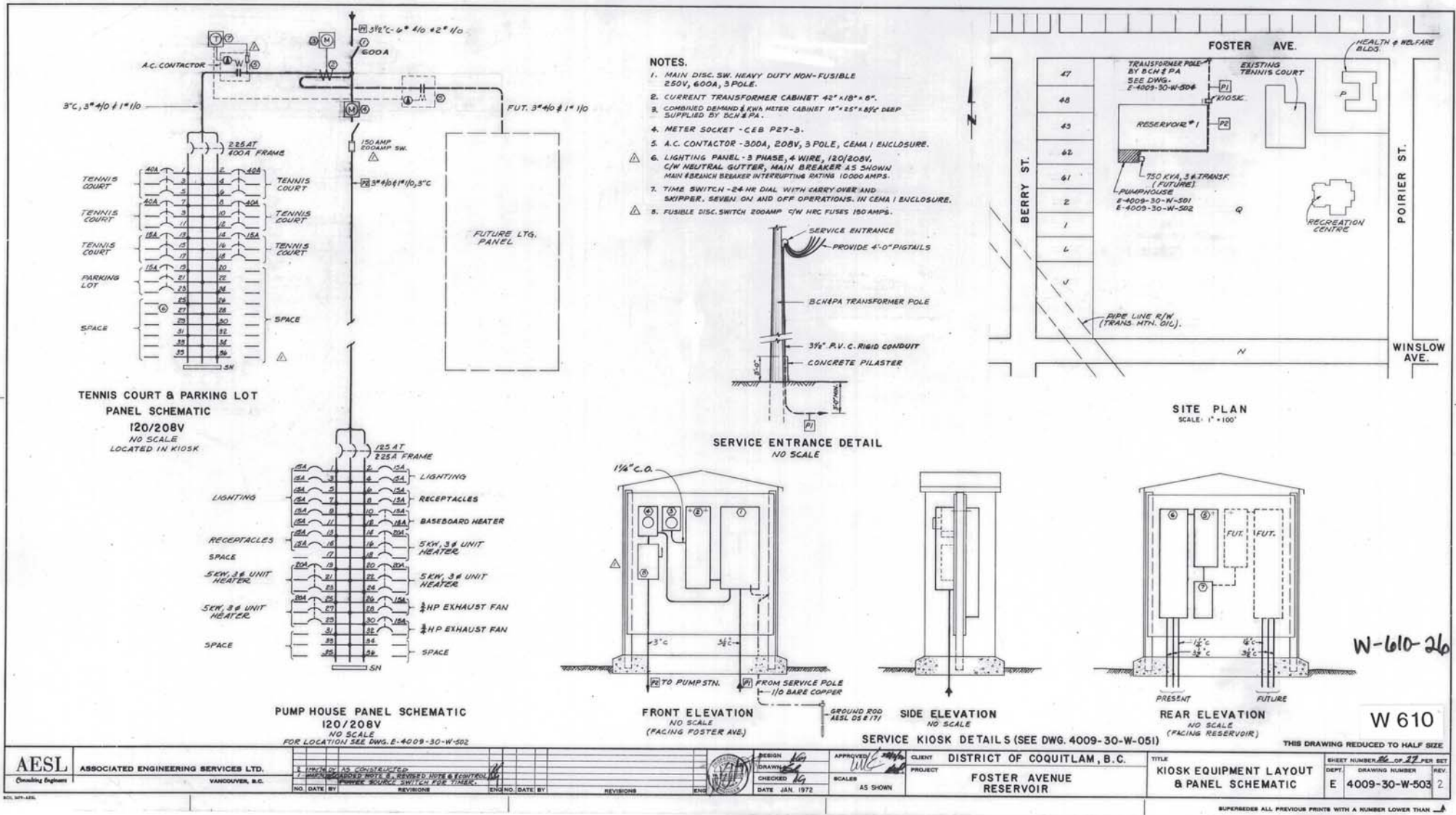
PUMP STATION
SECTIONS
REINFORCEMENT

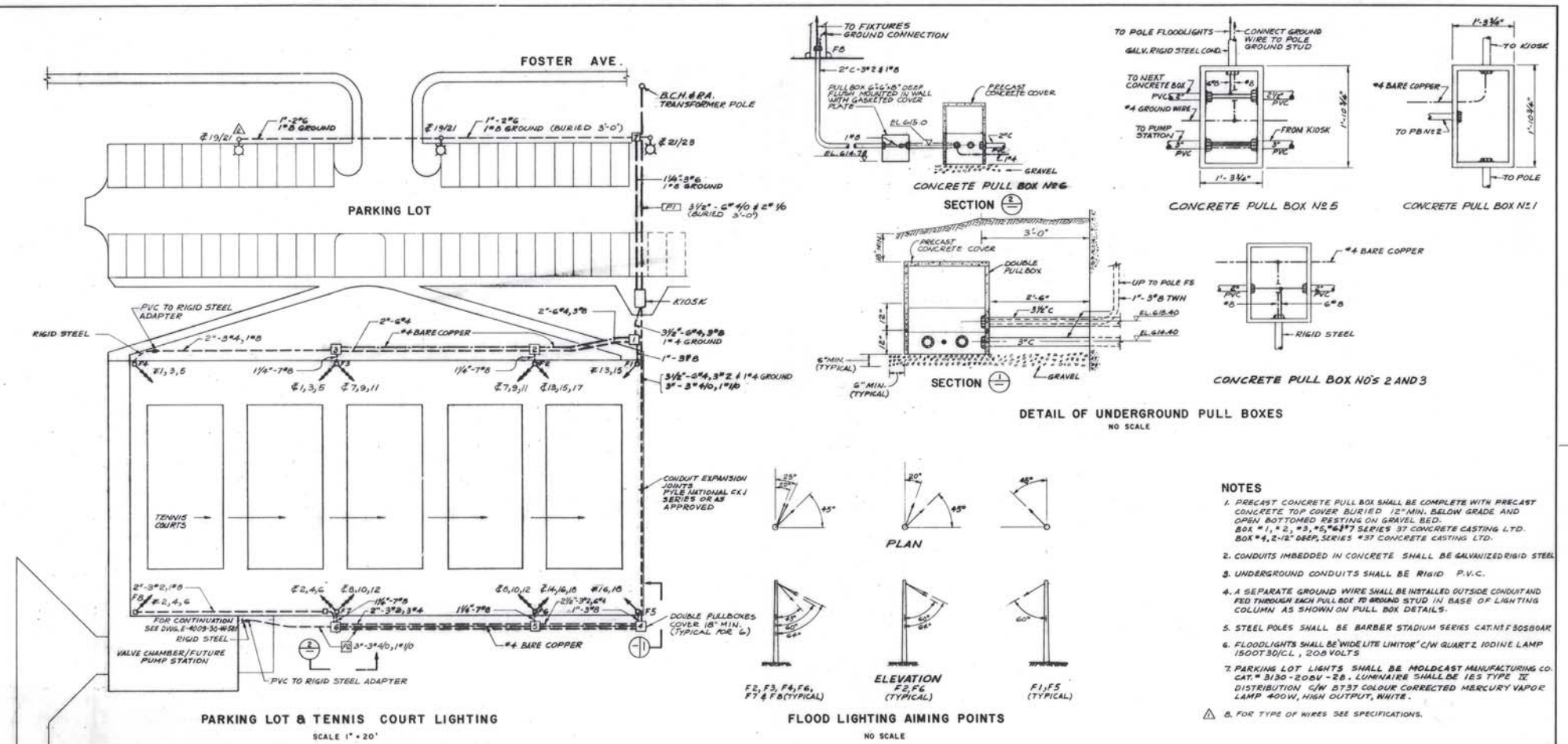
SHEET NUMBER 22 OF 27 PER SET
DEPT. DRAWING NUMBER REV.
S 4009-30-W-415

SUPERSEDES ALL PREVIOUS PRINTS WITH A NUMBER LOWER THAN





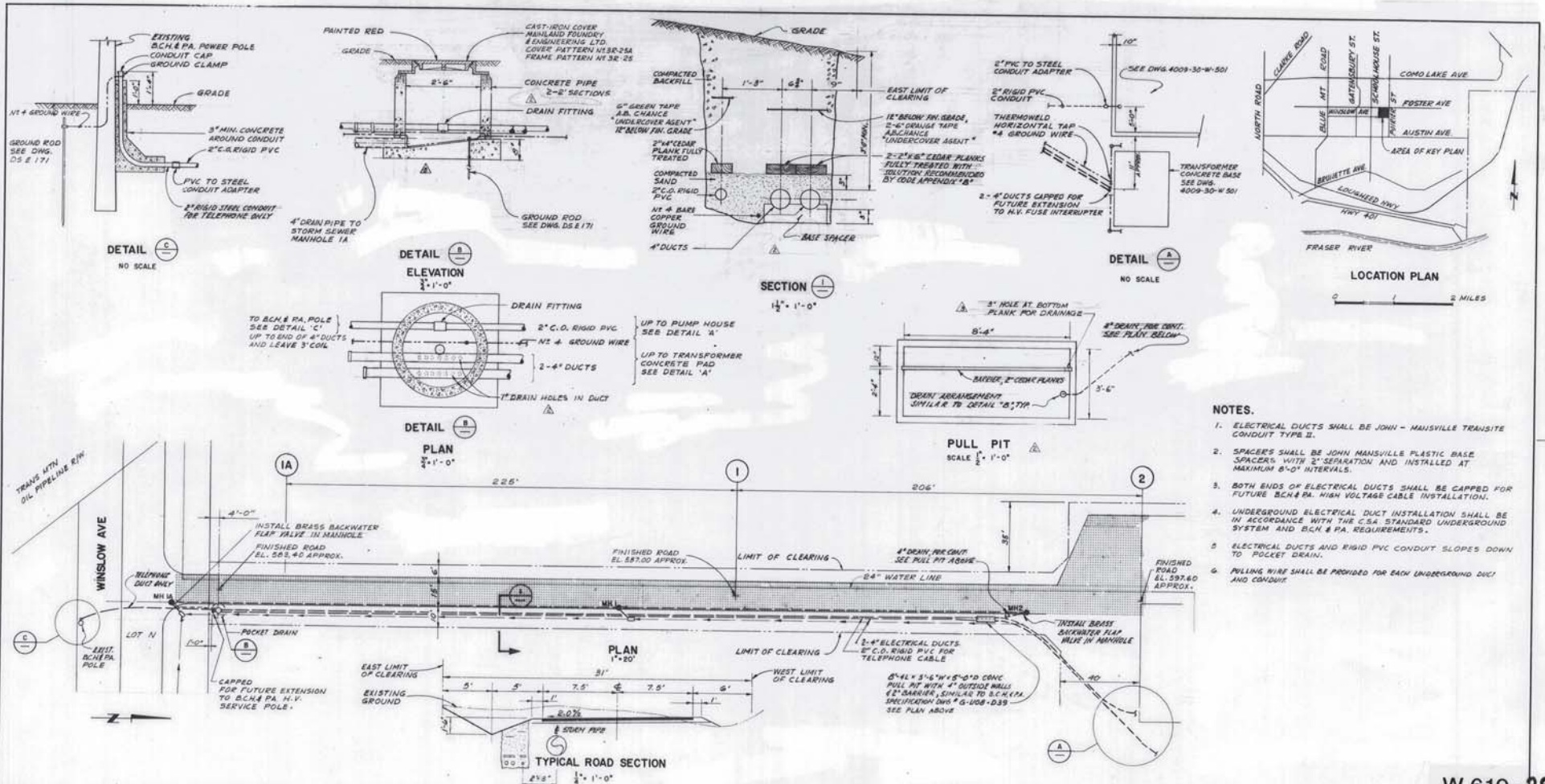




W-610-27

ESL ASSOCIATED ENGINEERING SERVICES LTD. VANCOUVER, B.C.	DESIGN <i>W</i> DRAWN <i>W</i> CHECKED <i>W</i> DATE FEB. 1972	CLIENT DISTRICT OF COQUITLAM, B.C. PROJECT FOSTER AVENUE RESERVOIR	TITLE FLOOD LIGHTING LAYOUT SHEET NUMBER 27 OF 27 PER SET DEPT. E DRAWING NUMBER 4009-30-W-504 REV. 3
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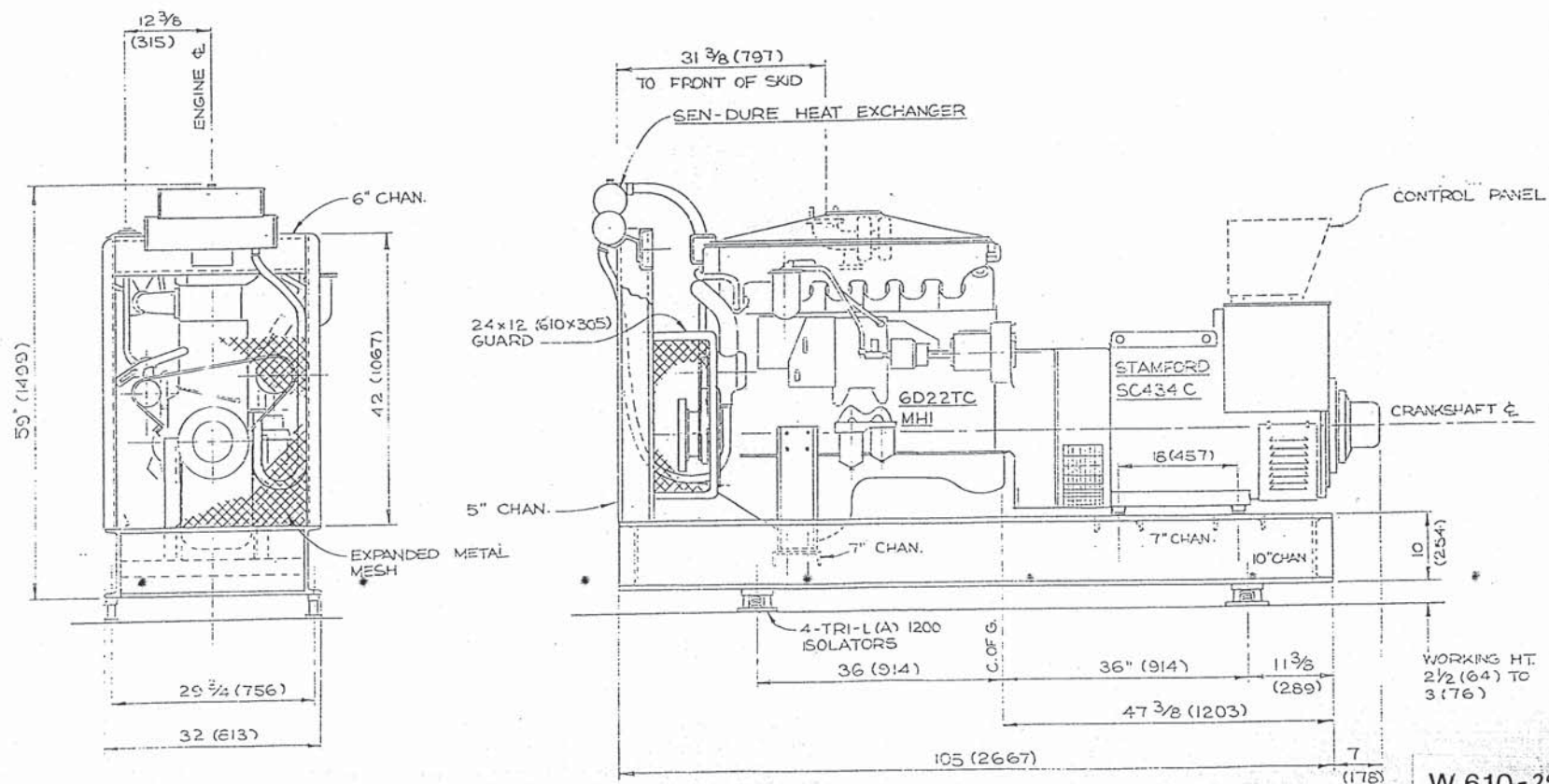
SUPERSEDES ALL PREVIOUS PRINTS WITH A NUMBER LOWER THAN 3



- NOTES.**
1. ELECTRICAL DUCTS SHALL BE JOHN - MAUSVILLE TRANSITE CONDUIT TYPE 2.
 2. SPACERS SHALL BE JOHN MAUSVILLE PLASTIC BASE SPACERS WITH 2" SEPARATION AND INSTALLED AT MAXIMUM 8'-0" INTERVALS.
 3. BOTH ENDS OF ELECTRICAL DUCTS SHALL BE CAPPED FOR FUTURE B.C.H. HIGH VOLTAGE CABLE INSTALLATION.
 4. UNDERGROUND ELECTRICAL DUCT INSTALLATION SHALL BE IN ACCORDANCE WITH THE C.S.A. STANDARD UNDERGROUND SYSTEM AND B.C.H. REQUIREMENTS.
 5. ELECTRICAL DUCTS AND RIGID PVC CONDUIT SLOPES DOWN TO POCKET DRAIN.
 6. PULLING WIRE SHALL BE PROVIDED FOR EACH UNDERGROUND DUCT AND CONDUIT.

AESL <small>Associated Engineering Services Ltd.</small> <small>Consulting Engineers</small>	ASSOCIATED ENGINEERING SERVICES LTD. <small>VANCOUVER, B.C.</small>	<small>NO. DATE BY</small> <small>REVISIONS</small> <small>ENDING DATE BY</small>	<small>DESIGN</small> <small>DRAWN</small> <small>CHECKED</small> <small>DATE</small>	<small>APPROVED</small> <small>SCALE</small> <small>AS NOTED</small>	<small>CLIENT</small> DISTRICT OF COQUITLAM, B. C. <small>PROJECT</small> FOSTER AVENUE RESERVOIR	<small>TITLE</small> ELECTRICAL DUCT INSTALLATION <small>SHEET NUMBER</small> E 4009-30-W-505 <small>PER SET</small> <small>DRAWING NUMBER</small> 4
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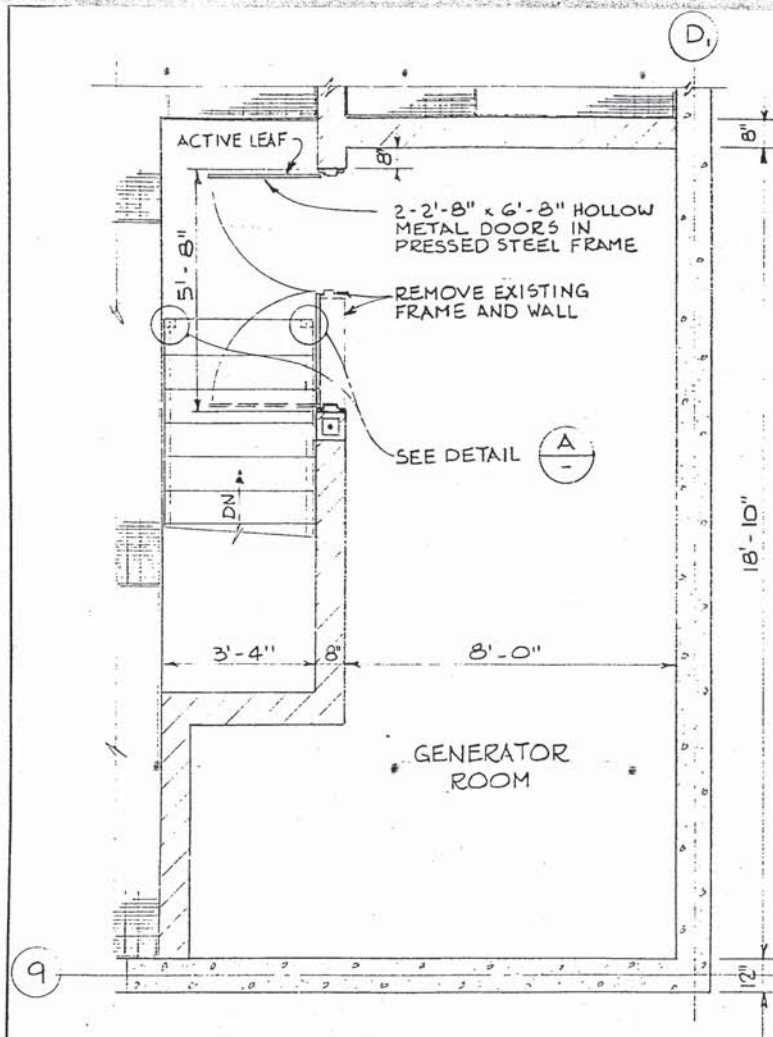
SUPersedes ALL PREVIOUS PRINTS WITH A NUMBER LOWER THAN 4



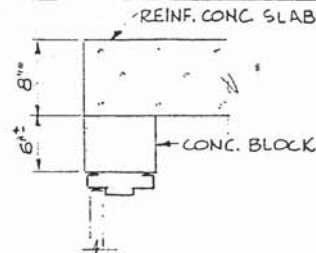
W 610-29

SCALE $\frac{3}{4}" = 1'-0"$		TITLE: MODEL SP220D3PMHI HEAT EXCHANGER COOLING		SIMPOWER generator systems	
DRAWN BY: S. C.		DATE: 8/6/11/27		DESIGN NO. 7358	COMPONENT GROUP 1000
CHECKED BY: CAB		DATE:		DWG. NO. B 236	REV. C
NO.		REVISIONS			
C		H.E. PIPING ADDED			
B		INSTALLED SEN-DURE HEAT EXCHANGER			
		57/1/5	CAB		
		8/6/12/C5	CAB		
		DATE	APP'D BY		

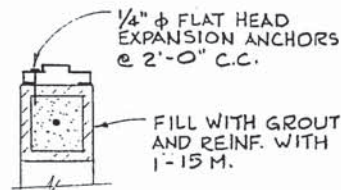
CATCH - 01537



PLAN
3/8" = 1'-0"



HEAD DETAIL
1" = 1'-0"



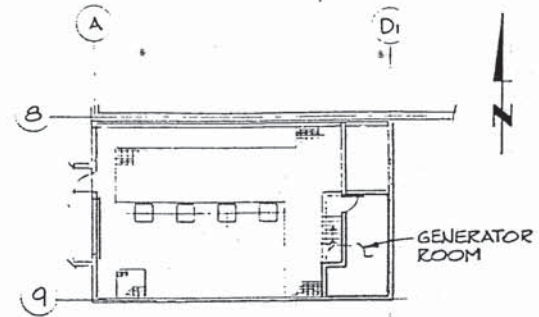
JAMB DETAIL
1" = 1'-0"

REMOVE OR CUT OFF
EXISTING 1/2" ϕ ANCHOR

REPLACE WITH
1/2" HILTI HKD
FLUSH ANCHOR
& 1/2" ϕ BOLT

DRILL NEW
9/16" ϕ HOLE
IN CLIP ANGLE

DETAIL
1" = 1'-0"



KEY PLAN
N.T.S.

NOTES:

1. PRESSED STEEL FRAME TO BE 6 3/4" x 16 GAUGE
2. HOLLOW METAL DOORS TO BE 1 3/4" x 20 GAUGE
3. HARDWARE:
 - INACTIVE LEAF - 1 1/2" PAIR BUTTS
 - FOOT & HEAD BOLTS
 - ASTRAGAL
 - ACTIVE LEAF - 1 1/2" PAIR BUTTS
 - LATCH SET
4. PAINT NEW DOOR & FRAME TO MATCH EXISTING

W 610-30



CLIENT/PROJECT
DISTRICT OF COQUITLAM B.C.

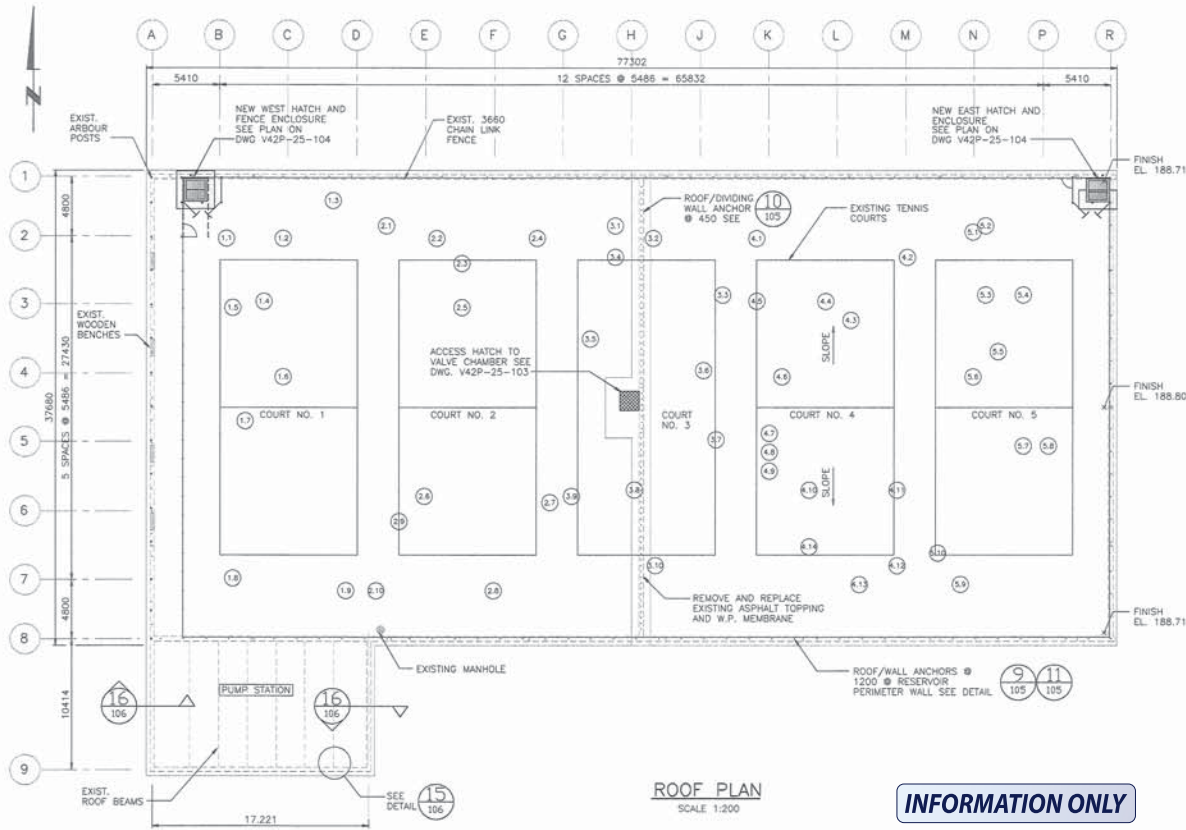
SUBJECT
FOSTER AVE. RESERVOIR
GENERATOR ROOM

APPROVED D.B.H.
DATE DEC. 1986
JOB No. VA50

SCALE AS NOTED
DWG No. VA50-25-101

ASSOCIATED
ENGINEERING

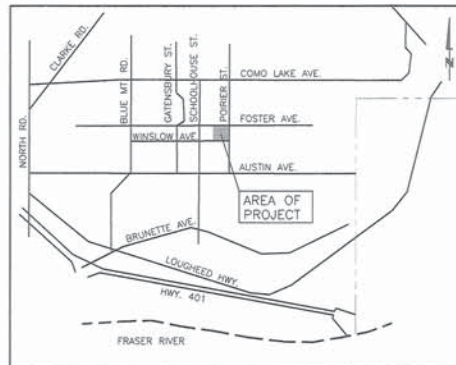




ROOF PLAN
SCALE 1:200

INFORMATION ONLY

NOT A FINAL AS-BUILT DRAWING
WAITING FOR FINAL SUBMISSION
LETTER SENT TO CONSULTANT



LOCATION PLAN
N.T.S.

COQUITLAM, FOSTER AVE. RESERVOIR, TENNIS COURT DETERIORATED PAVEMENT - COURT NO. 1	
AREA NO.	PAVEMENT AREA m ²
1.1	0.8
1.2	4.5
1.3	0.3
1.4	0.3
1.5	1.6
1.6	0.6
1.7	1.2
1.8	0.6
1.9	1.2

COQUITLAM, FOSTER AVE. RESERVOIR, TENNIS COURT DETERIORATED PAVEMENT - COURT NO. 2	
AREA NO.	PAVEMENT AREA m ²
2.1	4.3
2.2	2.9
2.3	10.9
2.4	7.4
2.5	0.2
2.6	0.9
2.7	2.9
2.8	1.8
2.9	1.8
2.10	0.3

COQUITLAM, FOSTER AVE. RESERVOIR, TENNIS COURT DETERIORATED PAVEMENT - COURT NO. 3	
AREA NO.	PAVEMENT AREA m ²
3.1	0.8
3.2	0.6
3.3	0.2
3.4	0.7
3.5	0.2
3.6	4.3
3.7	1.0
3.8	0.4
3.9	0.5
3.10	0.6

COQUITLAM, FOSTER AVE. RESERVOIR, TENNIS COURT DETERIORATED PAVEMENT - COURT NO. 4	
AREA NO.	PAVEMENT AREA m ²
4.1	0.4
4.2	0.6
4.3	1.4
4.4	0.4
4.5	8.4
4.6	3.4
4.7	0.8
4.8	1.0
4.9	0.2
4.10	2.5
4.11	1.4
4.12	2.7
4.13	1.1
4.14	0.2

COQUITLAM, FOSTER AVE. RESERVOIR, TENNIS COURT DETERIORATED PAVEMENT - COURT NO. 5	
AREA NO.	PAVEMENT AREA m ²
5.1	7.8
5.2	1.2
5.3	11.2
5.4	12.0
5.5	1.0
5.6	4.6
5.7	0.6
5.8	2.9
5.9	6.7
5.10	0.6

GENERAL NOTES:

1. (13) = TYPICAL LOCATION OF PROPOSED PAVEMENT REPAIR
2. REMOVE AC PAVEMENT TO A DEPTH OF 25mm WITH RESPECT TO THE ADJACENT PAVEMENT IN AREAS DESIGNATED BY THE ENGINEER.
3. MAINTAIN THE INTEGRITY OF THE WATERPROOF MEMBRANE. ANY DAMAGE SHALL BE REPORTED TO THE ENGINEER FOR ASSESSMENT.

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED				
DATE				

ASSOCIATED ENGINEERING **AE**

DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

ROOF PLAN

Coquitlam
Record Drawing Number

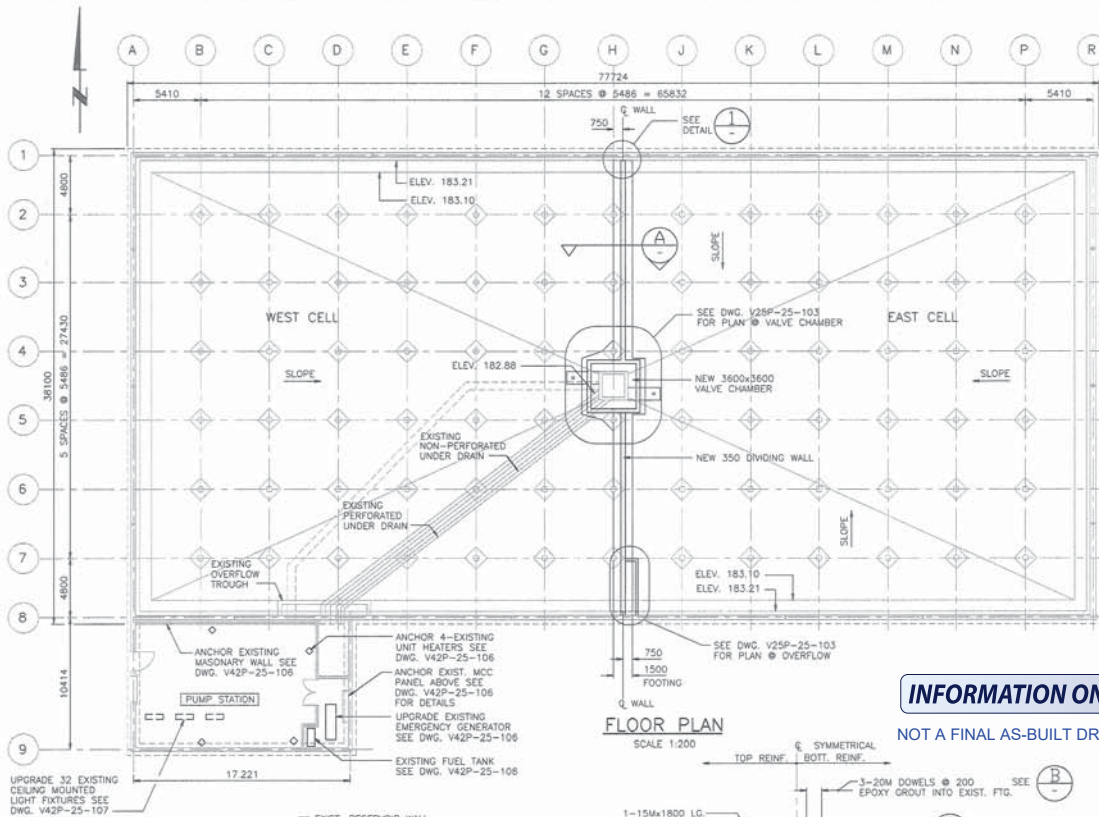
W 610-31

DRAWING NUMBER	REV. NO.	SHEET
V42P-25-101		

IMPORTANT:
HYDRO, GAS AND TELEPHONE ARE NOT LOCATED ON THE CITY OF COQUITLAM AS-BUILTS.
CONTACT BC HYDRO, TERASEN GAS AND TELUS FOR CURRENT AS-BUILTS PERTAINING TO THESE UTILITIES.

NOTE:
LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED BY A PIPE LOCATOR AND MANUAL DIGGING. ALL OR ANY EXISTING STRUCTURES ARE NOT NECESSARILY SHOWN.

THIS PHOTOCOPY IS SUPPLIED BY THE CITY OF COQUITLAM FOR GENERAL INFORMATION ONLY AND THE ACCURACY OR INFORMATION CONTAINED ON THE DOCUMENT IS NO WAY GUARANTEED BY THE CITY.

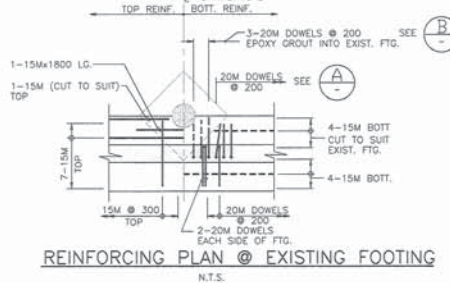


FLOOR PLAN

SCALE 1:200

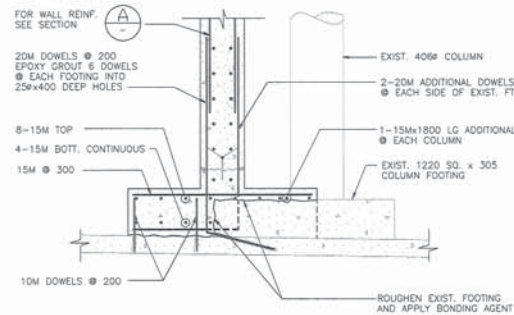
INFORMATION ONLY

NOT A FINAL AS-BUILT DRAWING



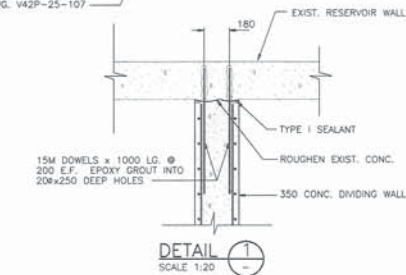
REINFORCING PLAN @ EXISTING FOOTING

N.T.S.



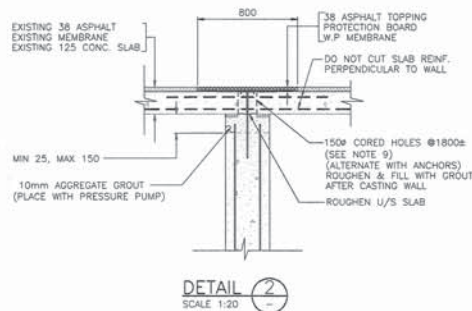
WALL FOOTING DETAIL @ EXIST. COLUMN FOOTING

SCALE 1:20



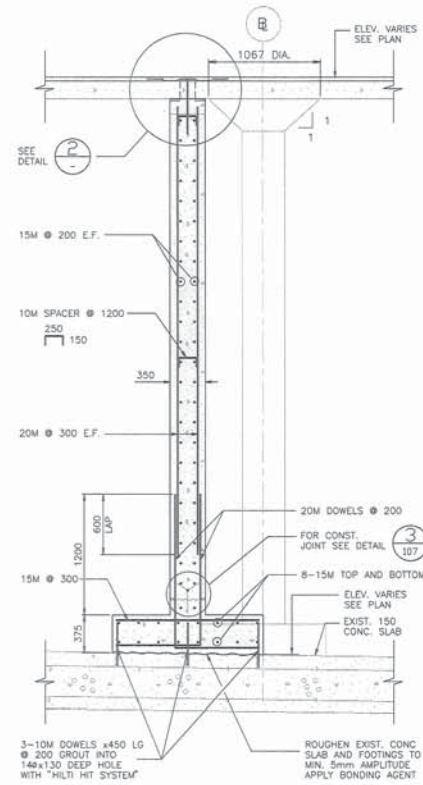
DETAIL 1

SCALE 1:20



DETAIL 2

SCALE 1:20



SECTION A-A

SCALE: 1=25

NOTES:

- MAXIMUM CONSTRUCTION LOAD ON ROOF
 - 1.9 kPa (40 PSF) OR
 - 1-2500 kg GVW VEHICLE
- CONCRETE TO CAN 3-423.1 E.A.N., 25MPa @ 28 DAYS, SEE SPEC. FOR MIN. CEMENT.
- REINF. TO CSA G30.12-M, GRADE 400
 - MINIMUM CLEAR COVER = 50mm
 - REINF. LAPS=45 BAR DIAMETERS, EXCEPT AS NOTED.
- ROUGHEN EXISTING SLAB UNDER NEW FOOTING BY SHOT BLASTING.
- FLOOR DOWELS AND ANCHORS TO BE TESTED AS NOTED IN SPEC.
- PROVIDE FORMWORK WINDOWS AS REQUIRED FOR ACCESS TO VIBRATE CONCRETE.
- LOCATE CONTROL JOINTS IN DIVIDING WALL TO MATCH EXISTING ROOF JOINTS (MAXIMUM SPACING = 12000).
- ALL METAL FABRICATION HOT DIP GALVANIZED E.A.N.
- LOCATE TOP AND BOTTOM SLAB REINF. WITH PACHOMETER PRIOR TO CORING HOLES IN ROOF.
- FOR APPROX. LOCATION OF EXISTING ELEC. CONDUIT SEE DWG. 4009-30-W-504. CONTRACTOR TO CONFIRM LOCATION PRIOR TO CORING OR CUTTING CONCRETE.
- SEE MECH. DWG FOR NEW PIPING IN RESERVOIR AND PUMP STATION.
- SEE ELEC. DWG. FOR NEW CONDUIT IN RESERVOIR AND PUMP STATION.
- METAL FABRICATIONS IN PUMP STATION TO BE PAINTED.

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NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED				
DATE				

ASSOCIATED ENGINEERING

DISTRICT OF COQUITLAM

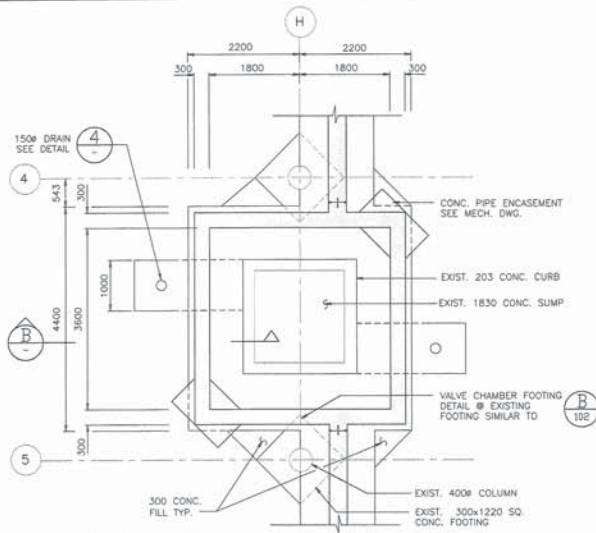
FOSTER AVENUE RESERVOIR

FLOOR PLAN AND DETAILS

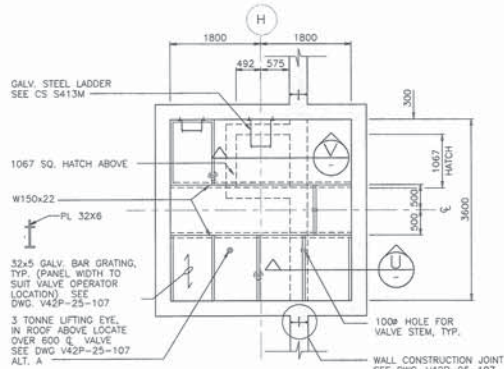
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DRAWING NUMBER	REV NO.	SHEET
V42P-25-102		

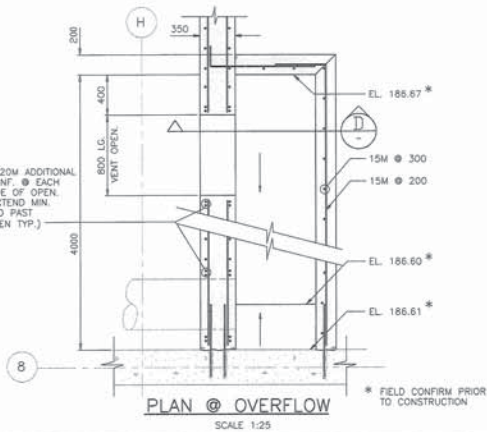
REC'D FILE 4/2/2021



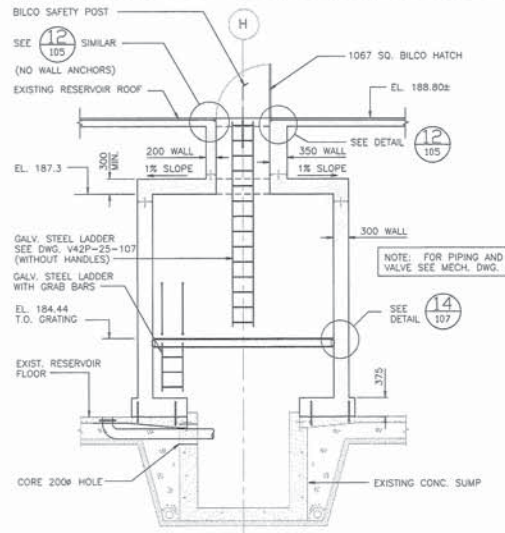
FOUNDATION PLAN @ VALVE CHAMBER
SCALE 1:50



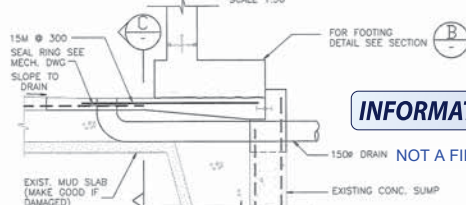
GRATING PLAN
SCALE 1:50



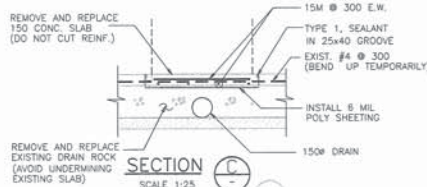
PLAN @ OVERFLOW
SCALE 1:25



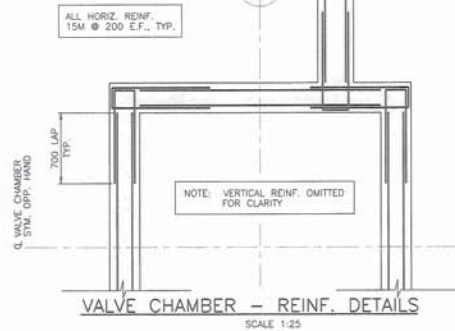
VALVE CHAMBER-SECTION
SCALE 1:50



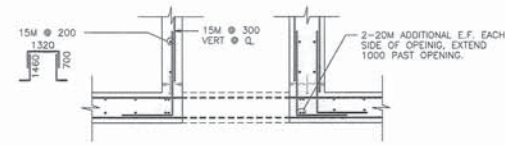
DRAIN DETAIL
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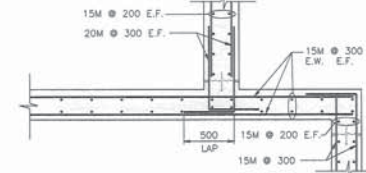
SECTION
SCALE 1:25



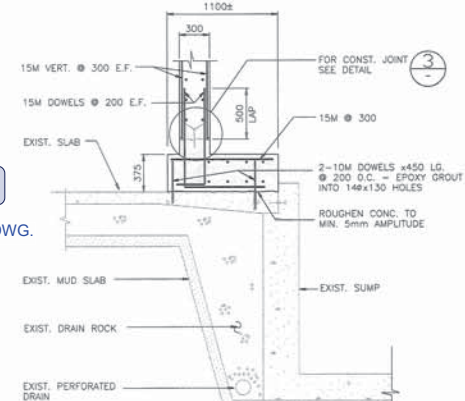
VALVE CHAMBER - REINF. DETAILS
SCALE 1:25



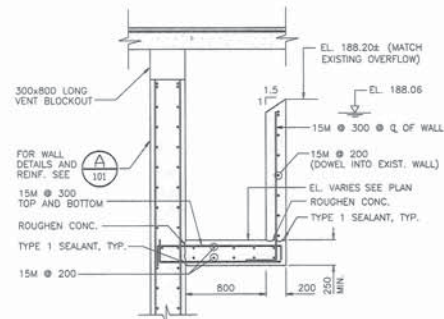
SECTION V
SCALE 1:25



SECTION U
SCALE 1:25



SECTION B
SCALE 1:25



SECTION @ OVERFLOW
SCALE 1:25

NOTE:

1. SEE MECH. DWG. FOR PIPING

INFORMATION ONLY

NOT A FINAL AS-BUILT DWG.

IMPORTANT:
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THE CITY OF COQUITLAM AS-BUILTS.
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WAY GUARANTEED BY THE CITY.

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED				
DATE				

ASSOCIATED
ENGINEERING

DISTRICT OF COQUITLAM

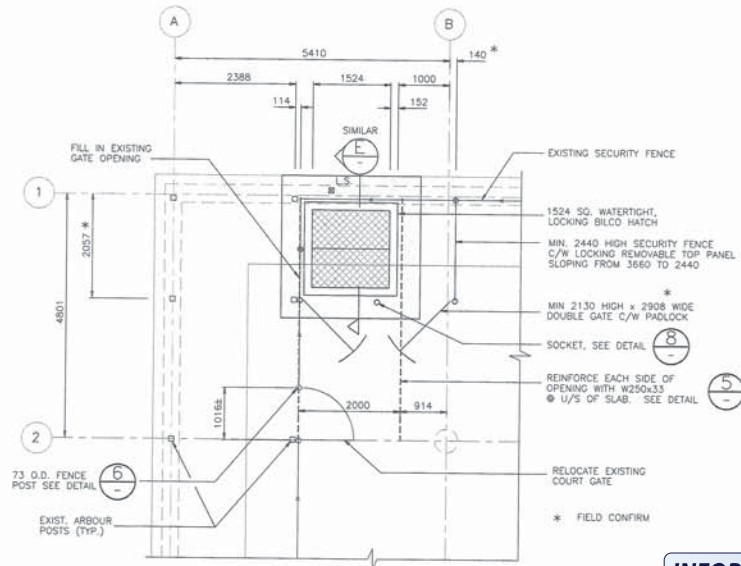
FOSTER AVENUE RESERVOIR

VALVE CHAMBER DETAILS

Coquitlam
Regional District

W 610-33

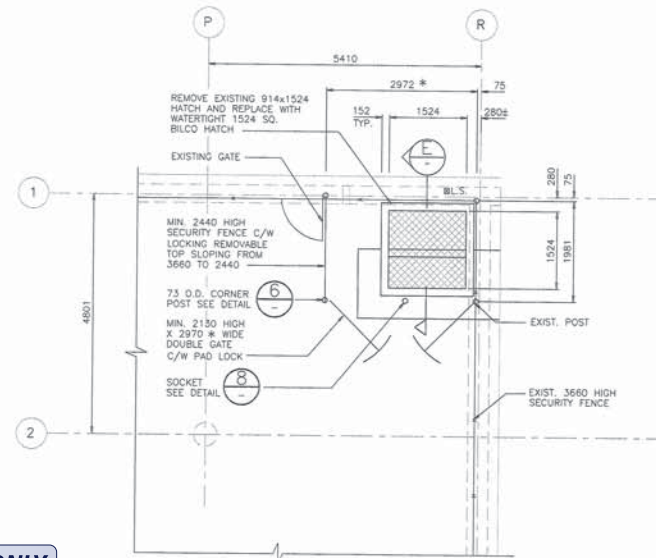
DRAWING NUMBER	REV. NO.	SHEET
V42P-25-103		



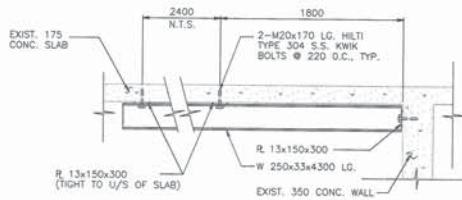
PLAN @ WEST ACCESS HATCH
SCALE 1:50

INFORMATION ONLY

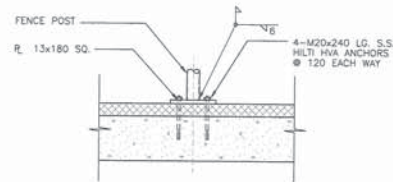
NOT A FINAL AS-BUILT DWG.



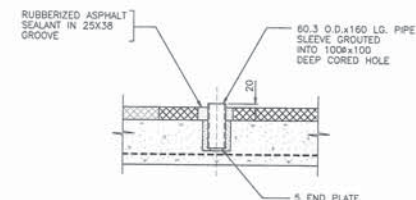
PLAN @ EAST ACCESS HATCH
SCALE 1:50



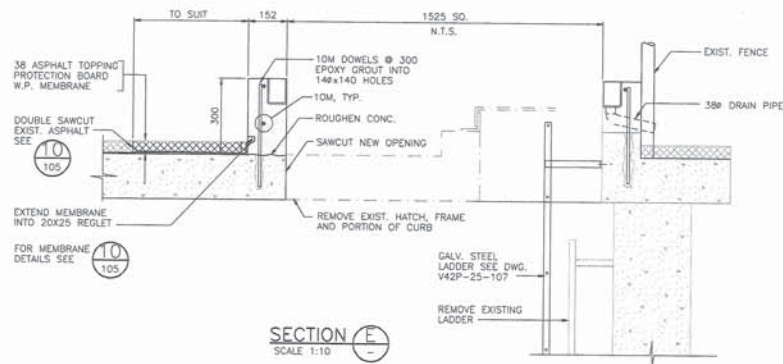
HATCH OPENING REINFORCING BEAM DETAIL (5)
N.T.S.



FENCE POST ANCHOR PLATE DETAIL (6)
N.T.S.



GATE SOCKET DETAIL (8)
N.T.S.



SECTION E
SCALE 1:10

IMPORTANT:
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NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED				
DATE				

ASSOCIATED
ENGINEERING **AE**

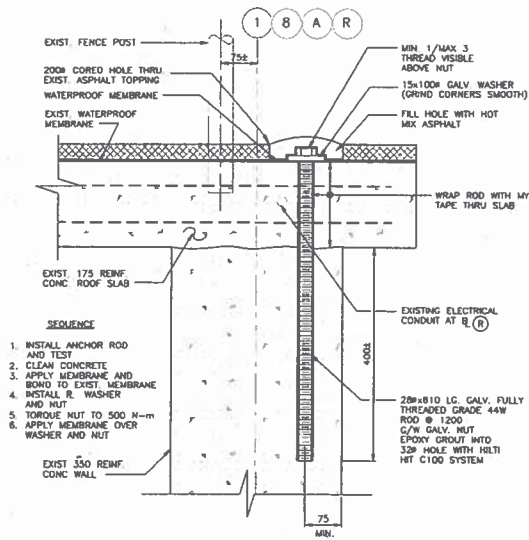
DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVIOR

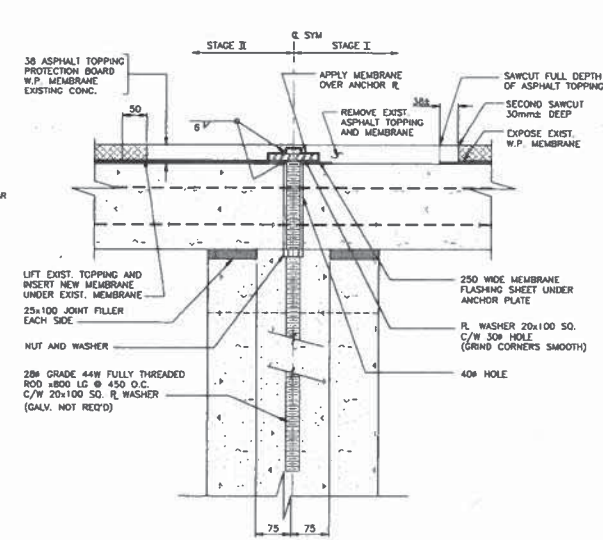
ROOF HATCH DETAILS

Coquitlam W 610-34
Record Drawing Number

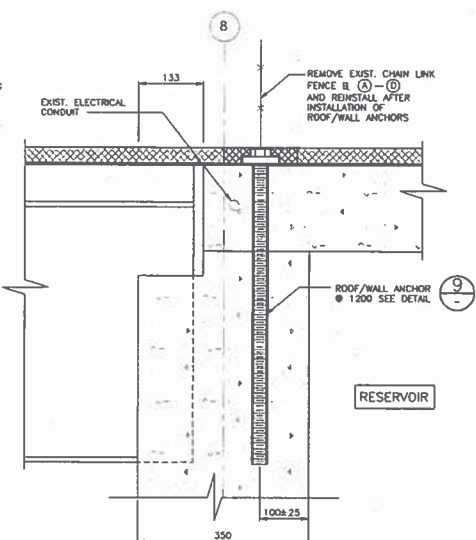
DRAWING NUMBER	REV NO.	SHEET
V42P-25-104		



ROOF/WALL ANCHOR DETAIL (9)
SCALE 1:5



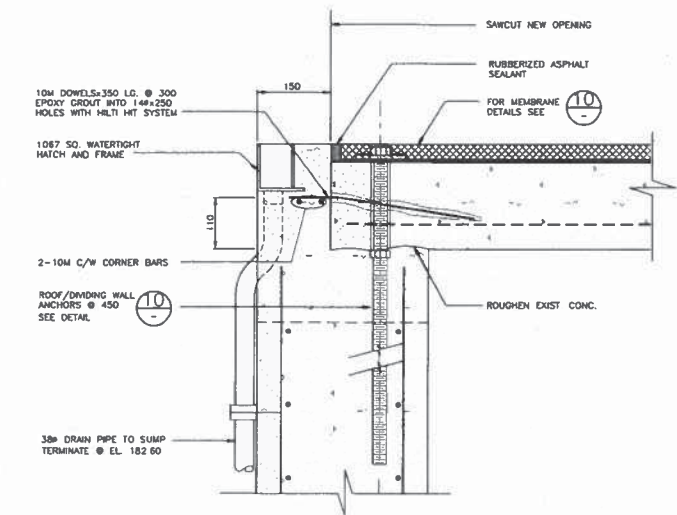
ROOF/DIVIDING WALL ANCHOR DETAIL (10)
SCALE 1:5



ROOF/WALL ANCHOR @ PUMP STATION (11)
SCALE 1:5

INFORMATION ONLY

NOT A FINAL AS-BUILT DWG.



DETAIL (12)
SCALE 1:5

IMPORTANT:
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NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED				
APPROVED				
DATE				

ASSOCIATED ENGINEERING

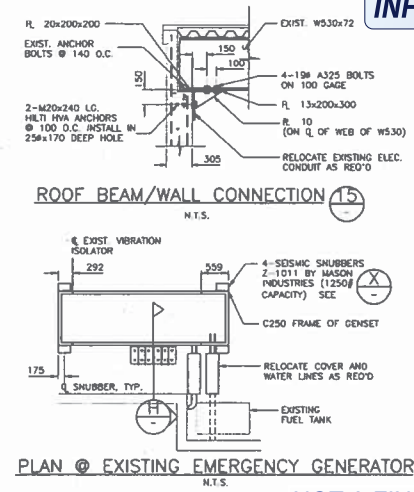
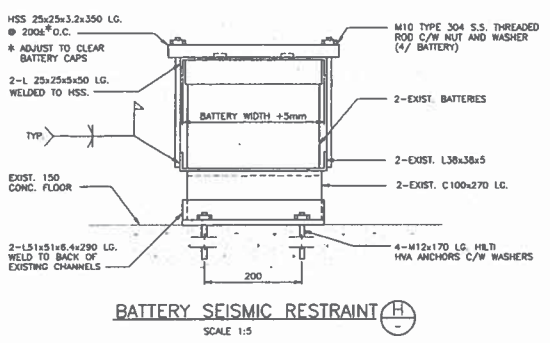
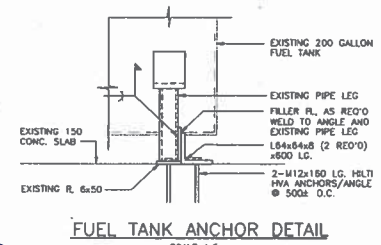
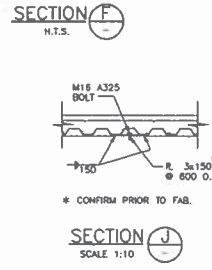
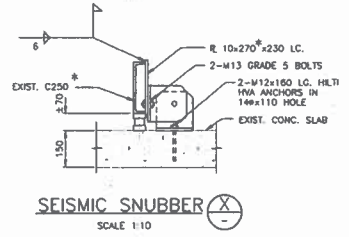
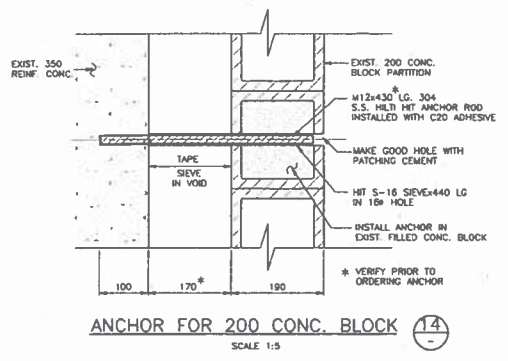
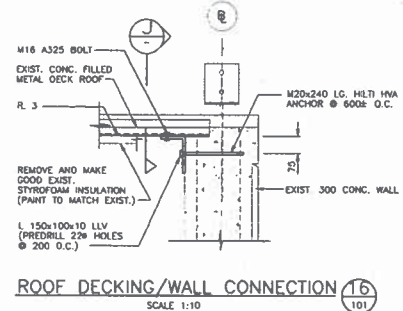
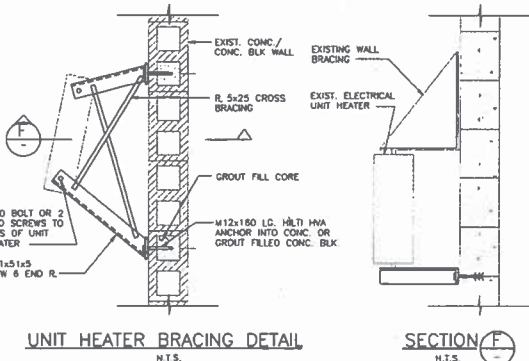
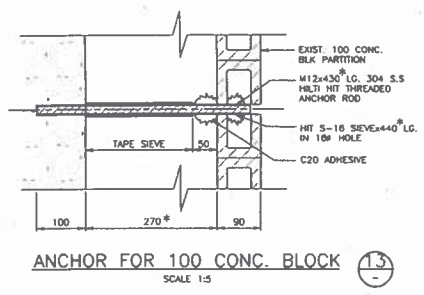
DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

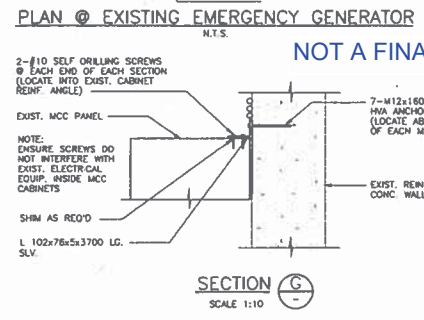
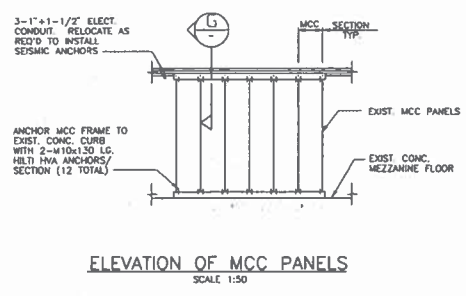
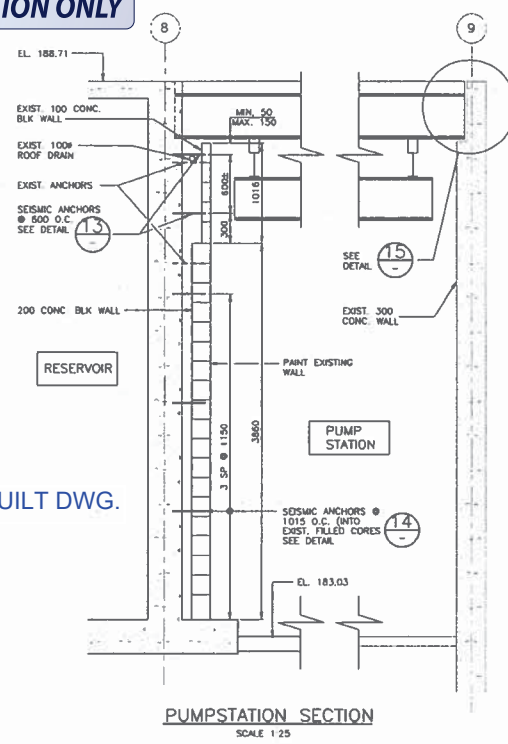
Coquitlam
Record Drawing Number

DETAILS
W 610-35

DRAWING NUMBER	REV NO.	SHEET
V42P-25-105		



INFORMATION ONLY



NOT A FINAL AS-BUILT DWG.

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NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.	V42P			
SCALE	AS SHOWN			
DRAWN	C.L.			
DESIGNED	D.H.			
CHECKED	D.H.			
APPROVED	D.H.			
APPROVED	D.H.			
DATE				

ASSOCIATED ENGINEERING

DISTRICT OF COQUITLAM

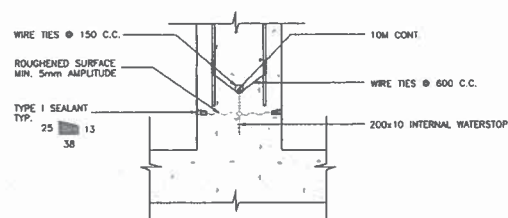
FOSTER AVENUE RESERVOIR

Coquitlam
Record Drawing Number

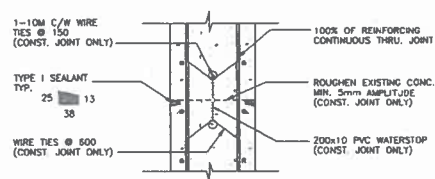
PUMP STATION DETAILS

W 610-36

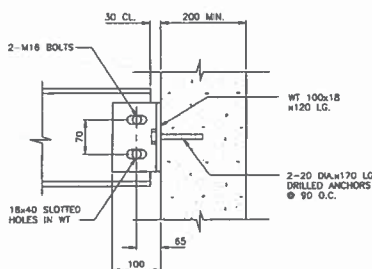
DRAWING NUMBER	REV NO	SHEET
V42P-25-106		



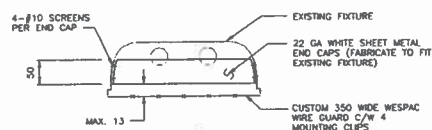
FOOTING/WALL CONSTRUCTION JOINT (3)
SCALE 1:10
10/1/02



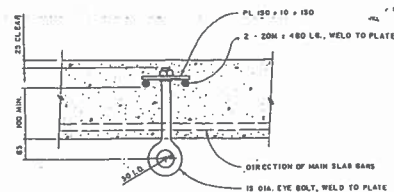
VERTICAL WALL CONSTRUCTION/CONTROL JOINT
SCALE 1:10



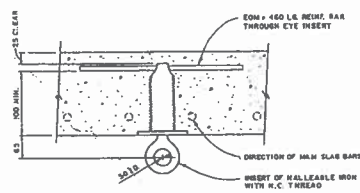
BEAM CONNECTION DETAIL (14)
SCALE 1:10 103



LIGHTING FIXTURE RETROFIT DETAIL
NTS



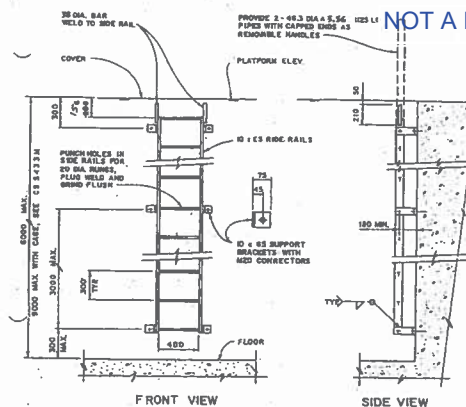
ALTERNATIVE A



ALTERNATIVE B

- NOTES:
1. MATERIALS SHALL BE HOT-DIP ZINC COATED.
 2. LIFTING EYES AND ANCHORAGES SHALL HAVE A WORKING LOAD CAPACITY OF 3000 KB. AND ULTIMATE CAPACITY OF NOT LESS THAN 9000 KB.
 3. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

LIFTING EYE
3 TONNE CAPACITY

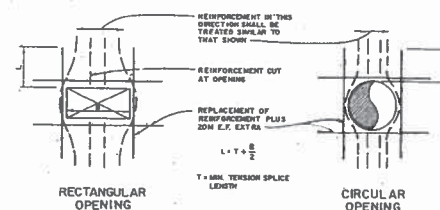


- NOTES:
1. CONNECTION OF SUPPORT BRACKETS TO STRUCTURE:
 - a. CONC. BLOCK - NED THRU- BOLTS C/W MALLEABLE IRON WASHER
 - b. REINFORCED CONC. - NED DRILLED & BOLTS
 - c. WOOD - NED THRU - BOLTS C/W MALLEABLE IRON WASHER
 - d. STEEL STRUCTURES - FIELD WELD.
 2. NOT TO BE GALVANIZED AFTER FABRICATION
 3. SAFETY CAGE SHALL BE PROVIDED WHEREVER THE HEIGHT OF PLATFORM OVER FLOOR EXCEEDS 6000
 4. RISE SPECIFIC SHALL BE UNIFORM
 5. MATERIAL SHALL CONFORM TO ASTM A36
 6. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED

STEEL LADDER UNDER GRATING
OR HATCH COVER

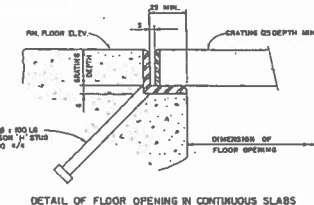


OPENINGS 100 TO 300 RECTANGULAR, SQUARE OR ROUND

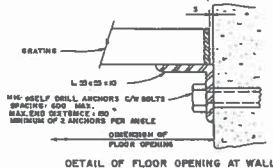


- NOTES**
1. NUMBER OF REINFORCING BARS OUT SHALL BE KEPT TO A MINIMUM AS MANY BARS AS POSSIBLE SHALL BE REFLECTED AROUND CORNER.
 2. REINFORCING BARS SHALL BE KEPT 50 CLEAR OF OPENING.
 3. WHERE REINFORCEMENT SHOWN ON DRAWING DIFFERS FROM THIS STANDARD, THE DRAWING GOVERNS.
 4. REINFORCEMENT CUT AT OPENINGS SHALL BE REPLACED BY AN EQUAL AMOUNT, HALF AT EACH SIDE OF OPENING IN THE SAME DIRECTION APPLICABLE TO BOTH FACES. EXTRA REINFORCEMENT AT SIDES OF OPENING SHALL BE 50% EACH FACE OF ALL FOUR SIDES.
 5. ADDITIONAL REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS IF OPENING IS WITHIN DISTANCE 'L' OF A CORNER.
 6. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

REINFORCEMENT AROUND OPENING IN SLABS AND WALLS



DETAIL OF FLOOR OPENING IN CONTINUOUS SLABS



- NOTES:**
1. DIMENSIONS OF FLOOR OPENINGS SHALL BE AS SHOWN ON DRAWING.
 2. CHANNELS SHALL HAVE REINFORCING BARS SPACED AT 30 CM CROSS BARS AT 150 CM UNLESS OTHERWISE SPECIFIED.
 3. DEPTH AND THICKNESS OF REINFORCING BARS SHALL DEPEND ON FLOOR LIVE LOAD UNLESS OTHERWISE SPECIFIED.
 4. ALL COLLECTIONS OF LESS THAN 8 CM UNLESS HEAVIER LOADS ARE INDICATED ON DRAWINGS, THE FLOOR SHALL BE REINFORCED WITH 10 CM BARS.
 5. WHERE TOTAL GRATING OVER ONE OPENING WILL WEIGH LESS THAN 250 KG, IT SHALL BE FABRICATED AS ONE SINGLE UNIT.
 6. WHERE ALL OTHER GRATING SHALL BE FABRICATED IN RIGIDS THAT TWO MAN CAN CONVENIENTLY LIFT.
 7. ALL JOINTS SHALL BE REINFORCED AND REINFORCING BARS TO CROSS BARS MUST BE ALLOWED TO MATCH.
 8. SINGLE SUPPORT FRAMES FOR GRATING OVER SQUARE AND RECTANGULAR OPENINGS SHALL BE FABRICATED AS SINGLE UNITS WITH SUPPORTS ON FOUR SIDES. SINGLE REINFORCEMENT MATCH DEPTH OF GRATING.
 9. ALL JOINTS SHALL BE REINFORCED AND REINFORCING BARS TO CROSS BARS MUST BE ALLOWED TO MATCH.
 10. ALL DIMENSIONS IN MM, UNLESS OTHERWISE SPECIFIED.

BAR GRATING COVERS

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WAY GUARANTEED BY THE CITY

NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.		V42P		
SCALE		AS SHOWN		
DRAWN		C.L.		
DESIGNED		D.M.		
CHECKED				
APPROVED				
APPROVED				
DATE				

**ASSOCIATED
ENGINEERING**

DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

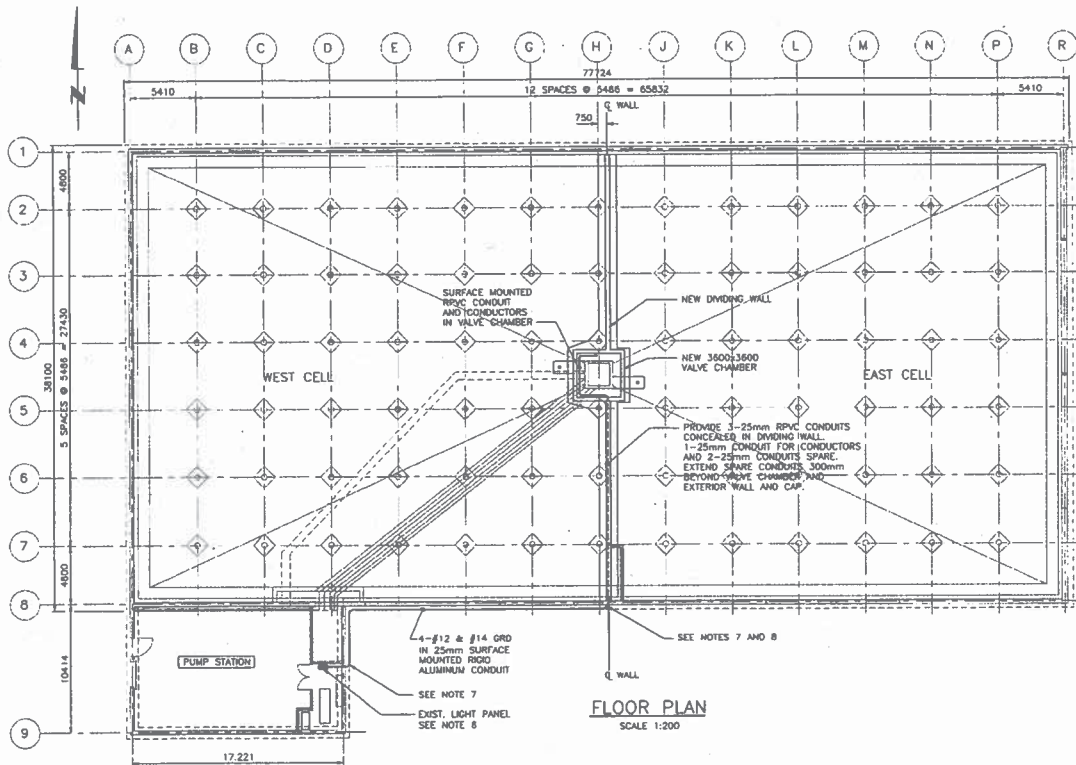
Coquitlam
Record Drawing Number

DETAILS

W 610-37

DRAWING NUMBER	REV NO.	SHEET
V42P-25-107		

DRAWING NUMBER	REV. NO.	SHEET
V42P-30-108		1



FLOOR PLAN
SCALE 1:200

INFORMATION ONLY

NOT A FINAL AS-BUILT DWG.

ELECTRICAL NOTES:

1. COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE WITH CSA C22.1 AND AS AMENDED FOR USE IN THE PROVINCE OF BRITISH COLUMBIA.
2. AFTER COMPLETION OF WORK, FURNISH CERTIFICATES OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT TO THE OWNER. OWNER WILL PROVIDE DRAWINGS REQUIRED BY ELECTRICAL INSPECTION DEPARTMENT.
3. IDENTIFY WIRING WITH TAB SHAW-CODE MARKERS WITH IDENTIFICATION ON BOTH ENDS OF CONDUCTORS.
4. CONDUITS SHALL BE RIGID PVC TO CSA C22.2 NO. 211.2 OR RIGID ALUMINUM AS SPECIFIED. CONCEAL CONDUITS UNLESS OTHERWISE SPECIFIED. PROVIDE NYLON PULL STRING IN ALL SPARE CONDUITS.
5. CONDUCTORS SHALL BE 1000V STRANDED COPPER XLPE RW90. MINIMUM SIZE SHALL BE 12 AWG. FOR POWER AND 14 AWG FOR CONTROL.
6. PROVIDE 1-15A BREAKER FOR VALVE CHAMBER LIGHT AND 1-15A BREAKER FOR GFI RECEPTACLE IN VALVE CHAMBER. TERMINATE CONDUIT TO EXISTING LIGHTING PANEL.
7. CORE HOLE TO PASS CONDUIT THROUGH AND MAKE GOOD ON COMPLETION WITH SMOOTH FINISH TO EXISTING SURFACE. CHECK EXISTING DRAWINGS BEFORE CUTTING OR CORING CONCRETE.
8. INSTALL ALUMINUM-RPVC CONDUIT TRANSITION COUPLING 350mm FROM EXTERIOR WALL FOR 3-25mm CONDUITS.

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NO DATE ENG BY SUBJECT

REVISIONS

PROJECT NO.	V42P
SCALE	AS SHOWN
DRAWN	C.L.
DESIGNED	K.H.
CHECKED	K.H.
APPROVED	
DATE	

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DISTRICT OF COQUITLAM

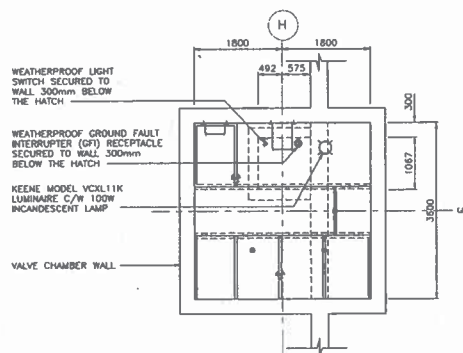
FOSTER AVENUE RESERVOIR

Coquitlam
Record Drawing Number

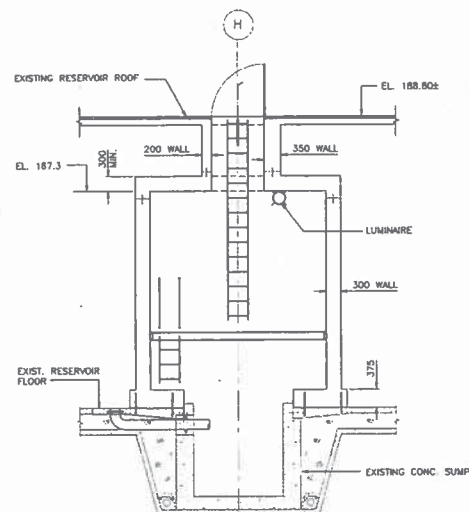
ELECTRICAL POWER LAYOUT

W 610-40

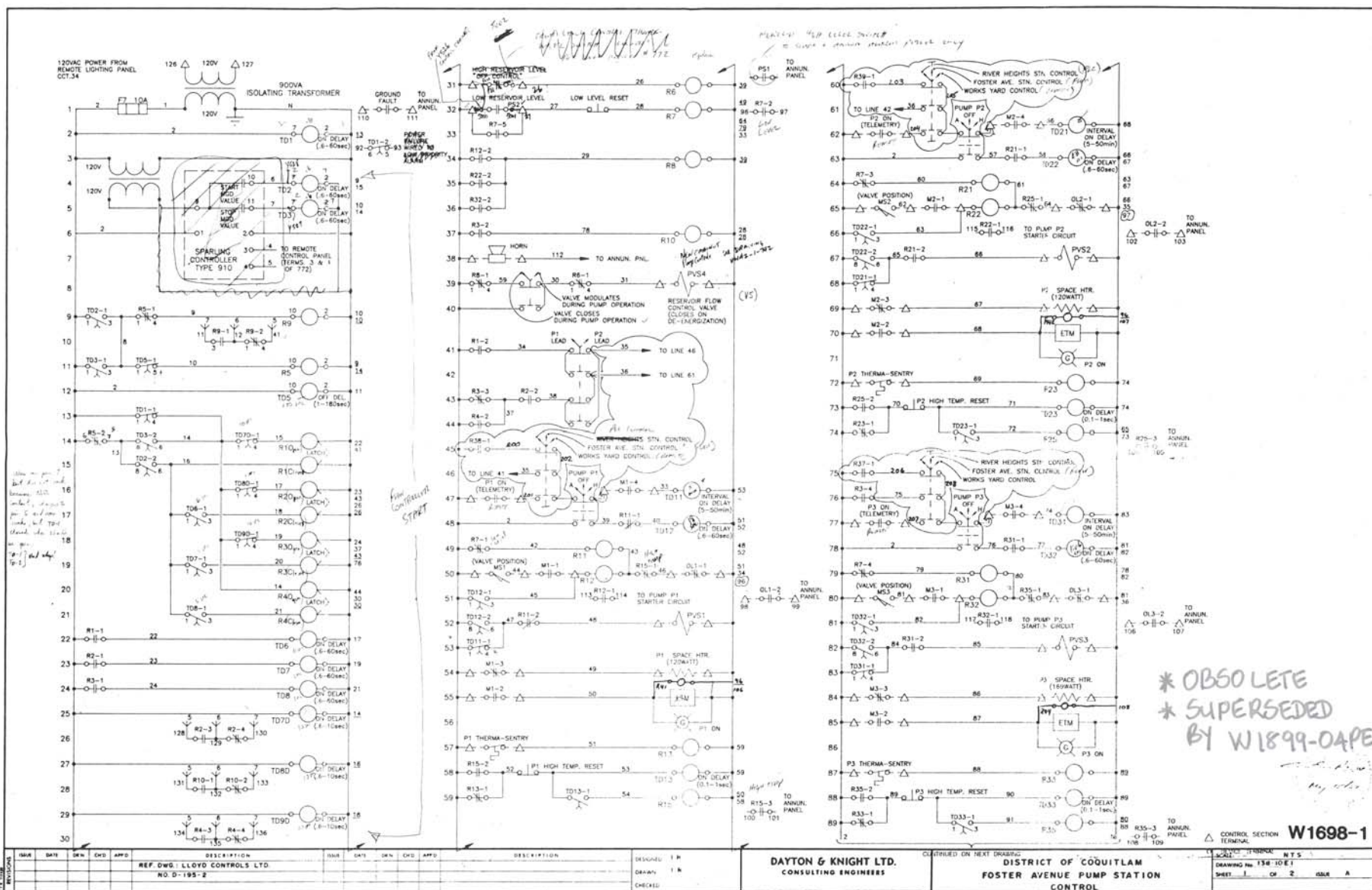
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V42P-25-110		

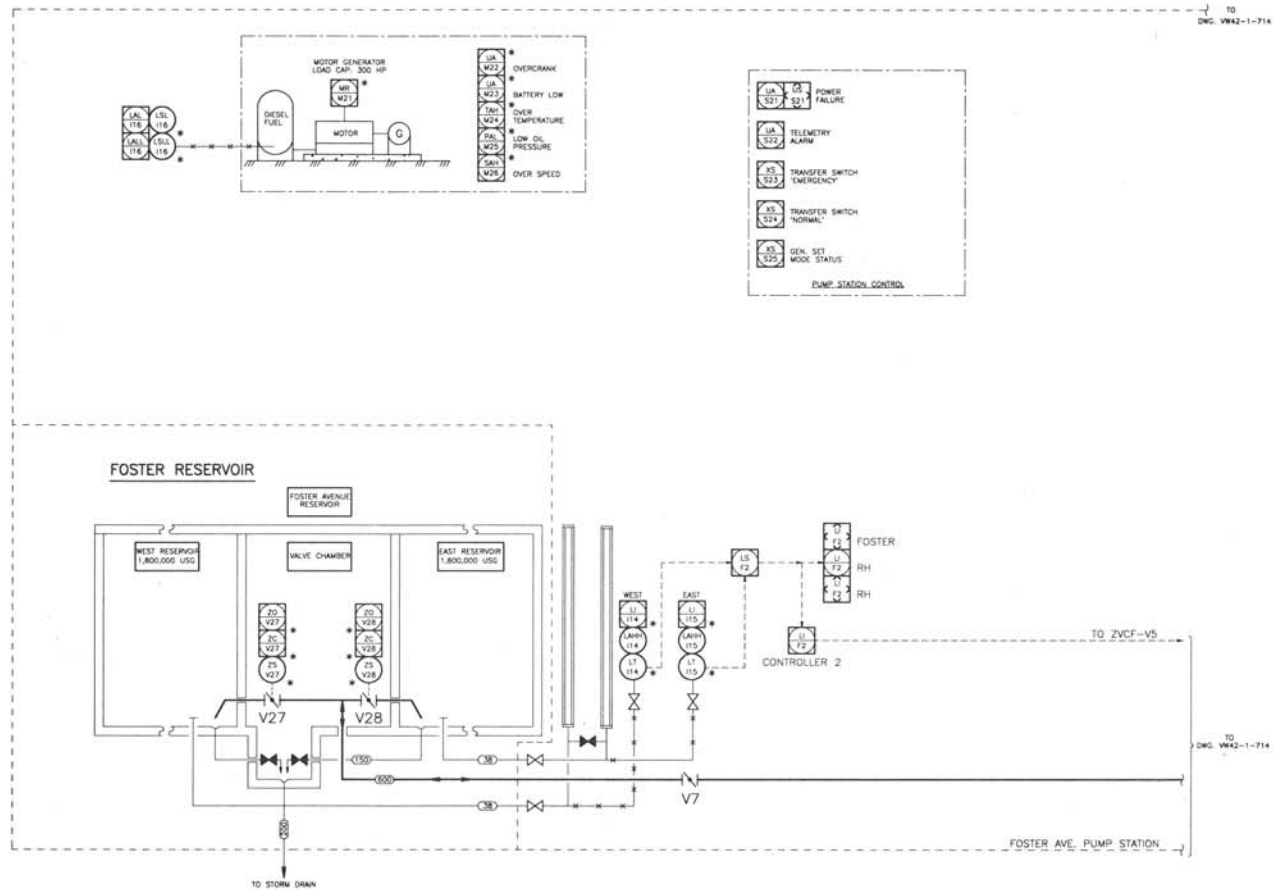


VALVE CHAMBER PLAN
SCALE 1:50

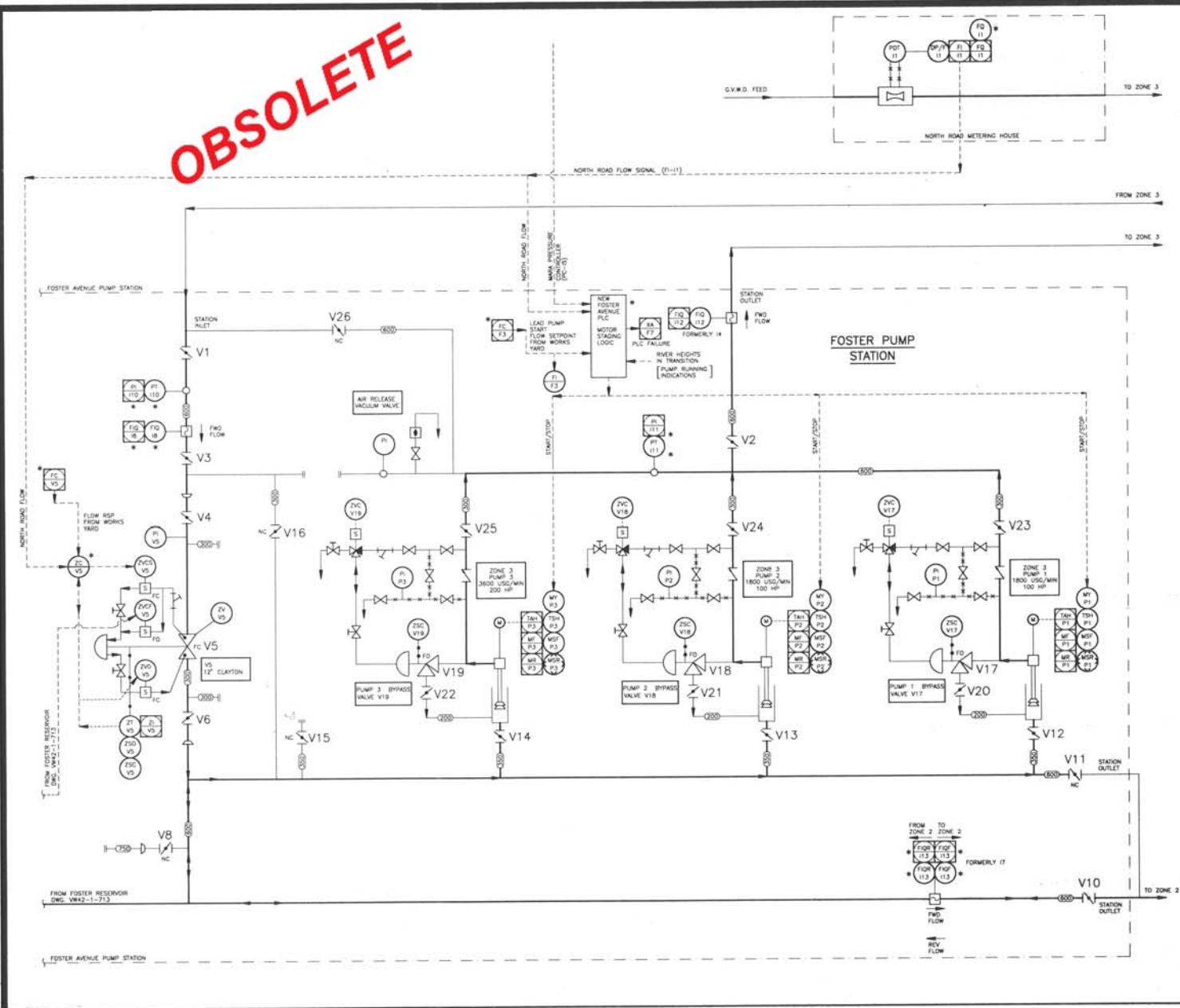


VALVE CHAMBER-SECTION
SCALE 1:50





OBSOLETE



DRAWING LOCATION

713 (FOSTER)	714 (FOSTER)	715 (FOSTER)	716 (FOSTER)
717 (FOSTER)	718 (FOSTER)	719 (FOSTER)	720 (FOSTER)

REVISIONS

NO	DATE	ENG	BY	SUBJECT
3	SEP.12.94	M.L.	S.L.	AS BUILT
2	MAY.25.94	M.L.	S.L.	CONSTRUCTION REVISION
1	NOV.15.93	D.W.	V.P.	ISSUED FOR TENDER
0	SEPT.23.93	D.W.	D.J.	ISSUED FOR REVIEW
A	MAR.23.93	D.W.	D.J.	PRELIMINARY

PROJECT NO: VW42 / 922942

SCALE: N.T.S.

DRAWN: D.J.

DESIGNED: D.W.

CHECKED:

APPROVED:

DATE: MAR.1993

ASSOCIATED ENGINEERING

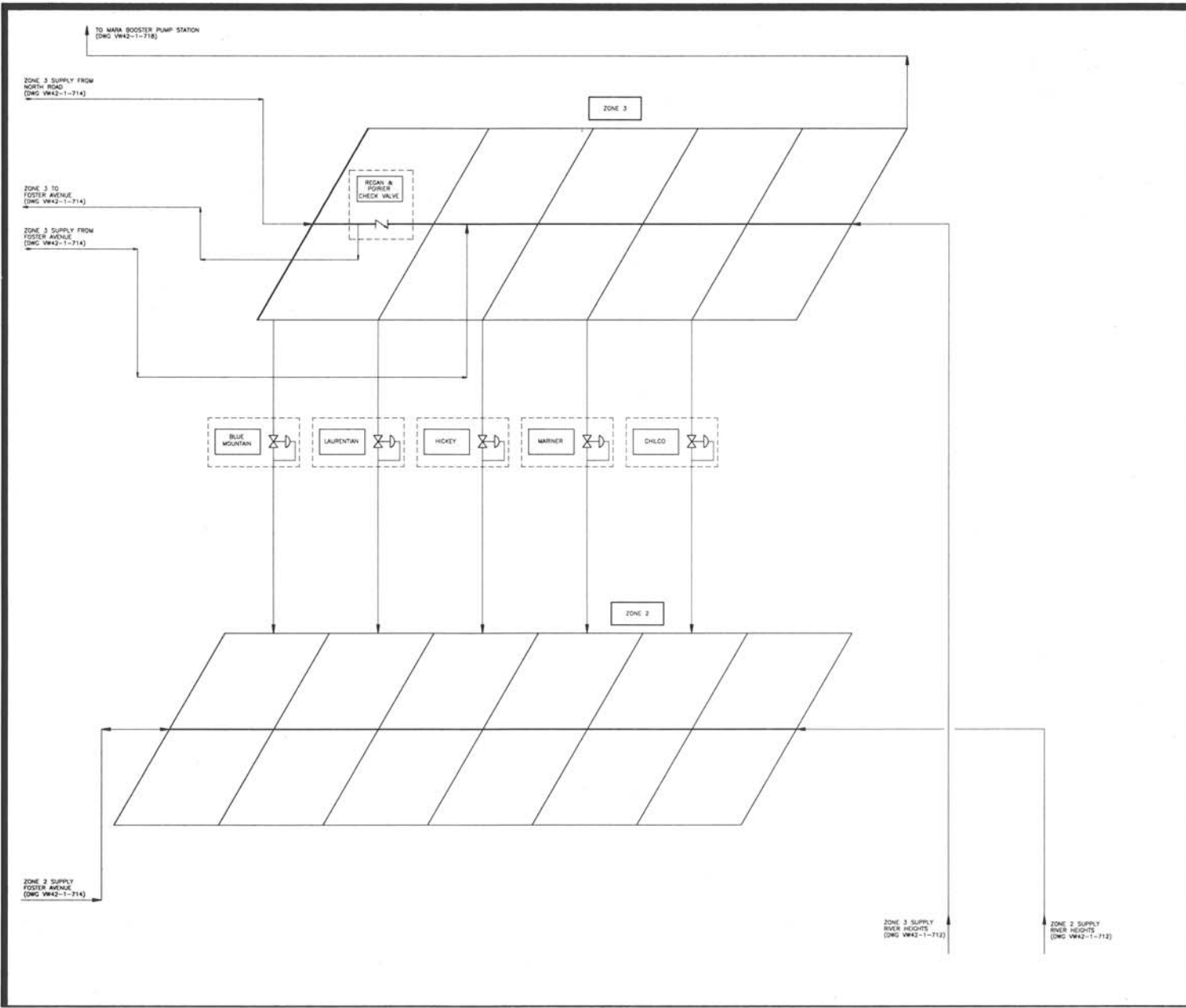
W1703-E

CITY OF COQUITLAM

FOSTER AVENUE PUMP STATION AND NORTH ROAD METERING HOUSE

PIPING AND INSTRUMENTATION DIAGRAM (P. & I.D.)

DRAWING NUMBER	REV NO.	SHEET
VW42-1-714	3	



DRAWING LOCATION

713 (FOSTER)	714 (FOSTER)	715 (FOSTER)	716 (FOSTER)
717 (HEIGHTS)	718 (HEIGHTS)	719 (HEIGHTS)	720 (HEIGHTS)

3	SEP 12 94	M.L.	S.L.	AS BUILT
2	MAY 25 94	M.L.	S.L.	CONSTRUCTION REVISION
1	NOV 15 93	D.W.	V.P.	ISSUED FOR TENDER
0	SEPT 23 93	D.W.	D.J.	ISSUED FOR REVIEW
A	MAR 23 93	D.W.	D.J.	PRELIMINARY
NO	DATE	ENG	BY	SUBJECT

REVISIONS

PROJECT NO.	VW42 / 922942
SCALE	N.T.S.
DRAWN	D.J.
DESIGNED	D.W.
CHECKED	
APPROVED	
DATE	MAR 1993

ASSOCIATED ENGINEERING 

W1703-F

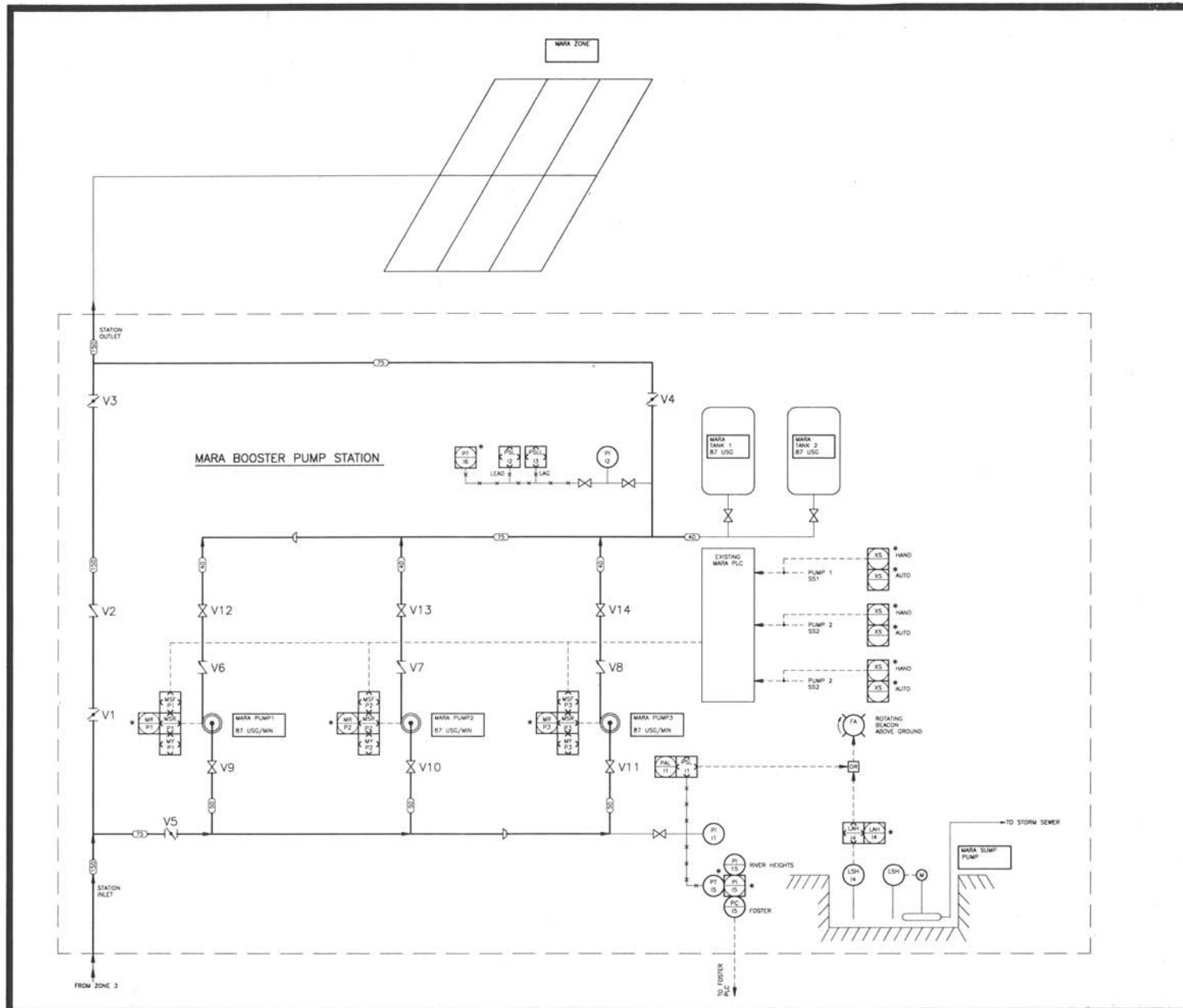
CITY OF COQUITLAM

ZONE 2 AND ZONE 3

PIPING AND INSTRUMENTATION
DIAGRAM (P. & I.D.)

DRAWING NUMBER	REV NO.	SHEET
VW42-1-715	3	

ALCOA TELEPHONICS



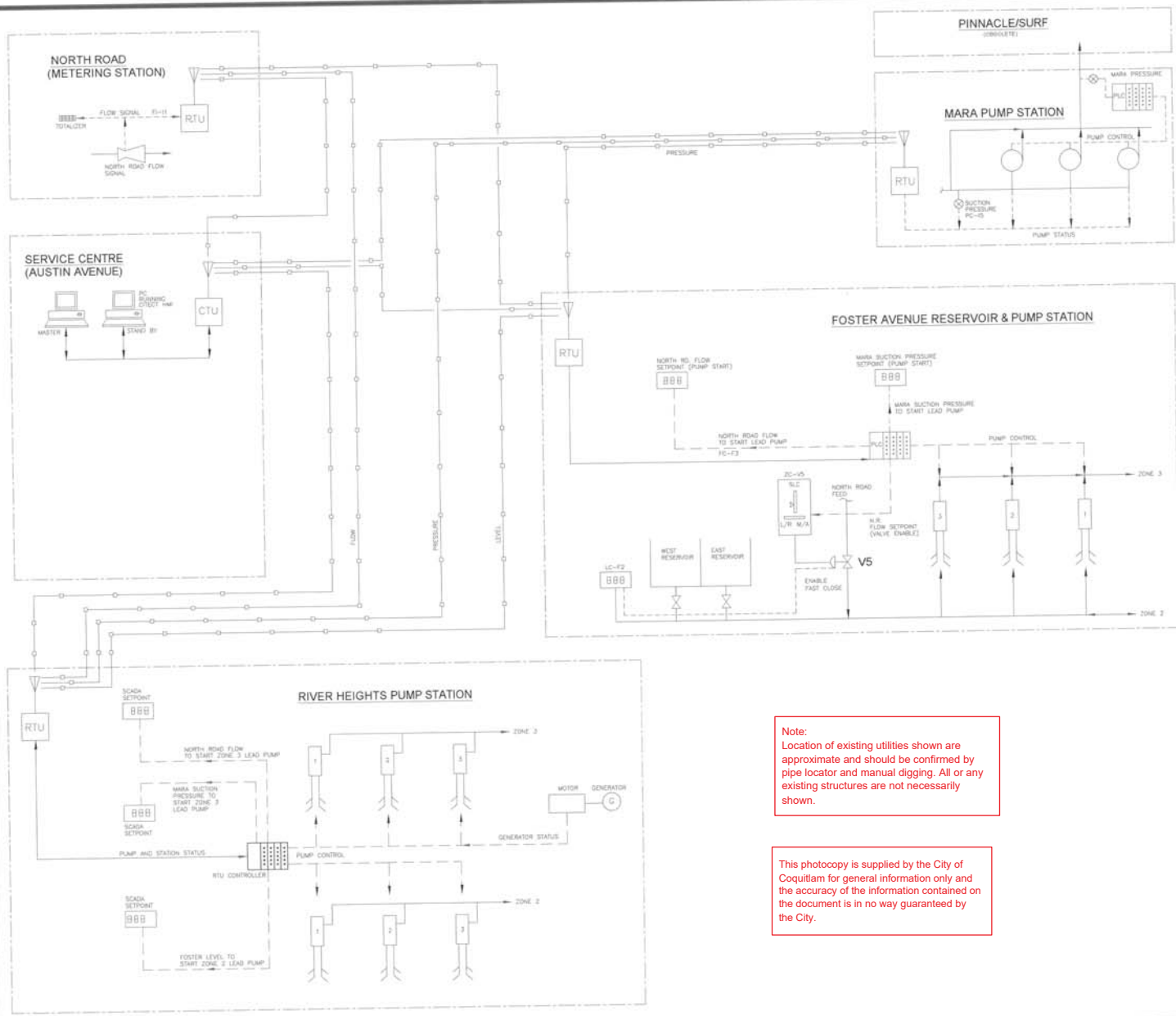
DRAWING LOCATION			
713 (FOSTER)	714 (FOSTER)	715 (FOSTER)	716 (FOSTER)
717 (AL HEIGHTS)	718 (AL HEIGHTS)	719 (AL HEIGHTS)	720 (AL HEIGHTS)

* REFER TO
W1900-01PG W1900-04PG
FOR ADDITIONAL
DRAWINGS AT
THIS LOCATION

NO	DATE	ENG	BY	SUBJECT
3	SEP.12.84	M.L.	S.L.	AS BUILT
2	MAY.25.84	M.L.	S.L.	CONSTRUCTION REVISION
1	NOV.15.83	D.W.	VP	ISSUED FOR TENDER
0	SEPT.24.83	D.W.	D.J.	ISSUED FOR REVIEW
A	MAR.23.83	D.W.	D.J.	PRELIMINARY
REVISIONS				
PROJECT NO. VW42 / 922942				
SCALE N.T.S.				
DRAWN D.J.				
DESIGNED D.W.				
CHECKED				
APPROVED				
DATE MAR.1983				

ASSOCIATED
ENGINEERING

W1703-G	
CITY OF COQUITLAM	
MARA BOOSTER PUMP STATION AND MARA ZONE	
PIPING AND INSTRUMENTATION DIAGRAM (P. & I.D.)	
DRAWING NUMBER	REV. NO. SHEET
VW42-1-718	3



Note:
Location of existing utilities shown are approximate and should be confirmed by pipe locator and manual digging. All or any existing structures are not necessarily shown.

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4	SEP.24.01	CITY	E.M.	REVISION BY N.T.
3	SEP.12.94	M.L.	S.L.	AS BUILT
2	MAY.25.94	M.L.	S.L.	CONSTRUCTION REVISION
1	NOV.15.93	D.W.	V.P.	ISSUED FOR TENDER
0	SEP.24.93	D.W.	D.J.	ISSUED FOR REVIEW
A	MAR.23.93	D.W.	D.J.	PRELIMINARY
NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO. VW42 / 922942				
SCALE: N.T.S.				
DRAWN: D.J.				
DESIGNED: D.W.				
CHECKED:				
APPROVED:				
APPROVED:				
DATE: SEPT. 1993				

ASSOCIATED
ENGINEERING **AE**

COQ. ASBUILT No.:
W1703-H

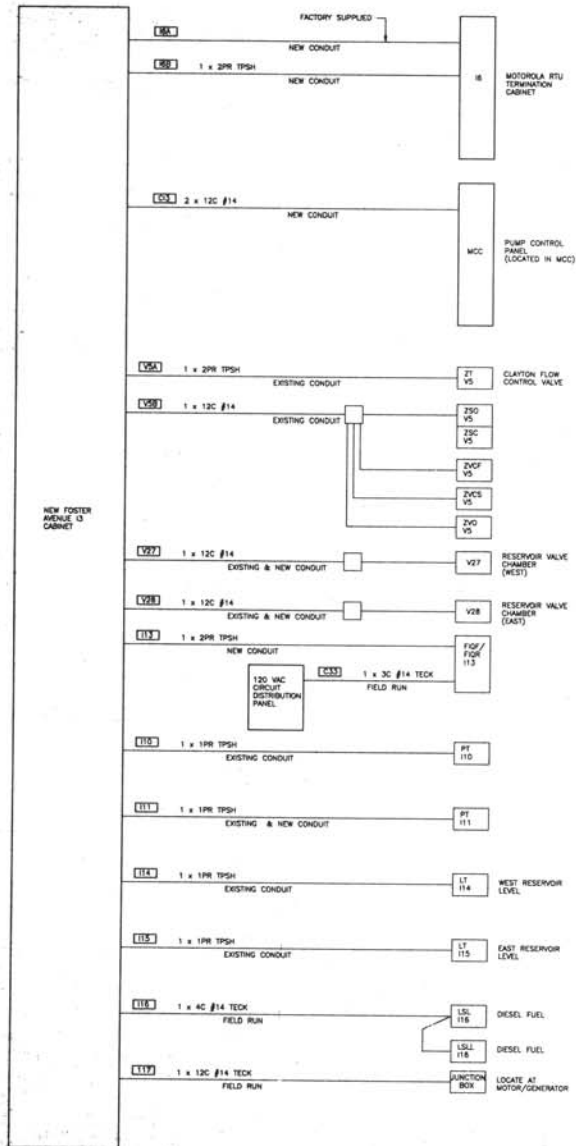
CITY OF COQUITLAM

ZONE 2/3 CONTROL SYSTEM
BLOCK DIAGRAM

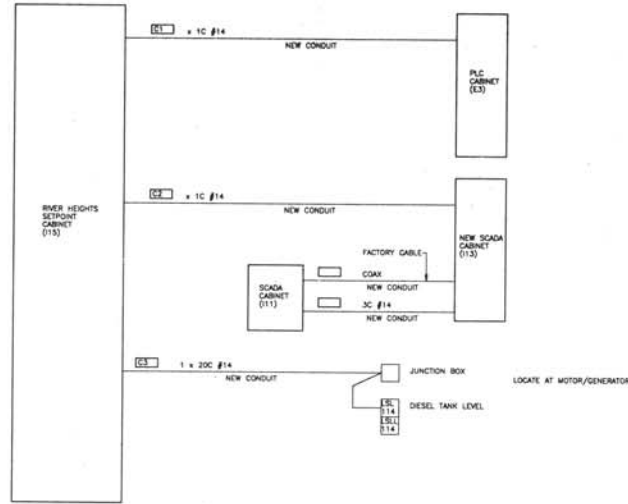
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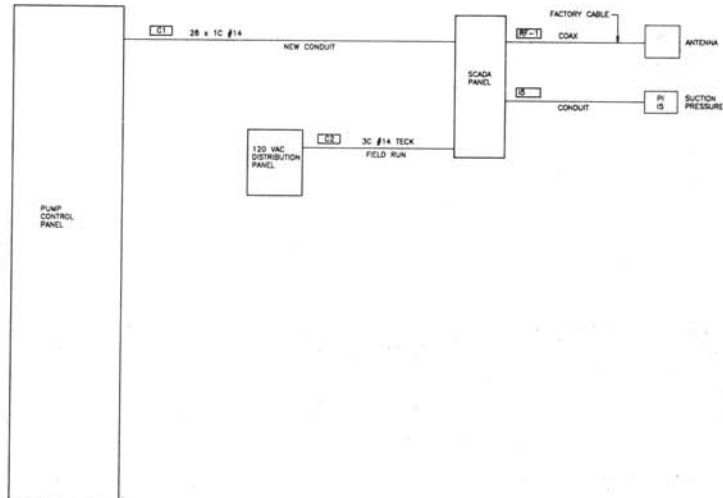
FOSTER AVENUE PUMP STATION



RIVER HEIGHTS PUMP STATION



MARA BOOSTER PUMP STATION



NOTES:

1. AS BUILT INFORMATION IS NOT AVAILABLE.

3	SEP-12-94	M.L.	S.L.	AS DESIGNED
2	MAY-25-94	M.L.	S.L.	CONSTRUCTION REVISION
1	NOV-15-93	D.W.	VP	ISSUED FOR TENDER
0	SEP-24-93	D.W.	D.J.	ISSUED FOR REVIEW
A	MAY-23-93	D.W.	D.J.	PRELIMINARY
NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO. VW42 / 922942				
SCALE: N.T.S.				
DRAWN: D.J.				
DESIGNED: D.W.				
CHECKED:				
APPROVED:				
DATE: SEPT. 1993				

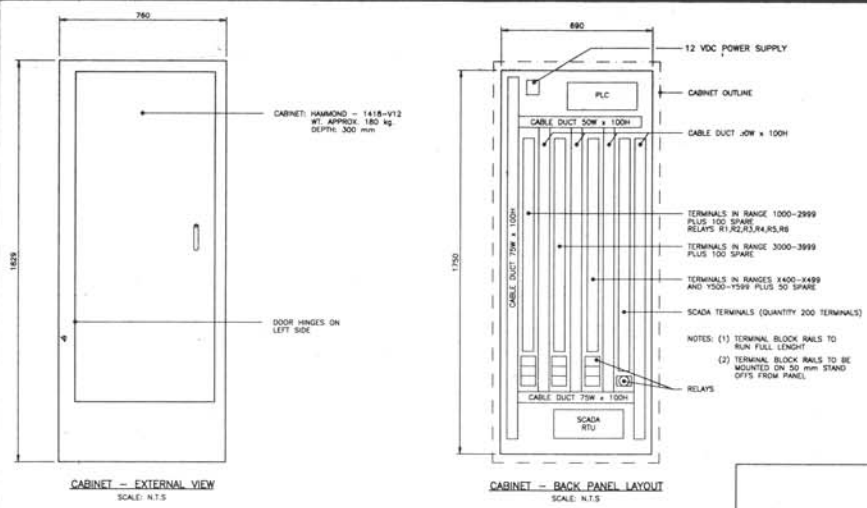
ASSOCIATED ENGINEERING **AE**

W1703-1

CITY OF COQUITLAM

WIRING INTERCONNECTION
FOSTER AVENUE RESERVOIR
AND PUMP STATION

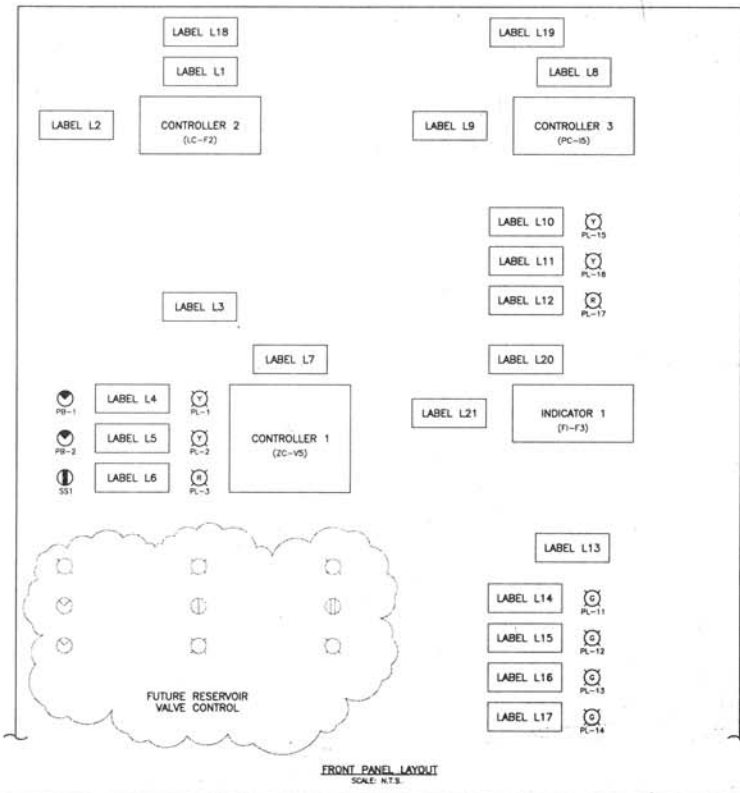
DRAWING NUMBER	REV. NO.	SHEET
VW42-1-730	3	3



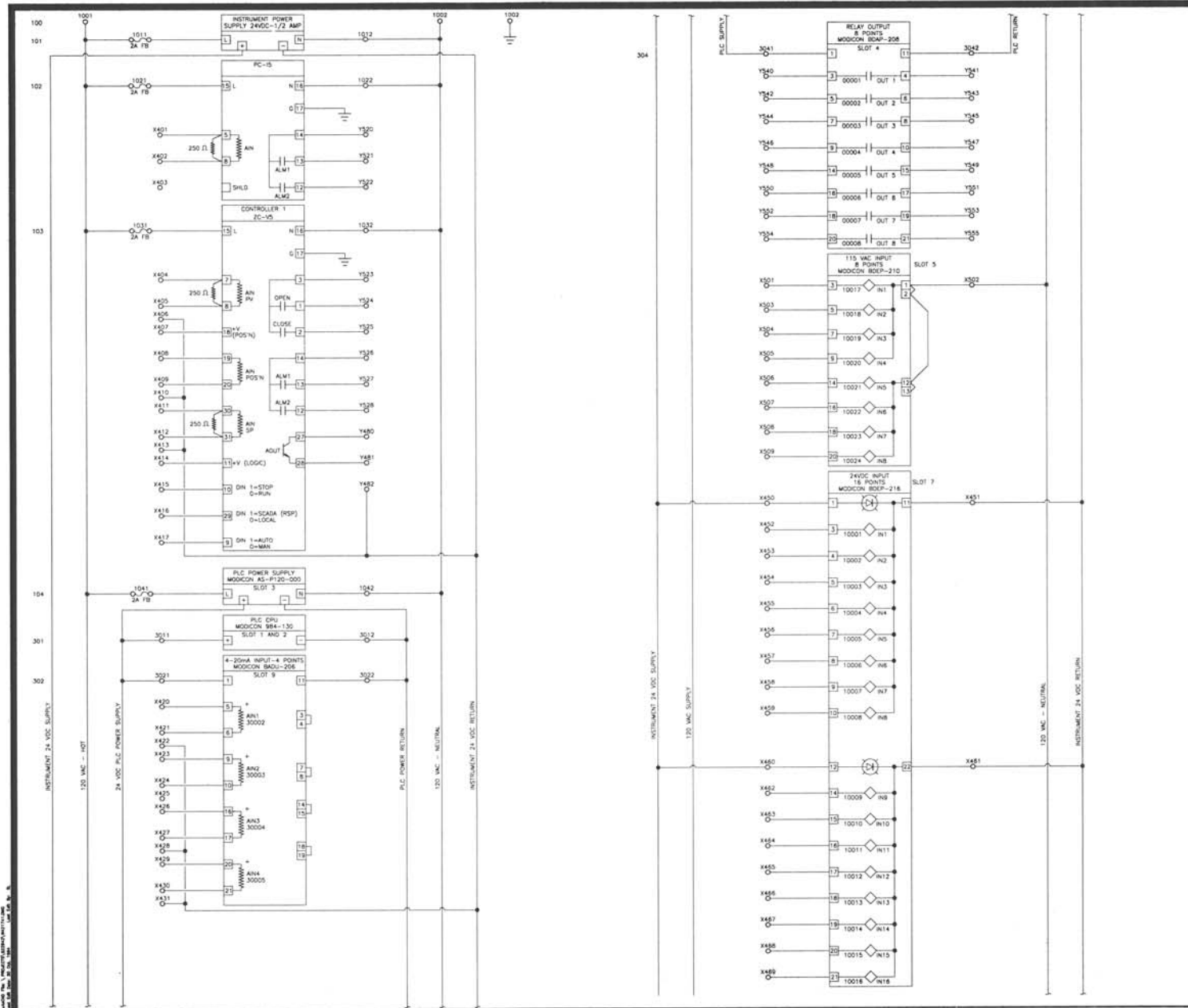
** OBSOLETE
* SUPERSEDED BY
W1899-06 PE*

LABEL SCHEDULE

LABEL No.	SIZE (mm)			TEXT		
	HEIGHT	WIDTH	LETTER	LINE 1	LINE 2	JUSTIFICATION
L1	30	80	8	FOSTER	RESERVOIR LEVEL	CENTER
L2	20	80	4	STOP NORTH ROAD FEED	START NORTH ROAD FEED	RIGHT
L3	30	80	8	NORTH ROAD	FEED FLOW	CENTER
L4	30	80	8	SCADA AUTO	CONTROL	CENTER
L5	30	80	8	LOCAL MANUAL	CONTROL	CENTER
L6	30	80	8	CLOSE FLOW	VALVE	CENTER
L7	30	80	8	NORTH ROAD FLOW	CONTROLLER	CENTER
L8	30	80	8	MARA	PRESSURE	CENTER
L9	20	80	4	STOP FOSTER PUMPS	START FOSTER PUMPS	RIGHT
L10	20	80	4	SCADA CONTROL	ENABLED	CENTER
L11	20	80	4	RIVER HTS. LEAD	PUMP RUNNING	CENTER
L12	20	80	4	RIVER HTS. LAG	PUMP RUNNING	CENTER
L13	30	80	8	SCADA COMM.	STATUS	CENTER
L14	20	80	4	WORKS YARD	COMM. GOOD	CENTER
L15	20	80	4	RIVER HEIGHTS	COMM. GOOD	CENTER
L16	20	80	4	NORTH ROAD	COMM. GOOD	CENTER
L17	20	80	4	ZONE 3 MARA	COMM. GOOD	CENTER
L18	30	90	12	ZONE 2		CENTER
L19	30	90	12	ZONE 3		CENTER
L20	30	80	8	ZONE 3 LEAD PUMP	START SETPOINT	CENTER
L21	30	80	8	SCADA FLOW	SETPOINT	CENTER



3	SEP 12/94	M.L.	S.L.	AS BUILT
2	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
1	93/11/05	D.W.	VP	ISSUED FOR TENDER
0	93/09/03	D.W.	D.J.	ISSUED FOR REVIEW
3	93/07/28	D.W.	J.B.M.	PRELIMINARY
NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO.		VW42 / 922942		
SCALE		AS NOTED		
DRAWN		J.B.M.		
DESIGNED		D.W.		
CHECKED				
APPROVED				
DATE		JULY, 1993		
ASSOCIATED ENGINEERING				
W1703-J				
CITY OF COQUITLAM				
ZONE 2 AND ZONE 3				
FOSTER AVENUE PUMP STATION 13 CABINET				
DRAWING NUMBER		REV. NO.		SHEET
VW42-1-740		3		3



NO	DATE	ENG	BY	SUBJECT
5	SEP 12/94	M.L.	S.L.	AS BUILT
4	JUN 09/94	M.L.	S.L.	CONSTRUCTION REVISION
3	JUN 03/94	M.L.	S.L.	CONSTRUCTION REVISION
2	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
1	93/11/15	D.W.	VP	ISSUED FOR TENDER
0	93/09/23	D.W.	D.J.	ISSUED FOR REVIEW
A	93/07/20	D.W.	J.B.M.	PRELIMINARY

PROJECT NO.	VW42 / 922942
SCALE	N/A
DRAWN	J.B.M.
DESIGNED	D.W.
CHECKED	
APPROVED	
DATE	JULY, 1993

ASSOCIATED ENGINEERING

W1703-K

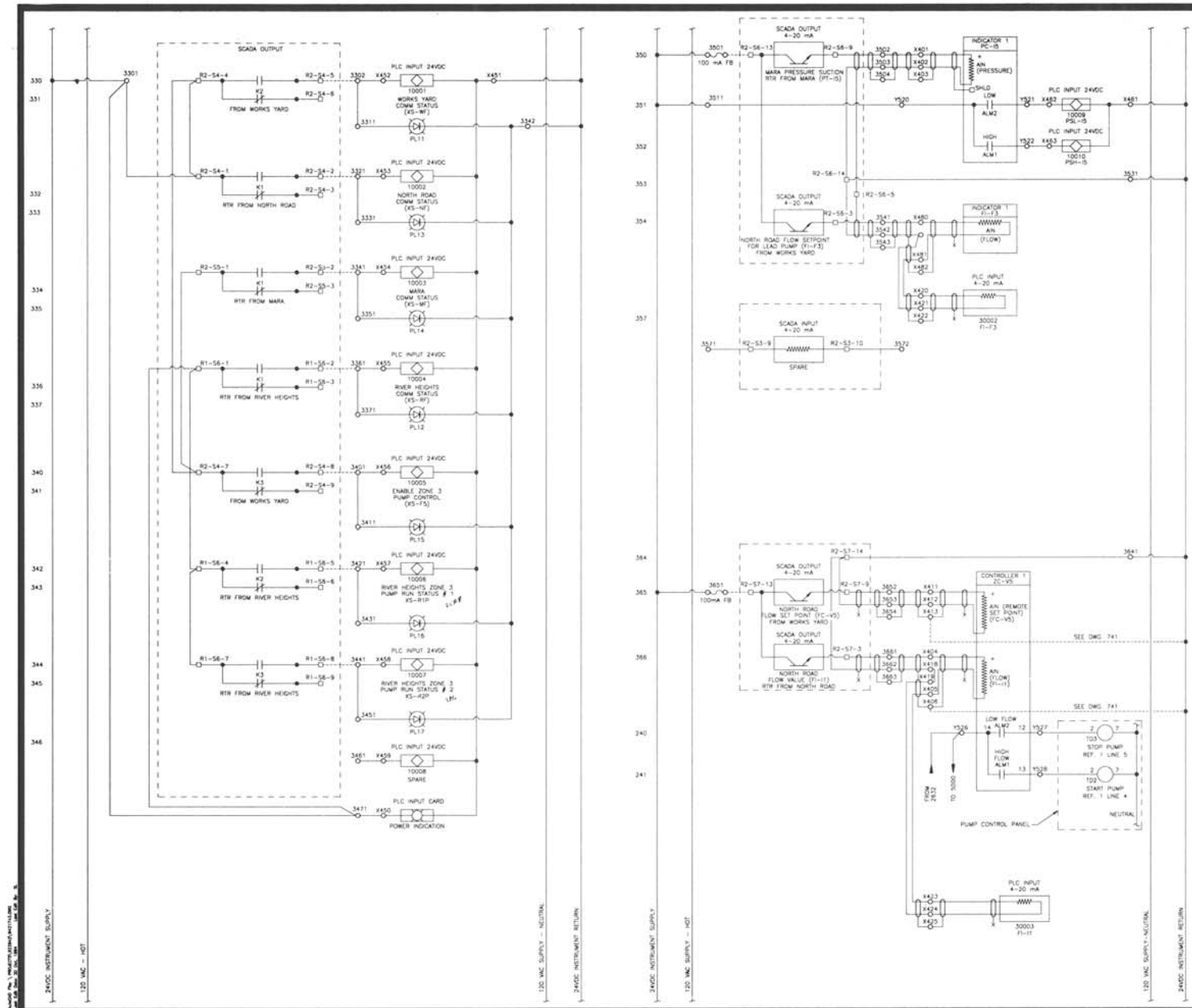
CITY OF COQUITLAM

ZONE 2 AND ZONE 3

FOSTER AVENUE PUMP STATION
13 CABINET

DRAWING NUMBER	REV NO.	SHEET
VW42-1-741	5	





REV	DATE	BY	REV	TITLE
1	1.06.10.01		A	FOSTER AVENUE PUMP STATION CONTROL (PANEL WIRING SCHEMATIC)

***OBSOLETE
*SUPERSEDED BY
W1599-08 PE**

NO	DATE	ENG	BY	SUBJECT
3	SEP 12/94	M.L.	S.L.	AS BUILT
4	JUN 08/94	M.L.	S.L.	CONSTRUCTION REVISION
5	JUN 03/94	M.L.	S.L.	CONSTRUCTION REVISION
2	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
1	93/11/15	D.W.	V.P.	ISSUED FOR TENDER
0	93/09/24	D.W.	D.J.	ISSUED FOR REVIEW
A	93/07/20	D.W.	J.B.M.	PRELIMINARY

REVISIONS

PROJECT NO.	SCALE	DRAWN	DESIGNED	CHECKED	APPROVED	DATE
VM42 / 922942	N/A	J.B.M.	D.W.			JULY 1993

ASSOCIATED ENGINEERING

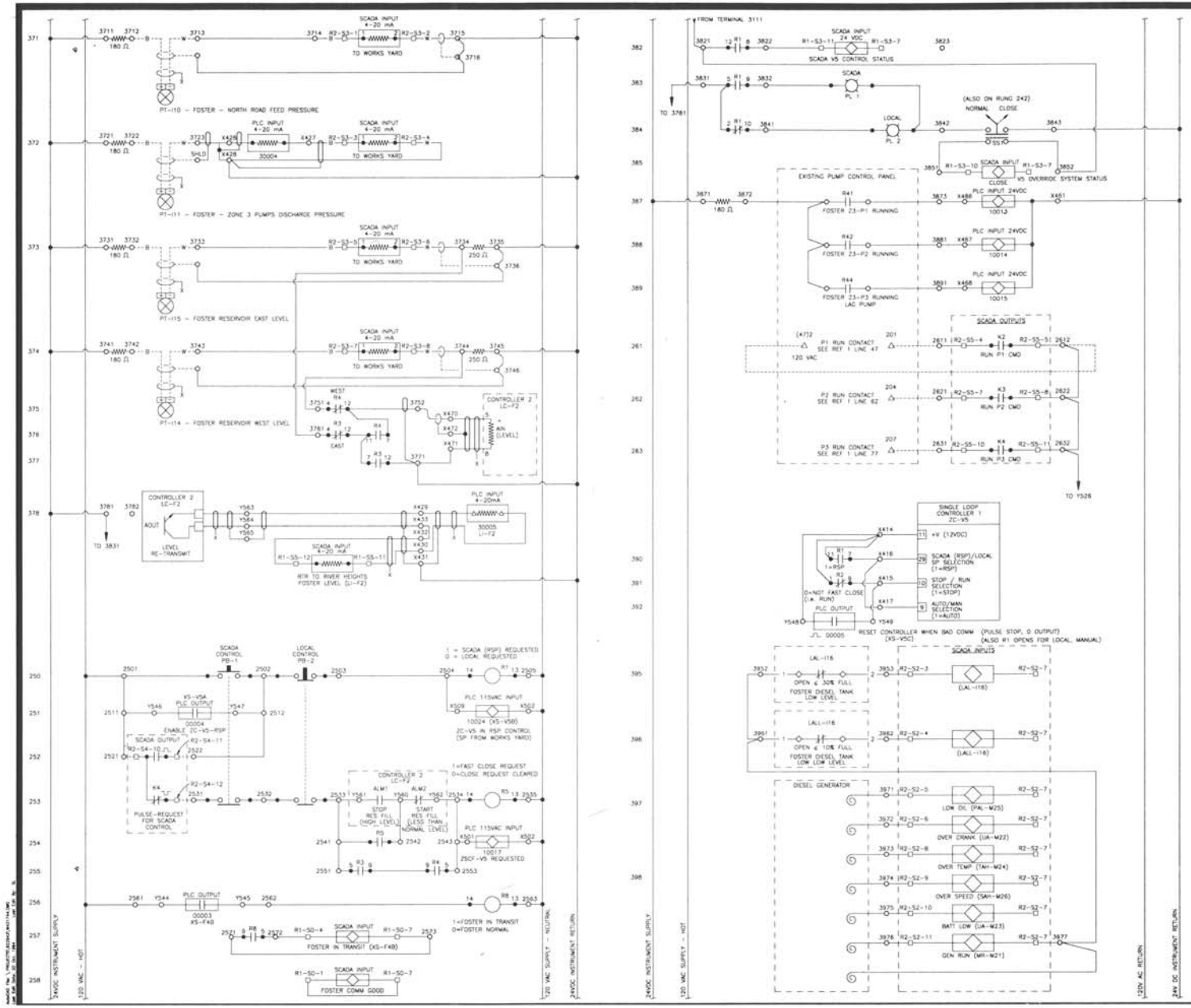
W1703-M

CITY OF COQUITLAM

**ZONE 2 AND ZONE 3
WIRING SCHEMATIC**

**FOSTER AVENUE PUMP STATION
13 CABINET**

DRAWING NUMBER	REV NO.	SHEET
VM42-1-743	5	



*** OBSOLETE
* SUPERSEDED
BY W1599-091**

3	SEP 12/94	M.L.	S.L.	AD INLT
4	JUN 28/94	M.L.	S.L.	CONSTRUCTION REVISION
5	JUN 28/94	M.L.	S.L.	CONSTRUCTION REVISION
6	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
7	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
8	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
9	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
10	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
11	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
12	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
13	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
14	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
15	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
16	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
17	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
18	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
19	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
20	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
21	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
22	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
23	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
24	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
25	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
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30	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
31	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
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65	MAY 25/94	M.L.	S.L.	CONSTRUCTION REVISION
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**ASSOCIATED
ENGINEERING**

W1703-N

CITY OF COQUITLAM

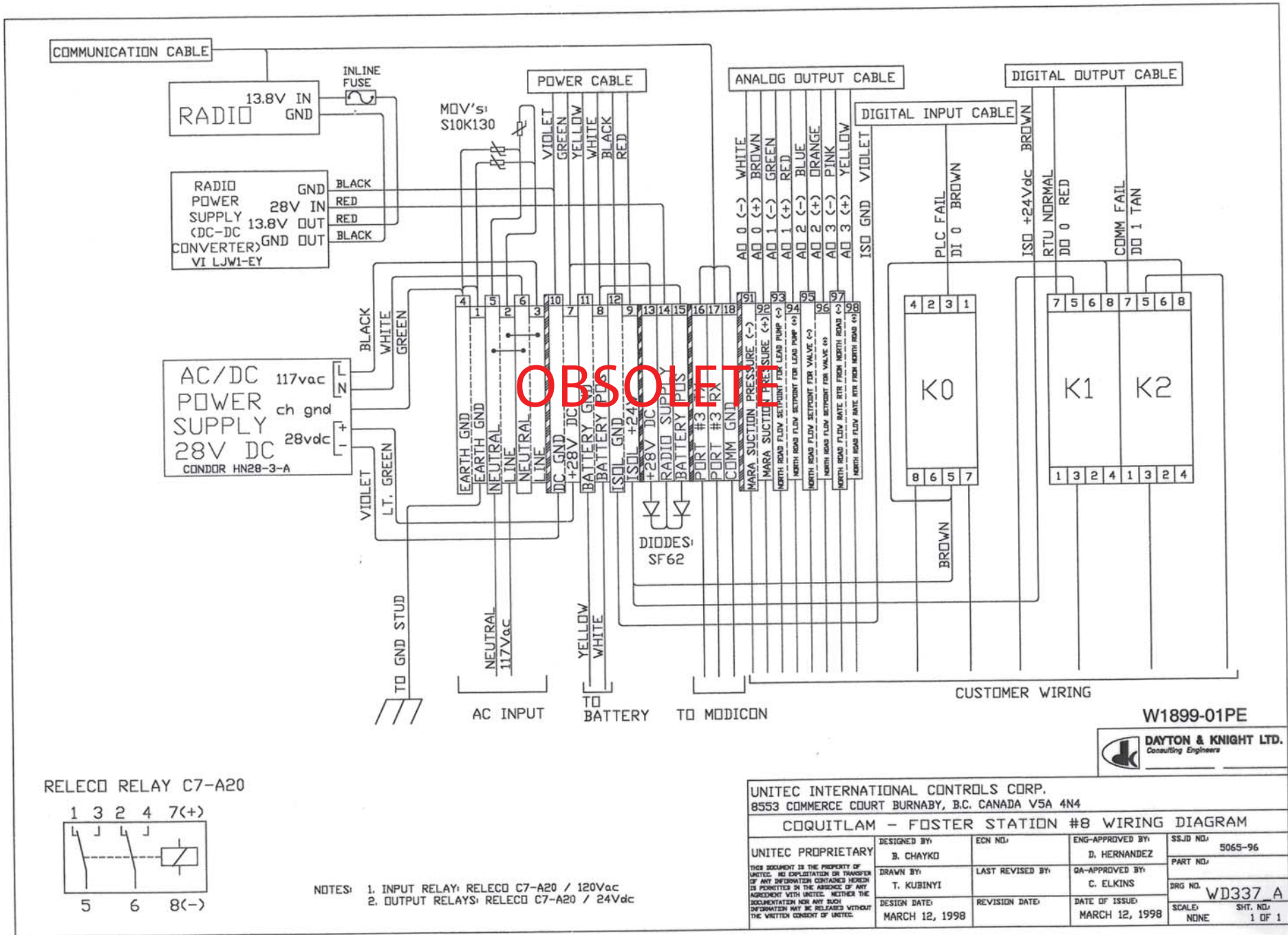
**ZONE 2 AND ZONE 3
WIRING SCHEMATIC**

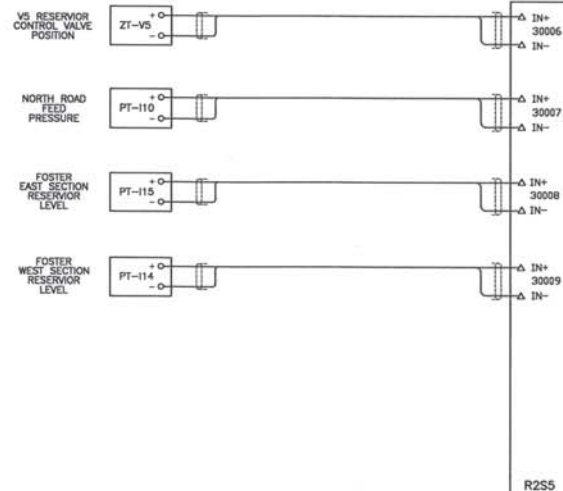
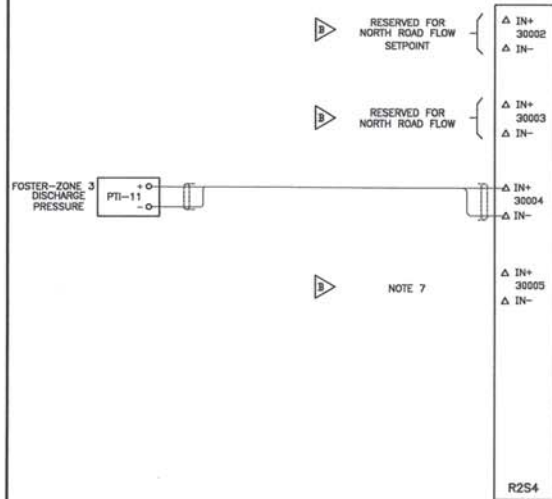
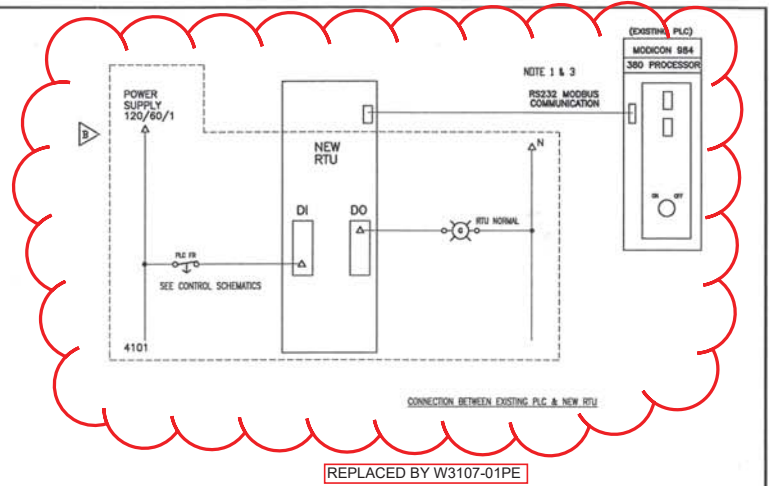
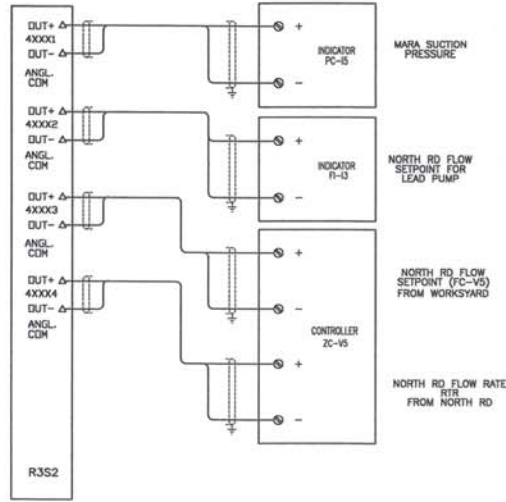
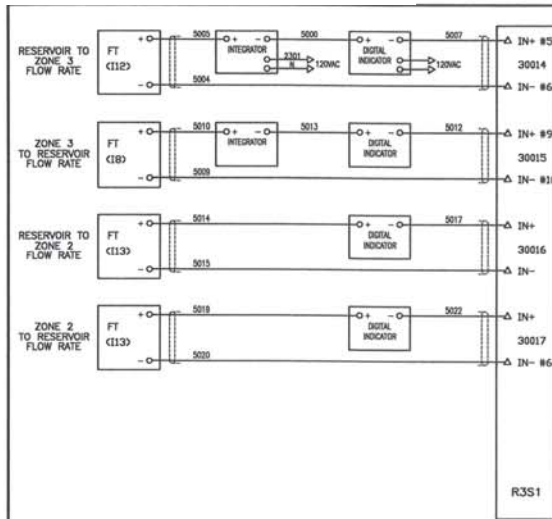
**FOSTER AVENUE PUMP STATION
13 CABINET**

DRAWING NUMBER	REV NO.	SHEET
VW42-1-744	5	



DRAWING NUMBER	REV NO.	SHEET
VW42-1-745	4	/





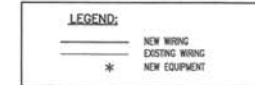
NOTE 4

130 PROCESSOR	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	

PLC LAYOUT - BACK 1, 2 & 3

NOTES:

1. CONNECT EXISTING MODICON PLC WITH NEW RTU FOR SCADA COMMUNICATION.
2. * NEW EQUIPMENT *
3. NEW RTU SHALL TRANSFER AND RECEIVE PLC'S DATA REGISTERS THROUGH MODBUS COMMUNICATION. CABLE LENGTH TO BE LESS THAN 50 FEET.
4. NEW MODICON MODEL 07A-202 SUB-RACK ADDED REV.C
5. REFER TO DWG. 138-348A FOR DISCRETE INPUT/OUTPUT. RS-232 REPEATER SHALL BE INSTALLED IF GREATER LENGTH IS REQUIRED.
6. FLOW TOTALIZATION ACHIEVED THROUGH INTERNAL CALCULATIONS.
7. REMOVE EXISTING WIRING TO IN 30005 (RE-TRANSMITTED FOSTER RESERVOIR LEVEL).

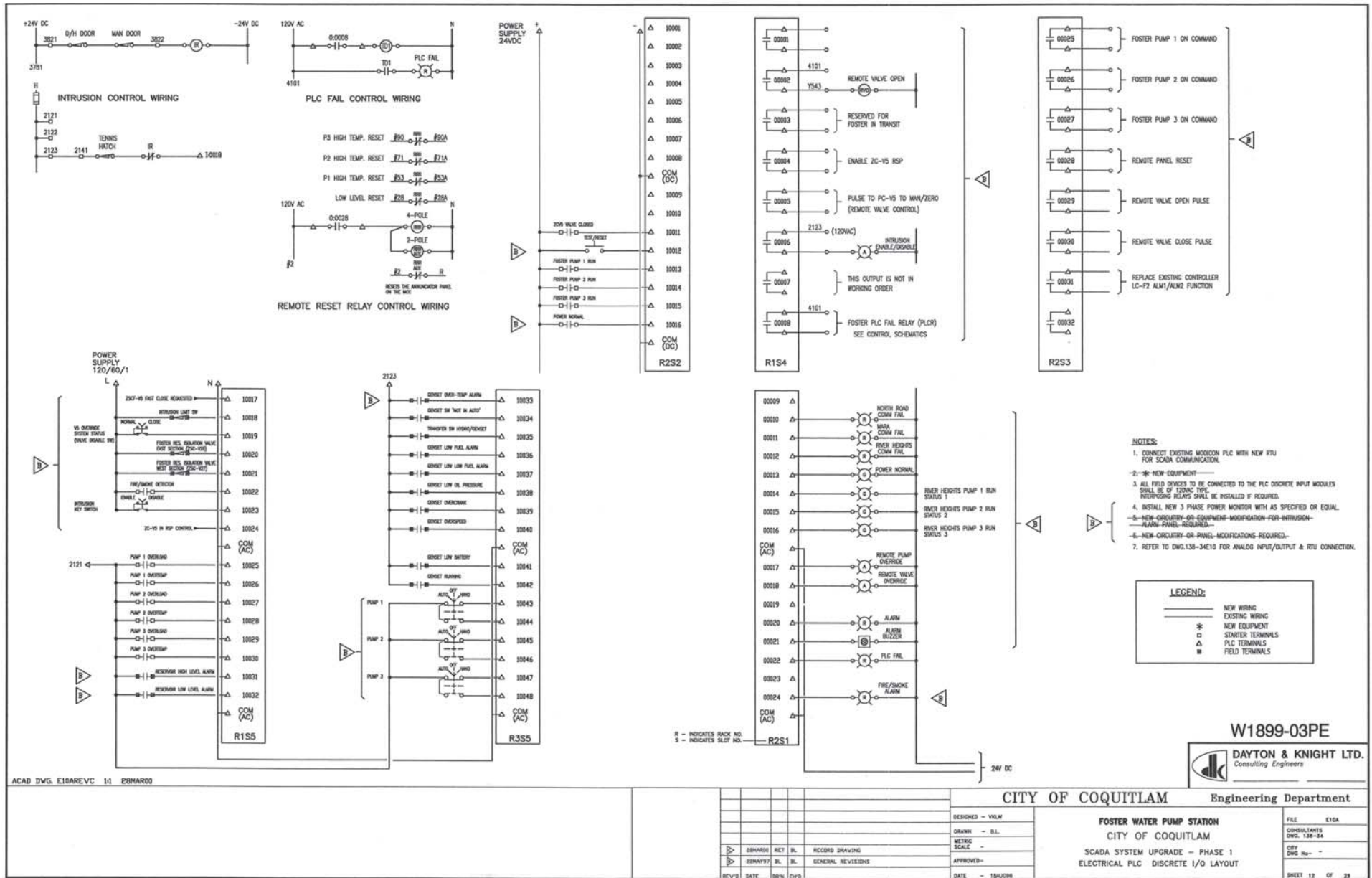


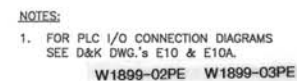
W1899-02PE



ACAD DWG. E10 REV.C 14 27MAR00

CITY OF COQUITLAM				Engineering Department	
<p>DESIGNED - VHW</p> <p>DRAWN - B.L.</p> <p>METRIC SCALE -</p> <p>APPROVED -</p> <p>DATE - 18AUG98</p>				<p>FOSTER WATER PUMP STATION</p> <p>CITY OF COQUITLAM</p> <p>SCADA SYSTEM UPGRADE - PHASE 1</p> <p>ELECTRICAL PLC ANALOG I/O LAYOUT & RTU CONNECTION</p>	
<p>REV'S DATE BYN DATE</p> <p>1 27MAR00 B.L. RECORD DRAWING</p> <p>2 20MAY97 B.L. GENERAL REVISIONS</p>				<p>FILE E10</p> <p>COORDINATORS</p> <p>DWG. 138-34</p> <p>CITY</p> <p>DWG No -</p> <p>SHEET 11 OF 29</p>	





DAYTON & KNIGHT LTD.
Consulting Engineers

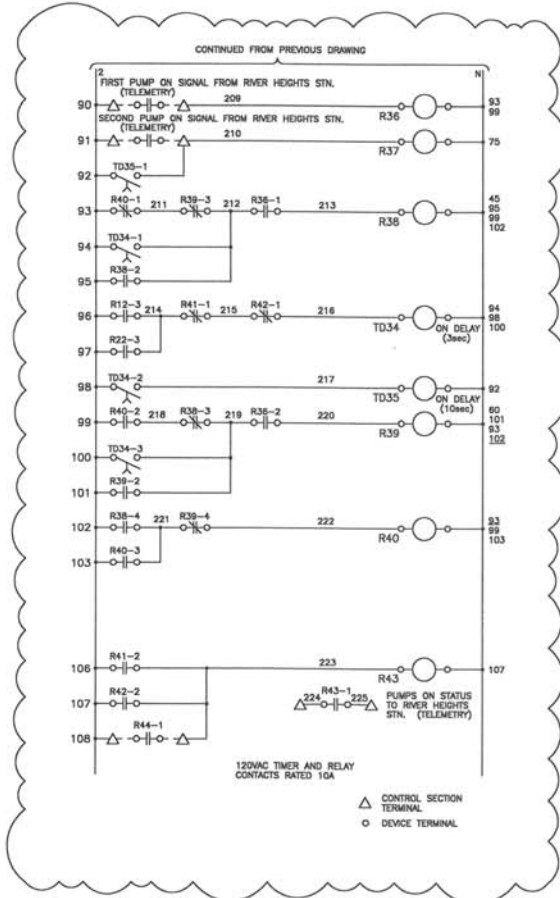
CONTINUED ON NEXT DRAWING

Engineering Department

**FOSTER WATER PUMP STATION
CITY OF COQUITLAM
SCADA SYSTEM UPGRADE - PHASE 1
ELECTRICAL - MCC CONTROL SECTION
ON MEZZANINE FLOOR**

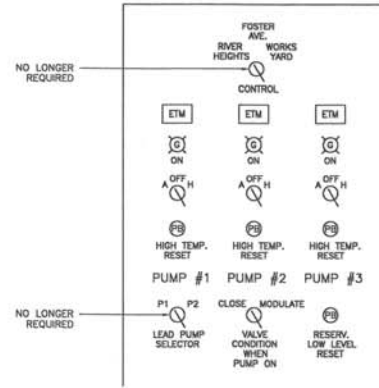
FILE	10E1
CONSULTANTS	DWG. 138-34 (WAS 138.100)
CITY	
DWG No-	-
SHEET	1 OF 2

				CONTINUED ON NEXT DRAWING	
				CITY	
				DESIGNED - L.R.	
				DRAWN - L.R./S.L.	
				METRIC SCALE -	
S	2794005	RET	BL	MODIFIED TO SUIT NEW RTU INSTALLATION	
C	SCP/01	V3	V9	RECORD DRAWING	
				APPROVED -	
REV'S	DATE	BY	CHK	DATE - JULY '98	

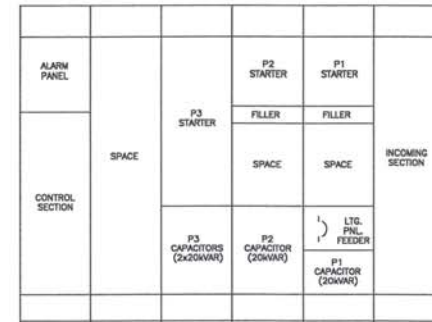


THIS WIRING NO LONGER APPLIES.
CONTROL REPLACED BY PLC PROGRAM.
FOR PLC I/O CONNECTION DIAGRAMS SEE D&K DWG.'s E10 & E10A

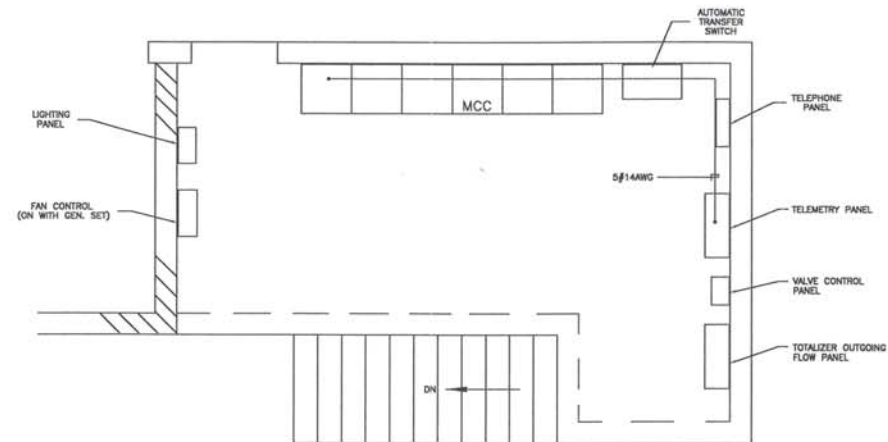
W1899-02PE W1899-03PE



CONTROL SECTION DOOR LAYOUT
NTS



MCC FRONT ELEVATION
NTS



MEZZANINE EL. EQUIPMENT LAYOUT

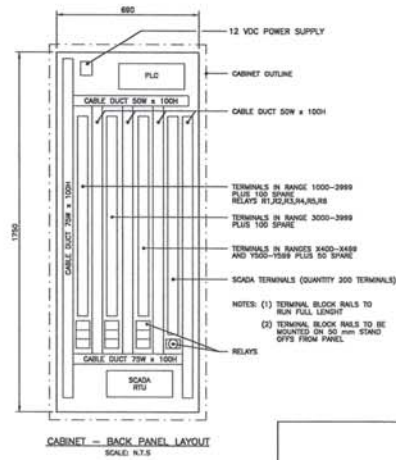
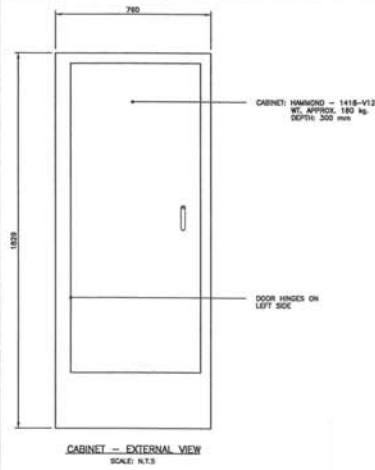
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W1899-05PE



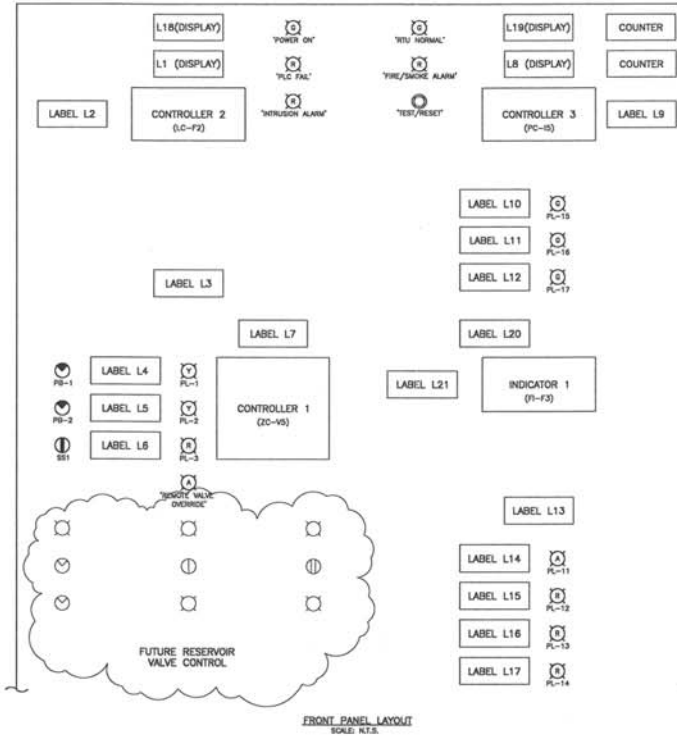
ACAD DWG. 10E2REV'D 14 27MAR00

CITY OF COQUITLAM				Engineering Department	
DESIGNED - LK	DRWN - LK / RL	METRIC SCALE -	APPROVED -	FOSTER WATER PUMP STATION CITY OF COQUITLAM SCADA SYSTEM UPGRADE - PHASE 1 ELECTRICAL - MCC CONTROL SECTION ON MEZZANINE FLOOR	
DATE - JULY 98	REVISED DATE	REVISED BY	REVISED BY		
NOV 98	NOV 98	NOV 98	NOV 98		
NOV 98	NOV 98	NOV 98	NOV 98		
MODIFIED TO SUIT NEW RTU INSTALLATION RECORD DRAWING				FILE 10E2 CONSULTANTS DWG. 138-34 (WAS 138.10E) CITY DWG NO - SHEET 2 OF 2	



LABEL SCHEDULE

LABEL No.	SIZE (mm)			TEXT		
	HEIGHT	WIDTH	LETTER	LINE 1	LINE 2	JUSTIFICATION
L1	30	60	8	FOSTER ZONE 2	DIGITAL DISPLAY	CENTER
L2	30	60	4	STOP NORTH ROAD FEED	START NORTH ROAD FEED	RIGHT
L3	30	60	8	NORTH ROAD	FEED FLOW	CENTER
L4	30	60	8	SCADA AUTO	CONTROL	CENTER
L5	30	60	8	LOCAL MANUAL	CONTROL	CENTER
L6	30	60	8	CLOSE FLOW	VALVE	CENTER
L7	30	60	8	NORTH ROAD FLOW	CONTROLLER	CENTER
L8	30	60	8	NANA ZONE 3	DIGITAL DISPLAY	CENTER
L9	30	60	4	STOP FOSTER PUMPS	START FOSTER PUMPS	RIGHT
L10	20	60	4	SCADA CONTROL	ENABLED	CENTER
L11	20	60	4	RIVER HTS. LEAD	PUMP RUNNING	CENTER
L12	20	60	4	RIVER HTS. LAG	PUMP RUNNING	CENTER
L13	30	60	8	SCADA COMM.	STATUS	CENTER
L14	20	60	4	REMOTE PUMP	OVERSIC	CENTER
L15	20	60	4	RIVER HEIGHTS	COMM. FAIL	CENTER
L16	20	60	4	NORTH ROAD	COMM. FAIL	CENTER
L17	20	60	4	ZONE 3 NANA	COMM. FAIL	CENTER
L18	30	60	12	ZONE 2	DIGITAL DISPLAY	CENTER
L19	30	60	12	ZONE 3	DIGITAL DISPLAY	CENTER
L20	30	60	8	ZONE 3 LEAD PUMP	START SETPOINT	CENTER
L21	30	60	8	SCADA FLOW	SETPOINT	CENTER



4	WAB.25.00	RET	BLJ	RECORD DRAWING, NEW RTU
3	SEP.15.94	W.L.	S.L.	AS BUILT
2	WAB.25.04	W.L.	T.L.	CONSTRUCTION REVISION
1	NOV.11/93	D.W.	VP	ISSUED FOR TENDER
5	SEP.08/23	D.W.	S.A.	ISSUED FOR REVIEW
3	NOV.07/28	D.W.	J.B.M.	PRELIMINARY
NO	DATE	ENG	BY	SUBJECT
REVISIONS				
PROJECT NO. VW42 / 822942				
SCALE AS NOTED				
DRAWN J.B.M.				
DESIGNED D.W.				
CHECKED				
APPROVED				
DATE JULY, 1993				

ASSOCIATED ENGINEERING **AE**

W1899-06PE

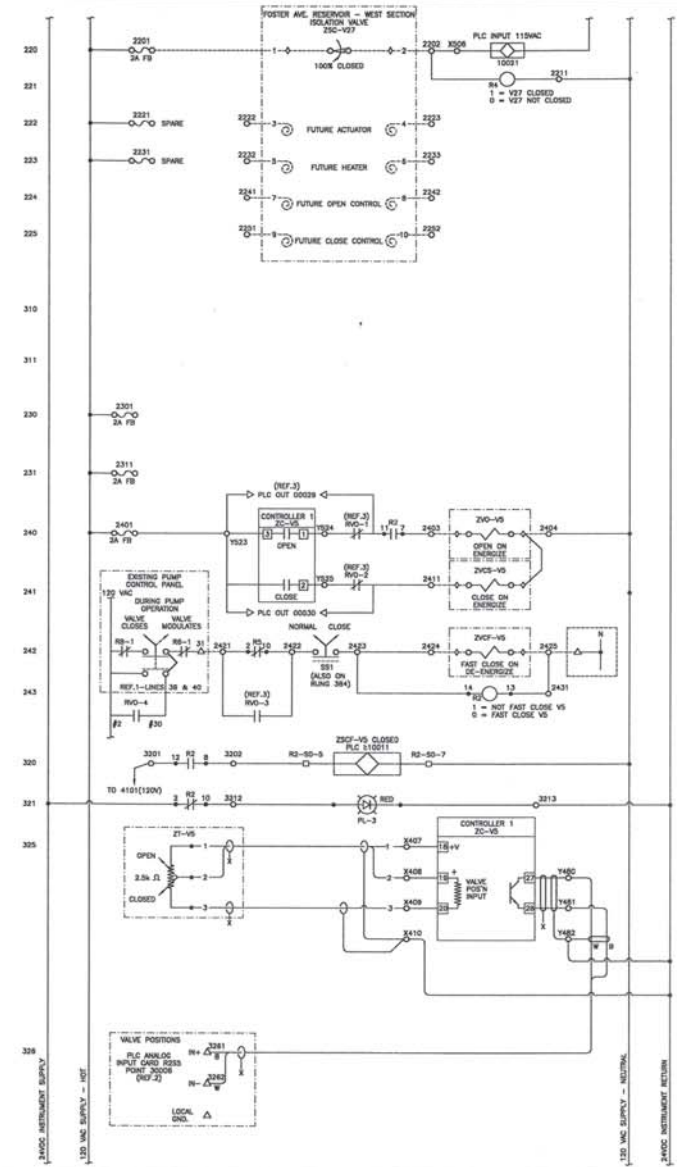
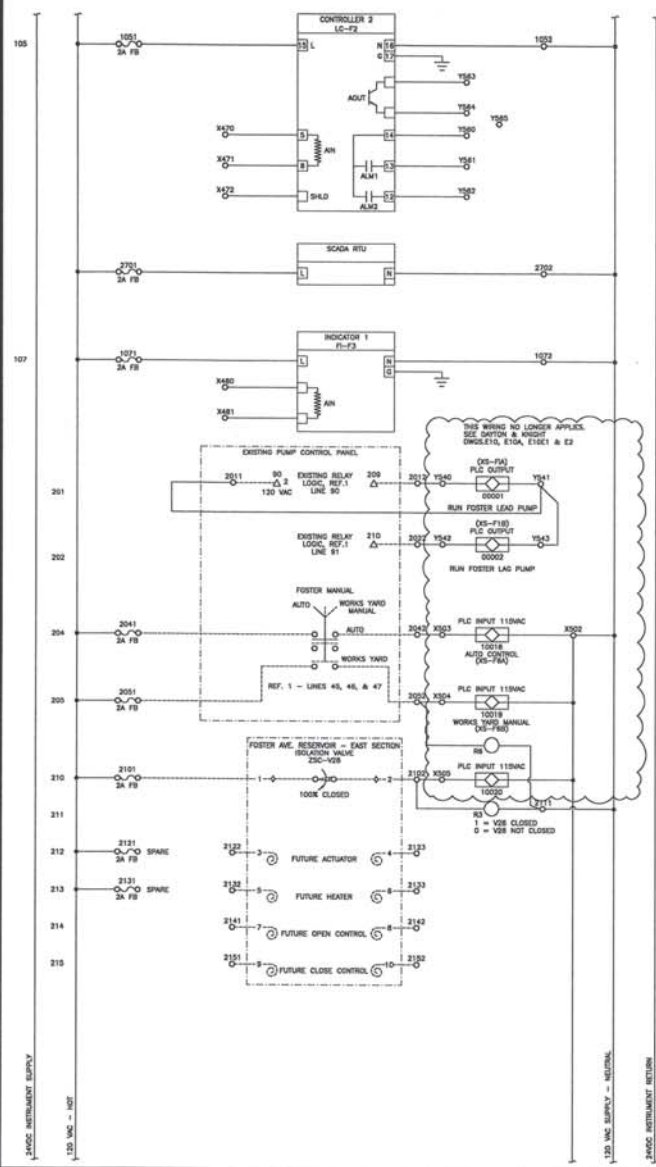
CITY OF COQUITLAM

ZONE 2 AND ZONE 3

FOSTER AVENUE PUMP STATION
13 CABINET

DRAWING NUMBER	REV NO.	SHEET
VW42-1-740	4	

C18



REV.	DATE	BY	REV.	TITLE
1	138-10E1 & E2	D		FOSTER AVENUE PUMP STATION CONTROL (PANEL WIRING SCHEMATIC)
2	138-34-E10	C		FOSTER AVENUE PUMP SOGA SYSTEM UPGRADE--PL-1 PLC I/O CONNECTIONS/ANALOG
3	138-34-E10A	C		FOSTER AVENUE PUMP SOGA SYSTEM UPGRADE--PL-1 PLC I/O CONNECTIONS

NO.	DATE	END	BY	SUBJECT
1	8/11/15			ISSUED FOR TENDER
2	8/11/15			ISSUED FOR REVIEW
3	8/11/15			ISSUED FOR REVIEW
4	8/11/15			ISSUED FOR REVIEW
5	8/11/15			ISSUED FOR REVIEW
6	8/11/15			ISSUED FOR REVIEW
7	8/11/15			ISSUED FOR REVIEW
8	8/11/15			ISSUED FOR REVIEW
9	8/11/15			ISSUED FOR REVIEW
10	8/11/15			ISSUED FOR REVIEW

PROJECT NO.	SCALE	DRAWN	CHECKED	APPROVED	DATE
VW42 / 822942	N/A	J.B.M.	D.M.		JULY 1993

ASSOCIATED ENGINEERING

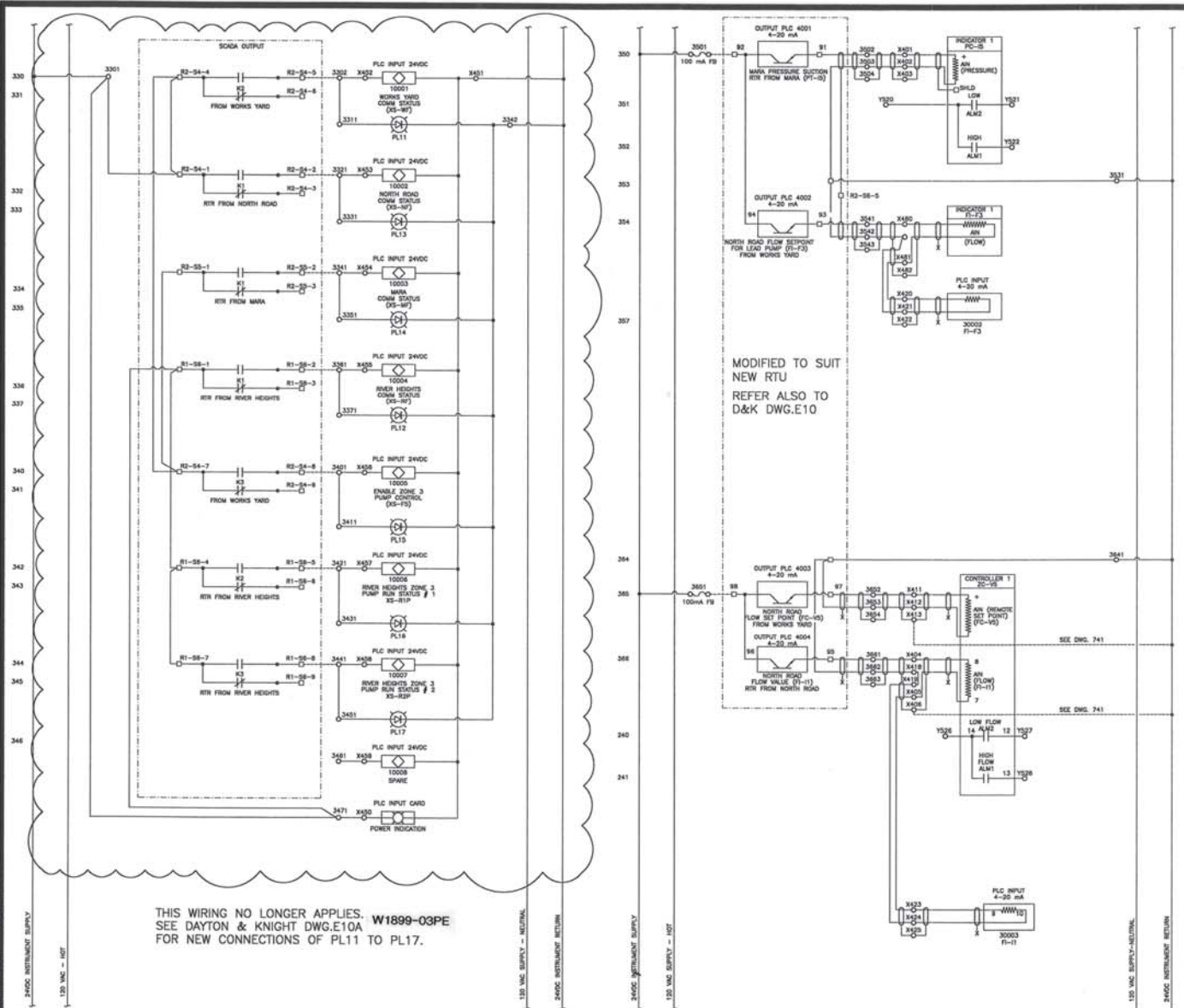
W1899-07PE

CITY OF COQUITLAM

ZONE 2 AND ZONE 3 WIRING SCHEMATIC

FOSTER AVENUE PUMP STATION 13 CABINET

DRAWING NUMBER	REV. NO.	SHEET
VW42-1-742	6	



REV.	DATE	BY	REASON
1	13B.10E1	A	FOSTER AVENUE PUMP STATION CONTROL PANEL WIRING SCHEMATIC
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PROJECT NO. VW42 / 822943

SCALE N/A

DRAWN J.M.M.

DESIGNED D.W.

CHECKED

APPROVED

DATE JULY 1993

ASSOCIATED ENGINEERING **AE**

W1899-08PE

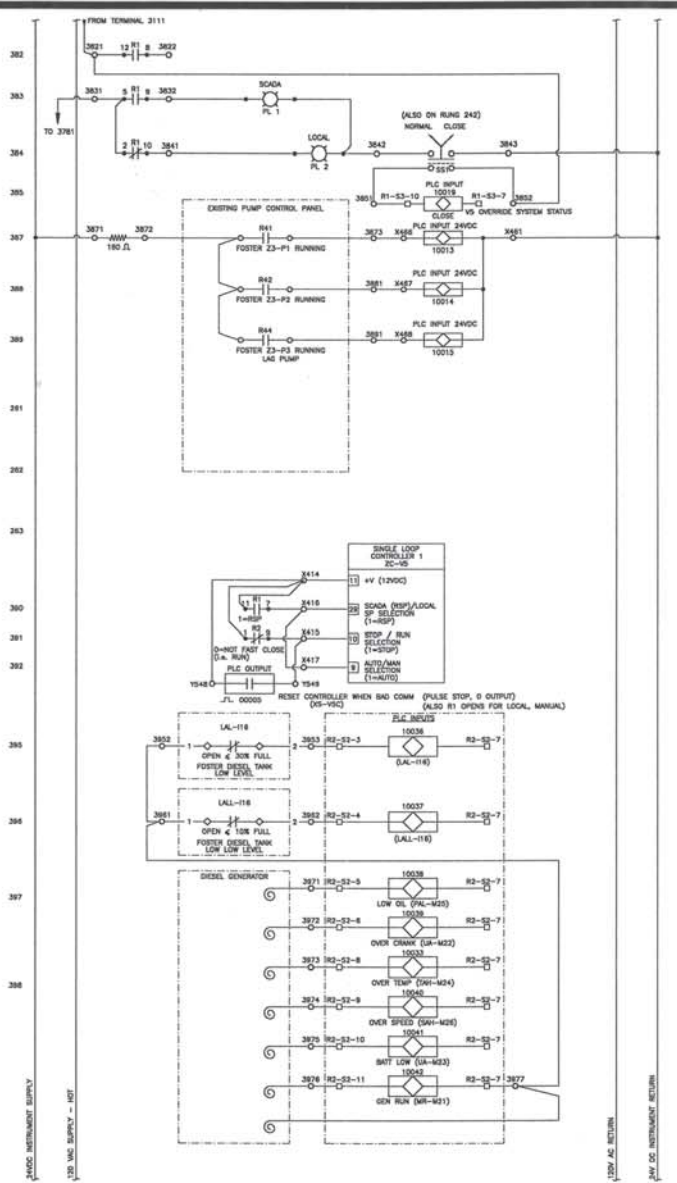
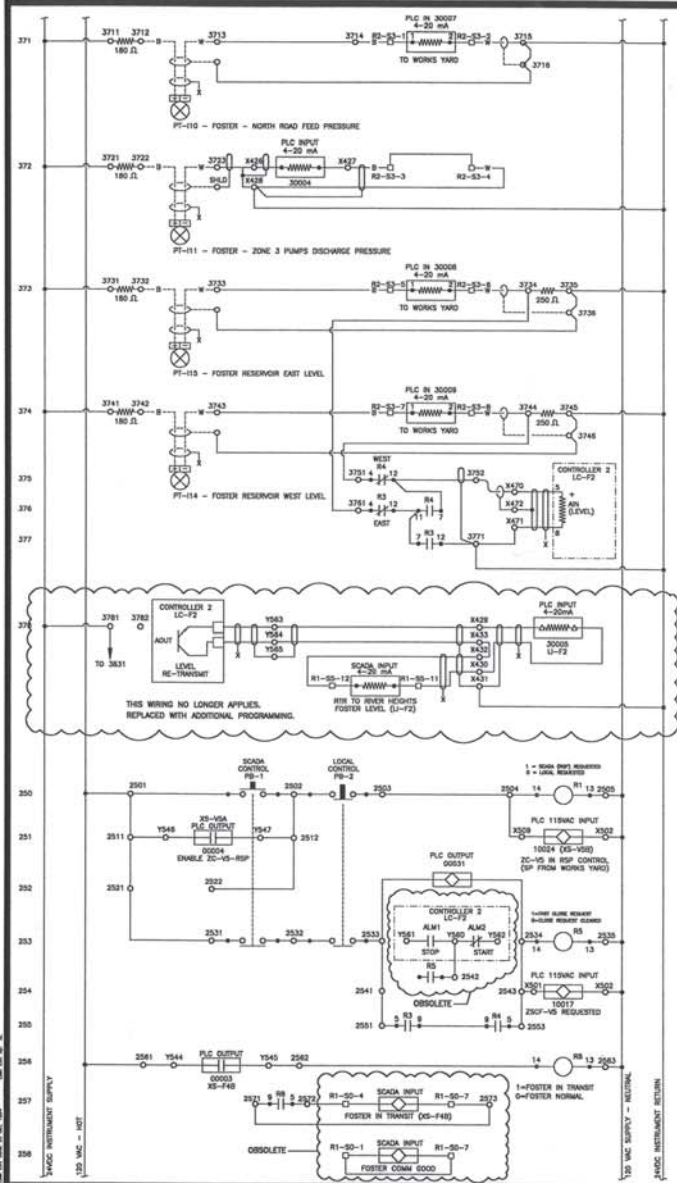
CITY OF COQUITLAM

ZONE 2 AND ZONE 3
WIRING SCHEMATIC

FOSTER AVENUE PUMP STATION
13 CABINET

DRAWING NUMBER	REV. NO.	SHEET
VW42-1-743	6	

610



REV.	DATE	BY	REV.	DESCRIPTION
1	13E-10E1 & E2	D		FOSTER AVENUE PUMP STATION CONTROL (PANEL WIRING SCHEMATIC)
2	13E-24-E10	C		FOSTER AVENUE PUMP STATION SCADA SYSTEM UPGRADE - PL1
3	13E-24-E10A	C		FOSTER AVENUE PUMP STATION SCADA SYSTEM UPGRADE - PL1
4	MAR.30.00	BL	RET	RECORD DRAWING
5	SEP.12.04	N.L.	S.L.	AS BUILT
6	JUN.08.04	N.L.	S.L.	CONSTRUCTION REVISION
7	JUN.03.04	N.L.	S.L.	CONSTRUCTION REVISION
8	MAY.25.04	N.L.	S.L.	CONSTRUCTION REVISION
9	NOV.11/15	D.W.	VP	ISSUED FOR TENDER
10	NOV.24/04	D.W.	D.J.	ISSUED FOR REVIEW
11	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
12	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
13	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
14	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
15	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
16	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
17	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
18	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
19	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
20	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
21	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
22	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
23	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
24	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
25	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
26	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
27	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
28	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
29	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
30	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
31	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
32	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
33	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
34	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
35	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
36	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
37	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
38	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
39	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
40	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
41	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
42	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
43	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
44	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
45	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
46	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
47	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
48	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
49	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
50	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
51	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
52	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
53	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
54	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
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59	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
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67	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
68	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
69	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
70	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
71	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
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78	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
79	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
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83	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
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99	NOV.24/04	D.W.	J.B.M.	PRELIMINARY
100	NOV.24/04	D.W.	J.B.M.	PRELIMINARY

ASSOCIATED ENGINEERING **AE**

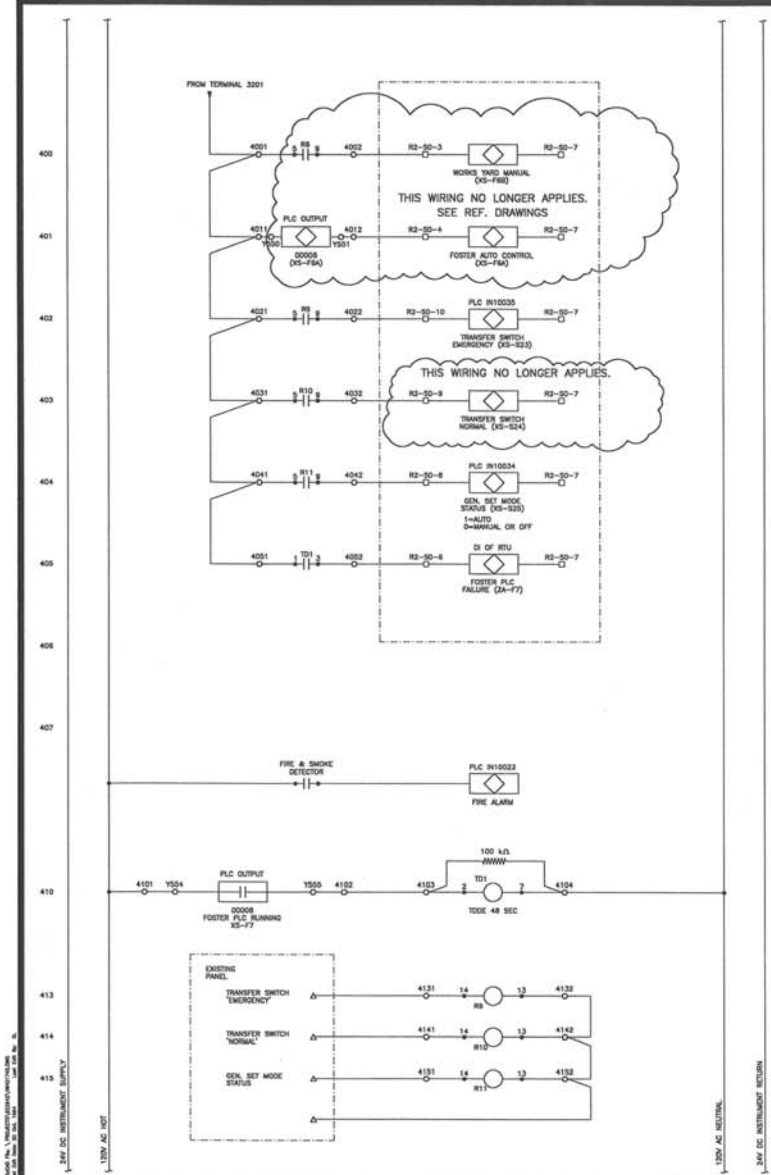
W1899-09PE

CITY OF COQUITLAM

ZONE 2 AND ZONE 3
WIRING SCHEMATIC

FOSTER AVENUE PUMP STATION
13 CABINET

DRAWING NUMBER	REV. NO.	SHEET
VW42-1-744	6	



REV.	CHG. NO.	REV.	TITLE
1	138-10E1 & E2	D	FOSTER AVENUE PUMP STATION CONTROL (PANEL WIRING SCHEMATIC)
2	138-34-E10	C	FOSTER AVENUE PUMP STATION SYSTEM UPGRADE-PH1 PLC I/O CONNECTIONS-DRAWING
3	138-34-E10A	C	FOSTER AVENUE PUMP STATION SYSTEM UPGRADE-PH1 PLC I/O CONNECTIONS

NO.	DATE	ENG.	BY	SUBJECT
1	APR.03.00	BU	RET	RECORD DRAWING
2	SEP.12.04	M.L.	S.L.	AS BUILT
3	JUN.03.04	M.L.	S.L.	CONSTRUCTION REVISION
4	JUN.03.04	M.L.	S.L.	CONSTRUCTION REVISION
5	MAY.25.04	M.L.	S.L.	CONSTRUCTION REVISION

PROJECT NO.	VW42 / 822942
SCALE	N/A
DRAWN	S.L.
DESIGNED	M.L.
CHECKED	
APPROVED	
DATE	MAY 1994

ASSOCIATED ENGINEERING **AE**

W1899-10PE

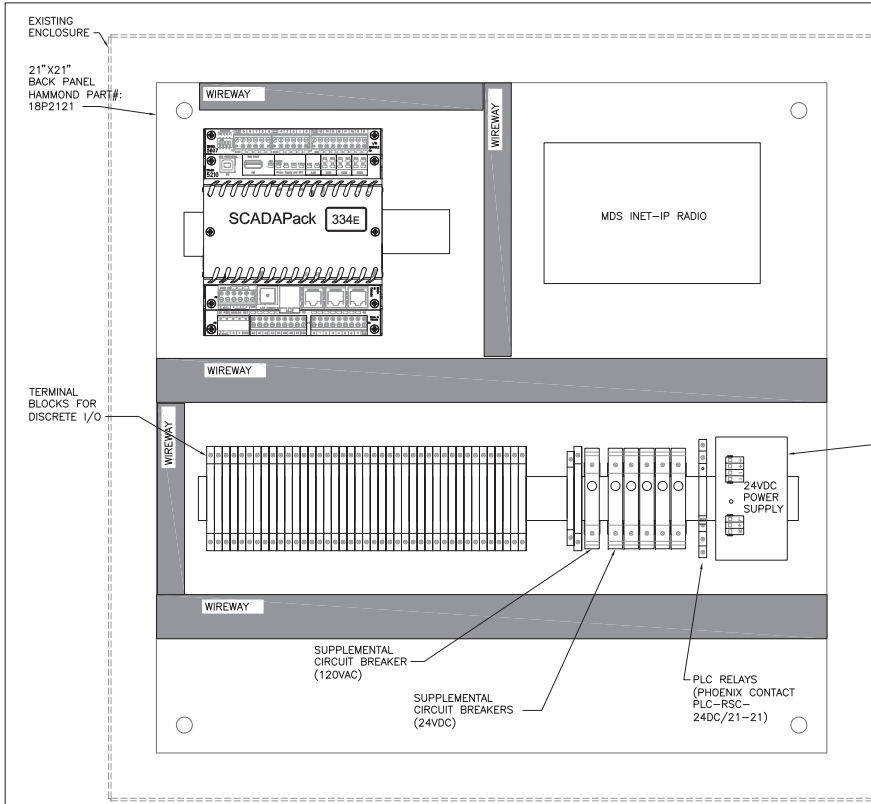
CITY OF COQUITLAM

ZONE 2 AND ZONE 3 WIRING SCHEMATIC

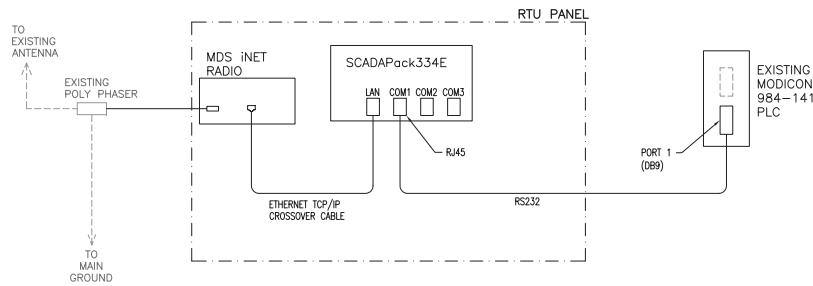
FOSTER AVENUE PUMP STATION 13 CABINET

DRAWING NUMBER	REV. NO.	SHEET
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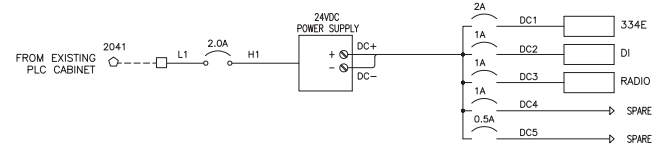
C10



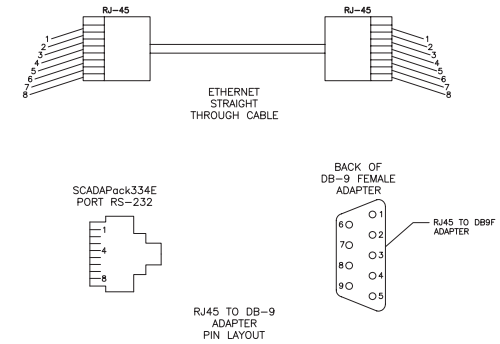
RTU PANEL LAYOUT
SCALE: 1:2



COMMUNICATION DIAGRAM



RTU CONTROL POWER WIRING DIAGRAM



PIN REQUIRED
FOR RS-232
PORT ON
SCADAPack334E

PIN REQUIRED
FOR DB-9 PORT
ON MODICON
984-141 PLC

PIN 5 (RX)
PIN 6 (TX)
PIN 4 (GND)

(TX) PIN 3
(RX) PIN 2
(GND) PIN 5

ADAPTER WIRING
SCHEMATIC

RS232 COMMUNICATION DIAGRAM
BETWEEN SCADAPack334E AND
MODICON 984-141 PLC

W3107-01PE

Dayton & Knight Ltd.
CONSULTING ENGINEERS
#210-888 HARBORSIDE DRIVE, NORTH VANCOUVER, B.C.
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BC Training
BC Employment
BC Recruitment
BC Retention
BC Succession
BC Leadership
BC Governance
BC Accountability
BC Transparency
BC Integrity
BC Honesty
BC Fairness
BC Justice
BC Equity
BC Inclusion
BC Diversity
BC Respect
BC Compassion
BC Empathy
BC Understanding
BC Tolerance
BC Patience
BC Kindness
BC Gentleness
BC Meekness
BC Mildness
BC Sweetness
BC Goodness
BC Faithfulness
BC Reliability
BC Trustworthiness
BC Dependability
BC Availability
BC Accessibility
BC Convenience
BC Efficiency
BC Effectiveness
BC Productivity
BC Performance
BC Quality
BC Excellence
BC Innovation
BC Creativity
BC Imagination
BC Vision
BC Inspiration
BC Motivation
BC Passion
BC Dedication
BC Commitment
BC Responsibility
BC Accountability
BC Transparency
BC Integrity
BC Honesty
BC Fairness
BC Justice
BC Equity
BC Inclusion
BC Diversity
BC Respect
BC Compassion
BC Empathy
BC Understanding
BC Tolerance
BC Patience
BC Kindness
BC Gentleness
BC Meekness
BC Mildness
BC Sweetness
BC Goodness
BC Faithfulness
BC Reliability
BC Trustworthiness
BC Dependability
BC Availability
BC Accessibility
BC Convenience
BC Efficiency
BC Effectiveness
BC Productivity
BC Performance
BC Quality
BC Excellence

COQ. PROJECT No.
92754

CITY OF COQUITLAM

Operations

DESIGNED - BJ/MK

DRAWN - MK/DK

METRIC - Horiz NONE

SCALE - Vert. NONE

APPROVED - DR

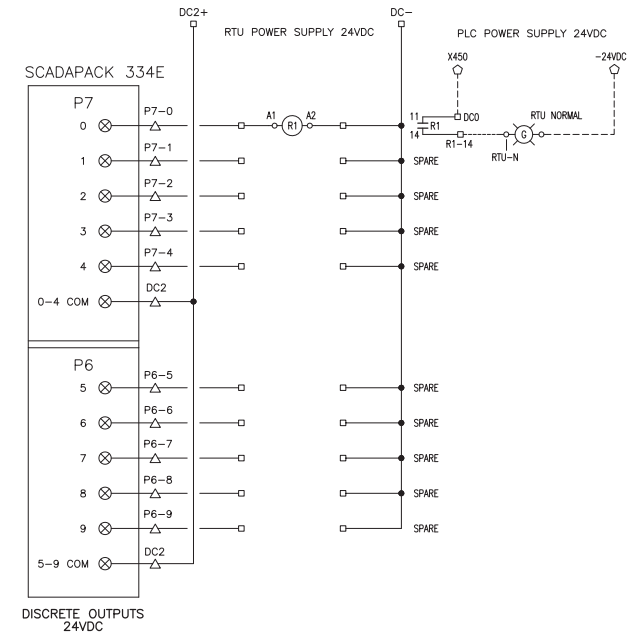
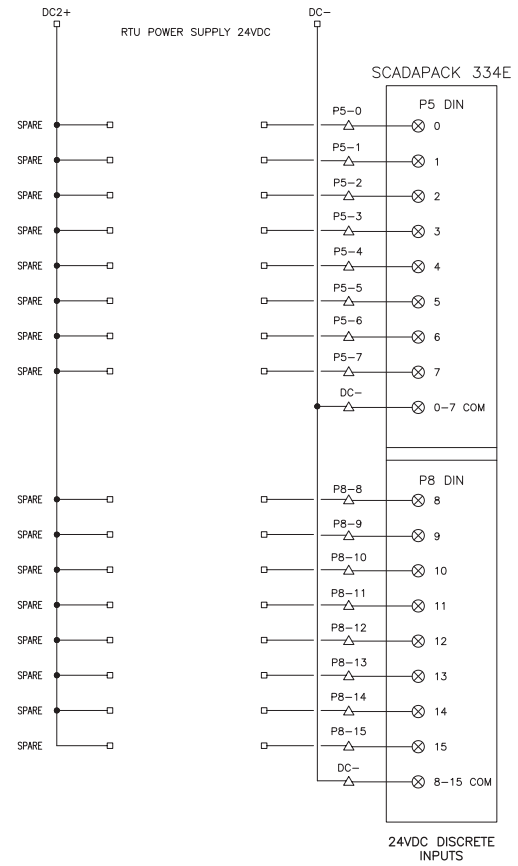
DATE - NOV 29/10

CITY OF COQUITLAM
FOSTER P.S.
RTU PANEL LAYOUT &
WIRING DIAGRAMS

FILE -
CONSULTANTS
DWG No- 138.94 E1
CITY
DWG No
SHEET 1 OF 2
PLOT DATE/TIME
Nov 30, 2010-9:08am

REV'D	DATE	BY	CHK'D	DESCRIPTION
4	NOV 29/10	DK	BJ	RECORD DRAWING
3	FEB 18/10	MK	BJ	100% SUBMISSION
2	FEB 17/10	MK	BJ	95% SUBMISSION FOR REVIEW
1	FEB 12/10	MK	BJ	90% SUBMISSION FOR REVIEW

Destroy All Prints Bearing Previous Rev. No.



IMPORTANT:
HYDRO, GAS AND TELEPHONE ARE NOT SHOWN ON THE CITY OF COQUITLAM AS-BUILT'S OR RECORD DRAWINGS. CONTACT BC HYDRO, TERAEN GAS AND TELUS FOR CURRENT AS-BUILT'S PERTAINING TO THESE UTILITIES.

NOTE:
LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED BY A PIPE LOCATOR AND MANUAL DIGGING. ALL OR ANY EXISTING STRUCTURES ARE NOT NECESSARILY SHOWN.

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W3107-02PE

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CITY OF COQUITLAM

COQ. PROJECT No.
92754

LEGEND				CITY OF COQUITLAM				Operations	
○	TERMINALS OUTSIDE RTU PANEL	— — —	N/O CONTACT	○(R)○	INDICATING LIGHT	OFF ON	2-POSITION SELECTOR SWITCH	DESIGNED — BJ/MK	FILE —
□	DIN RAIL MOUNTED TERMINALS FOR FIELD WIRING	— /— —	N/C CONTACT	○(X)○	RELAY COIL	OFF ON		DRAWN — MK/DK	CONSULTANTS DWG No. 138.94 E2
△	RTU TERMINALS	— — —	PUSH BUTTON	○(X)○	BUZZER	OFF ON		METRIC SCALE — Horiz NONE Vert. NONE	CITY DWG No.
—	WIRE INSIDE RTU PANEL	— — —	PRESSURE SWITCH (N/C)	○(X)○	CIRCUIT BREAKER	OFF ON		APPROVED — DR	SHEET 2 OF 2
---	WIRE OUTSIDE RTU PANEL	— — —	LIMIT SWITCH (N/O)	○(X)○				DATE — NOV 29/10	PLOT DATE/TIME: Nov 30, 2010-9:10am

FOSTER AVE RESERVOIR

THE DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

CONTRACT NO: 05 02 92/81

IMPORTANT:
HYDRO, GAS, TELEPHONE AND CABLE ARE NOT SHOWN ON THE CITY OF COQUITLAM AS-BUILT'S OR RECORD DRAWINGS. CONTACT BC HYDRO, FORTIS BC, TELUS AND SHAW FOR CURRENT AS-BUILT'S PERTAINING TO THESE UTILITIES.

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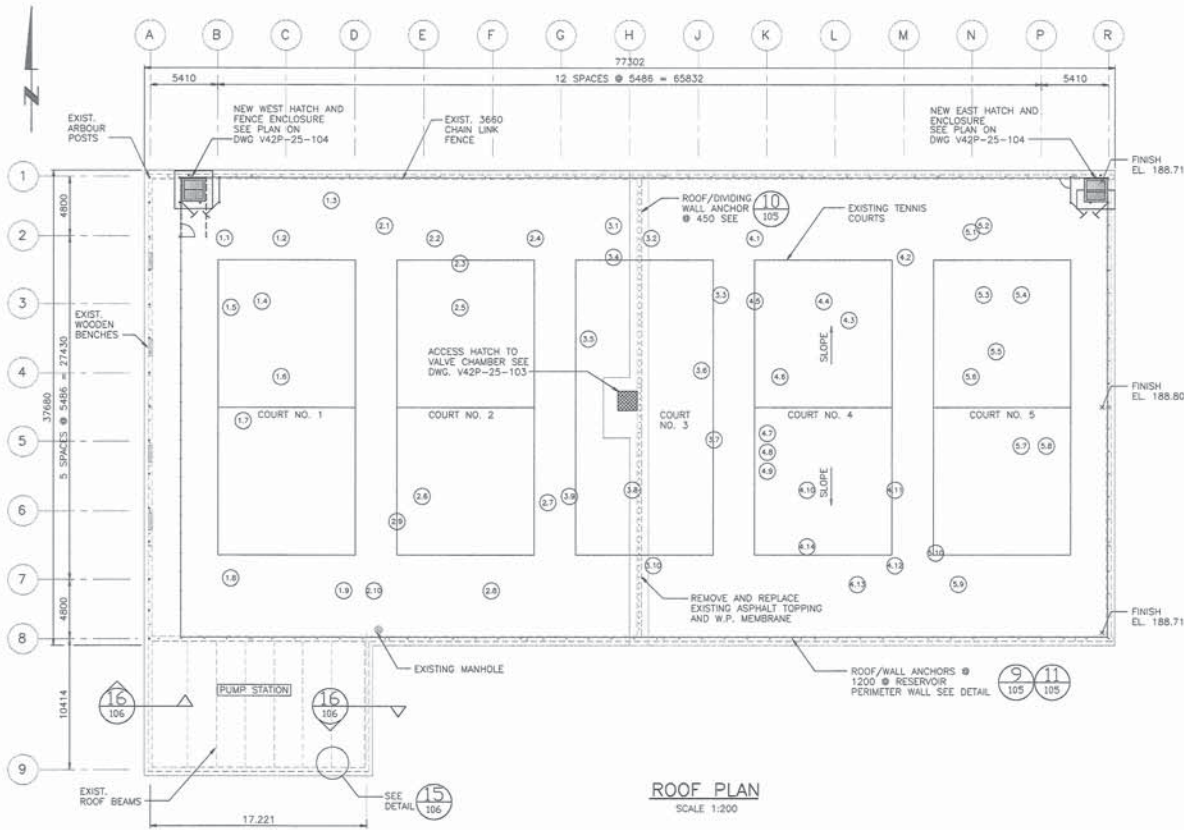
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Coquitlam
Record Drawing Number

W3255

**ASSOCIATED
ENGINEERING**





AREA NO.	PAVEMENT AREA m ²
1.1	0.8
1.2	4.5
1.3	0.3
1.4	0.3
1.5	1.6
1.6	0.6
1.7	1.2
1.8	0.6
1.9	1.2

AREA NO.	PAVEMENT AREA m ²
2.1	4.3
2.2	2.9
2.3	10.9
2.4	7.4
2.5	0.2
2.6	0.9
2.7	2.9
2.8	1.8
2.9	1.8
2.10	0.3

AREA NO.	PAVEMENT AREA m ²
3.1	0.8
3.2	0.6
3.3	0.2
3.4	0.7
3.5	0.2
3.6	4.3
3.7	1.0
3.8	0.4
3.9	0.5
3.10	0.6

AREA NO.	PAVEMENT AREA m ²
4.1	0.4
4.2	0.6
4.3	1.4
4.4	0.4
4.5	8.4
4.6	3.4
4.7	0.8
4.8	1.0
4.9	0.2
4.10	2.5
4.11	1.4
4.12	2.7
4.13	1.1
4.14	0.2

AREA NO.	PAVEMENT AREA m ²
5.1	7.8
5.2	1.2
5.3	11.2
5.4	12.0
5.5	1.0
5.6	4.6
5.7	0.6
5.8	2.9
5.9	6.7
5.10	0.6

GENERAL NOTES:

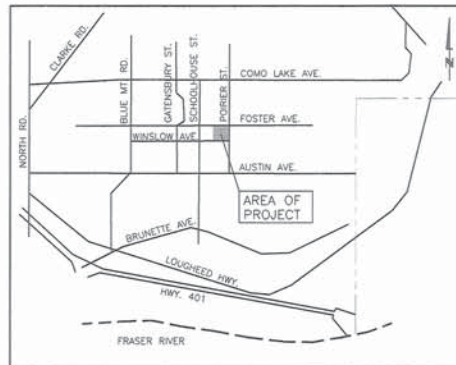
1. (13) = TYPICAL LOCATION OF PROPOSED PAVEMENT REPAIR
2. REMOVE AC PAVEMENT TO A DEPTH OF 25mm WITH RESPECT TO THE ADJACENT PAVEMENT IN AREAS DESIGNATED BY THE ENGINEER.
3. MAINTAIN THE INTEGRITY OF THE WATERPROOF MEMBRANE. ANY DAMAGE SHALL BE REPORTED TO THE ENGINEER FOR ASSESSMENT.

IMPORTANT:
HYDRO, GAS, TELEPHONE AND CABLE ARE NOT SHOWN ON THE CITY OF COQUITLAM AS-BUILTS OR RECORD DRAWINGS. CONTACT BC HYDRO, FORTIS BC, TELUS AND SHAW FOR CURRENT AS-BUILTS PERTAINING TO THESE UTILITIES.

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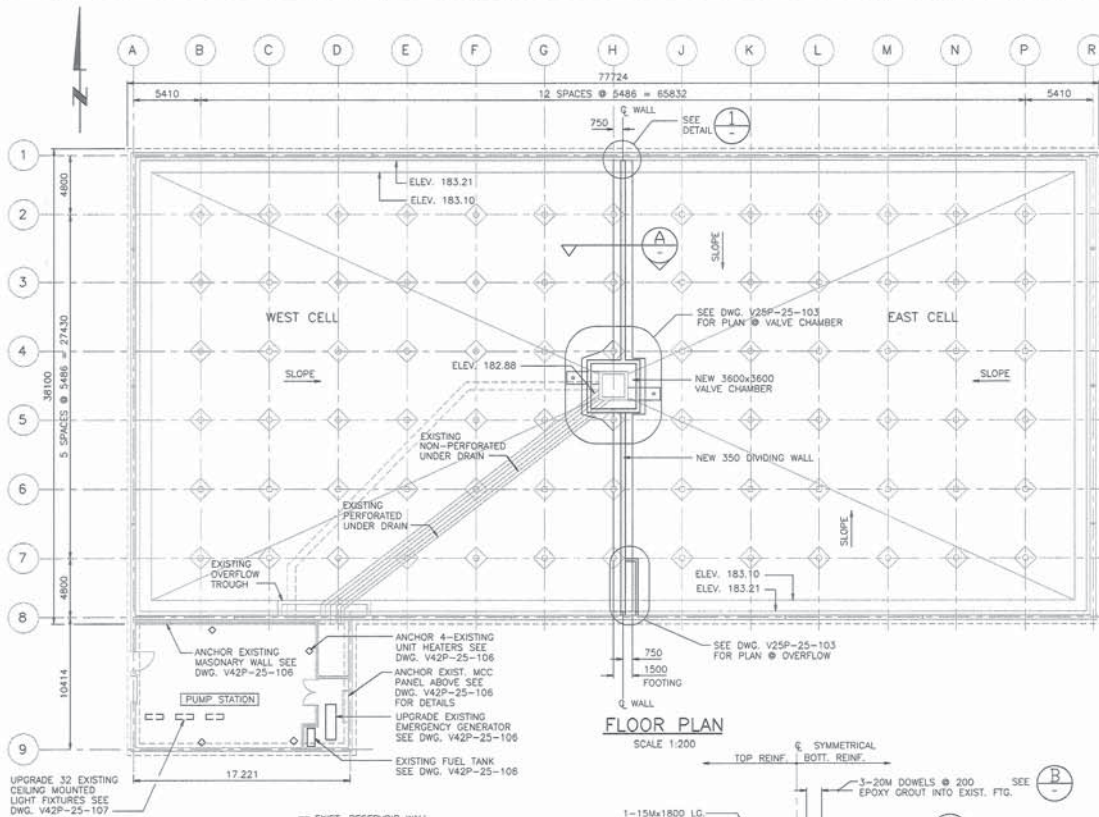
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FOSTER AVENUE RESERVOIR

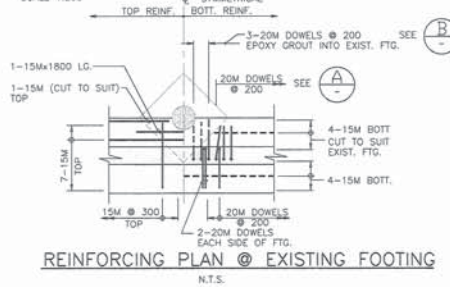
ROOF PLAN

DRAWING NUMBER	REV. NO.	SHEET
V42P-25-101		



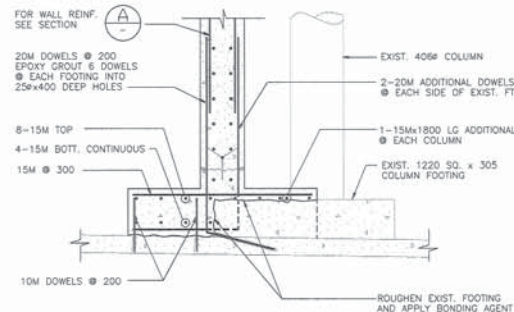
FLOOR PLAN

SCALE 1:200



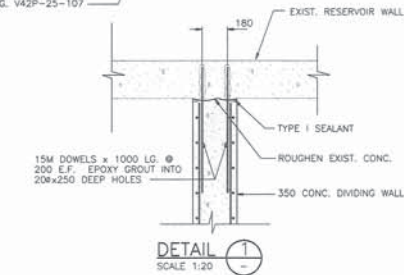
REINFORCING PLAN @ EXISTING FOOTING

N.T.S.



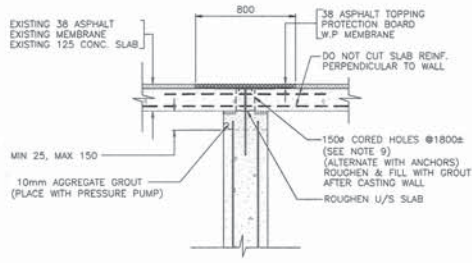
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SCALE 1:20



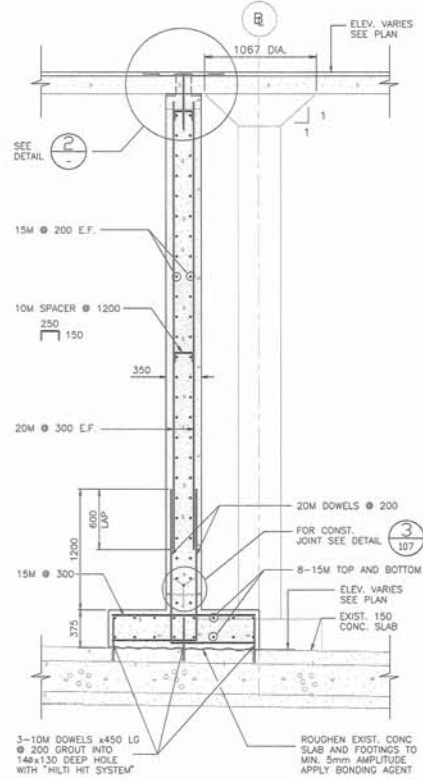
DETAIL 1

SCALE 1:20



DETAIL 2

SCALE 1:20



SECTION A

SCALE: 1=25

NOTES:

- MAXIMUM CONSTRUCTION LOAD ON ROOF
 - 1.9 kPa (40 PSF) OR
 - 1-2500 kg GVW VEHICLE
- CONCRETE TO CAN 3-A23.1 E.A.N., 25MPa @ 28 DAYS, SEE SPEC. FOR MIN. CEMENT.
- REINF. TO CSA G30.12-M, GRADE 400
 - MINIMUM CLEAR COVER = 50mm
 - REINF. LAPS=45 BAR DIAMETERS, EXCEPT AS NOTED.
- ROUGHEN EXISTING SLAB UNDER NEW FOOTING BY SHOT BLASTING.
- FLOOR DOWELS AND ANCHORS TO BE TESTED AS NOTED IN SPEC.
- PROVIDE FORMWORK WINDOWS AS REQUIRED FOR ACCESS TO VIBRATE CONCRETE.
- LOCATE CONTROL JOINTS IN DIVIDING WALL TO MATCH EXISTING ROOF JOINTS (MAXIMUM SPACING = 12000).
- ALL METAL FABRICATION HOT DIP GALVANIZED E.A.N.
- LOCATE TOP AND BOTTOM SLAB REINF. WITH PACHOMETER PRIOR TO CORING HOLES IN ROOF.
- FOR APPROX. LOCATION OF EXIST. ELEC. CONDUIT SEE DWG. 4009-30-W-504. CONTRACTOR TO CONFIRM LOCATION PRIOR TO CORING OR CUTTING CONCRETE.
- SEE MECH. DWG FOR NEW PIPING IN RESERVOIR AND PUMP STATION.
- SEE ELEC. DWG. FOR NEW CONDUIT IN RESERVOIR AND PUMP STATION.
- METAL FABRICATIONS IN PUMP STATION TO BE PAINTED.

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DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

FLOOR PLAN AND DETAILS

DRAWING NUMBER	REV NO.	SHEET
V42P-25-102		



1. SEE MECH. DWG. FOR PIPING

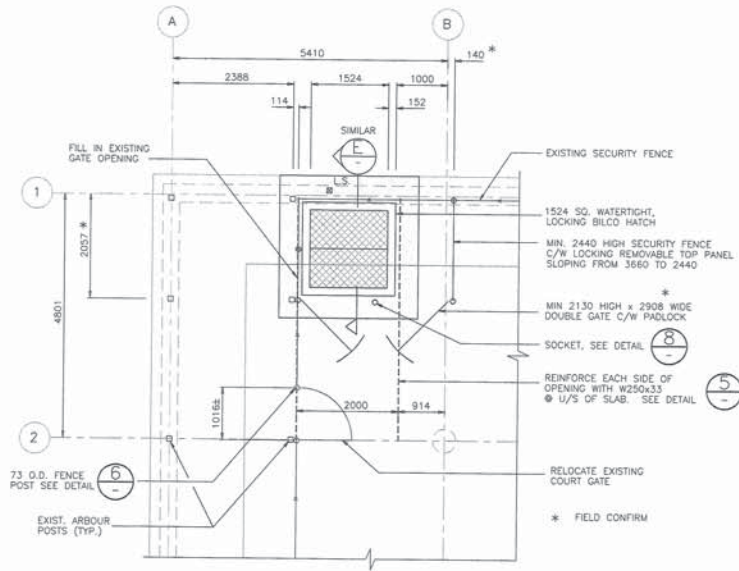
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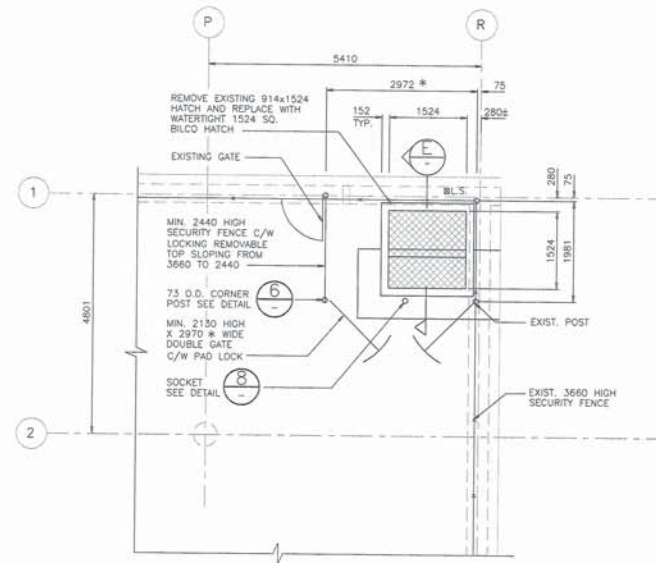
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ENGINEERING 

VALVE CHAMBER DETAILS

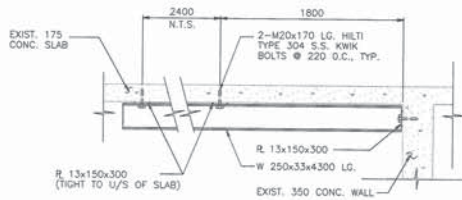
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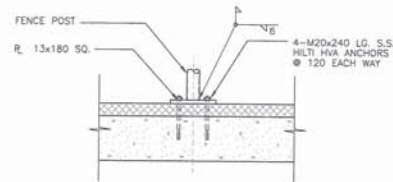
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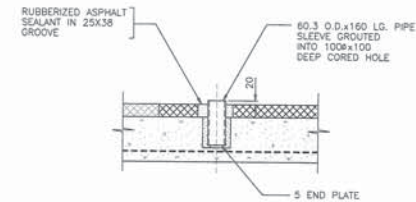
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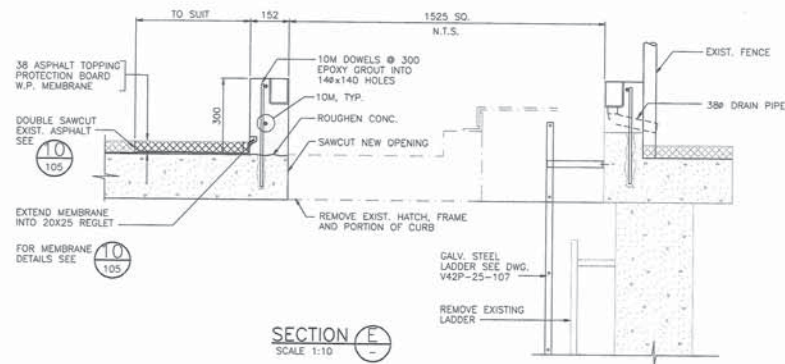
HATCH OPENING REINFORCING BEAM DETAIL (5)
N.T.S.



FENCE POST ANCHOR PLATE DETAIL (6)
N.T.S.



GATE SOCKET DETAIL (8)
N.T.S.



SECTION E
SCALE 1:10

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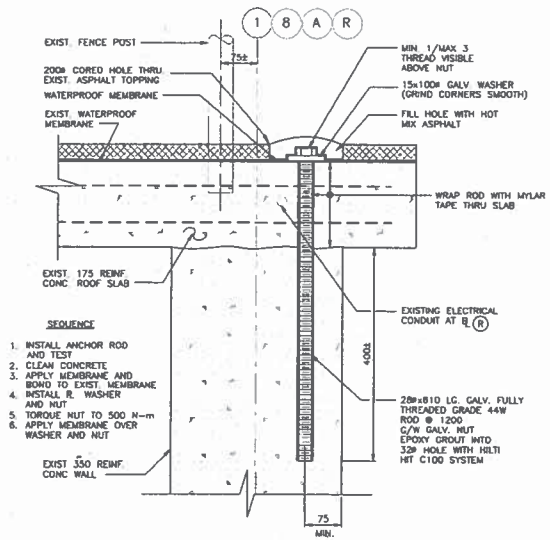
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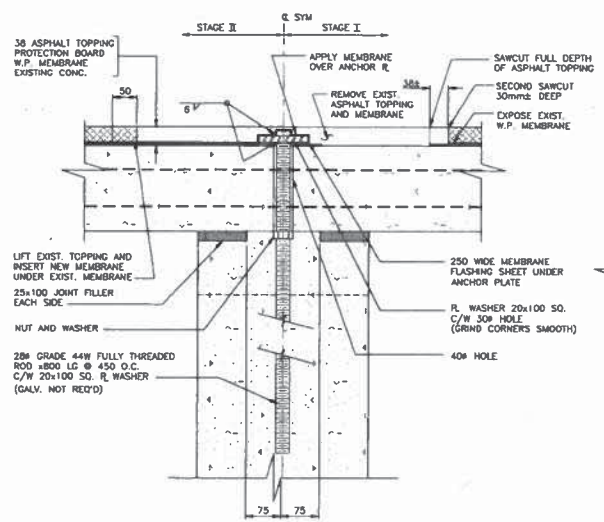
FOSTER AVENUE RESERVOIR

ROOF HATCH DETAILS

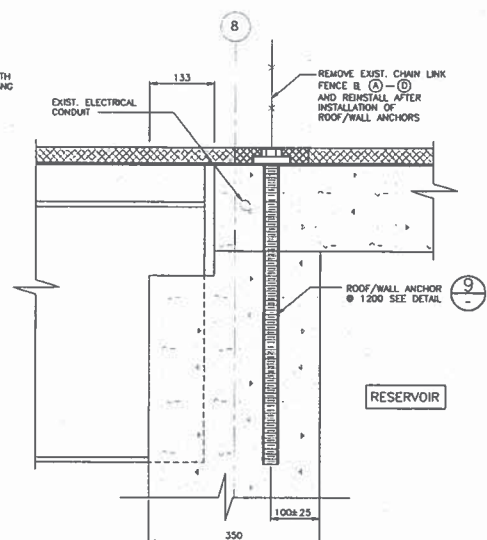
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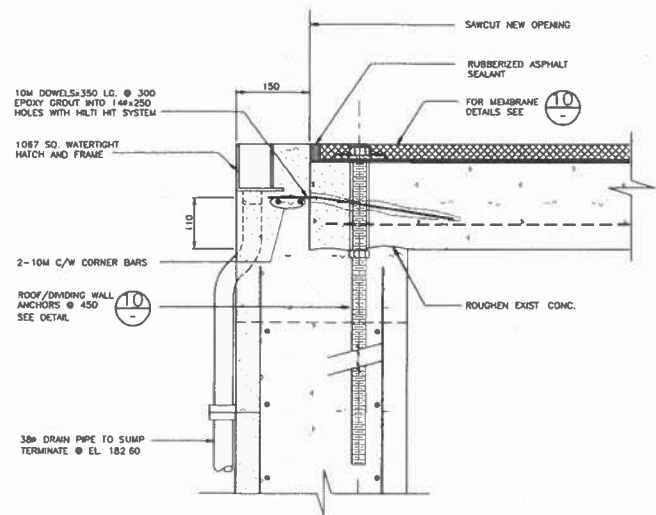
ROOF/WALL ANCHOR DETAIL (9)
SCALE 1:5



ROOF/DIVIDING WALL ANCHOR DETAIL (10)
SCALE 1:5



ROOF/WALL ANCHOR @ PUMP STATION (11)
SCALE 1:5



DETAIL (12)
SCALE 1:5

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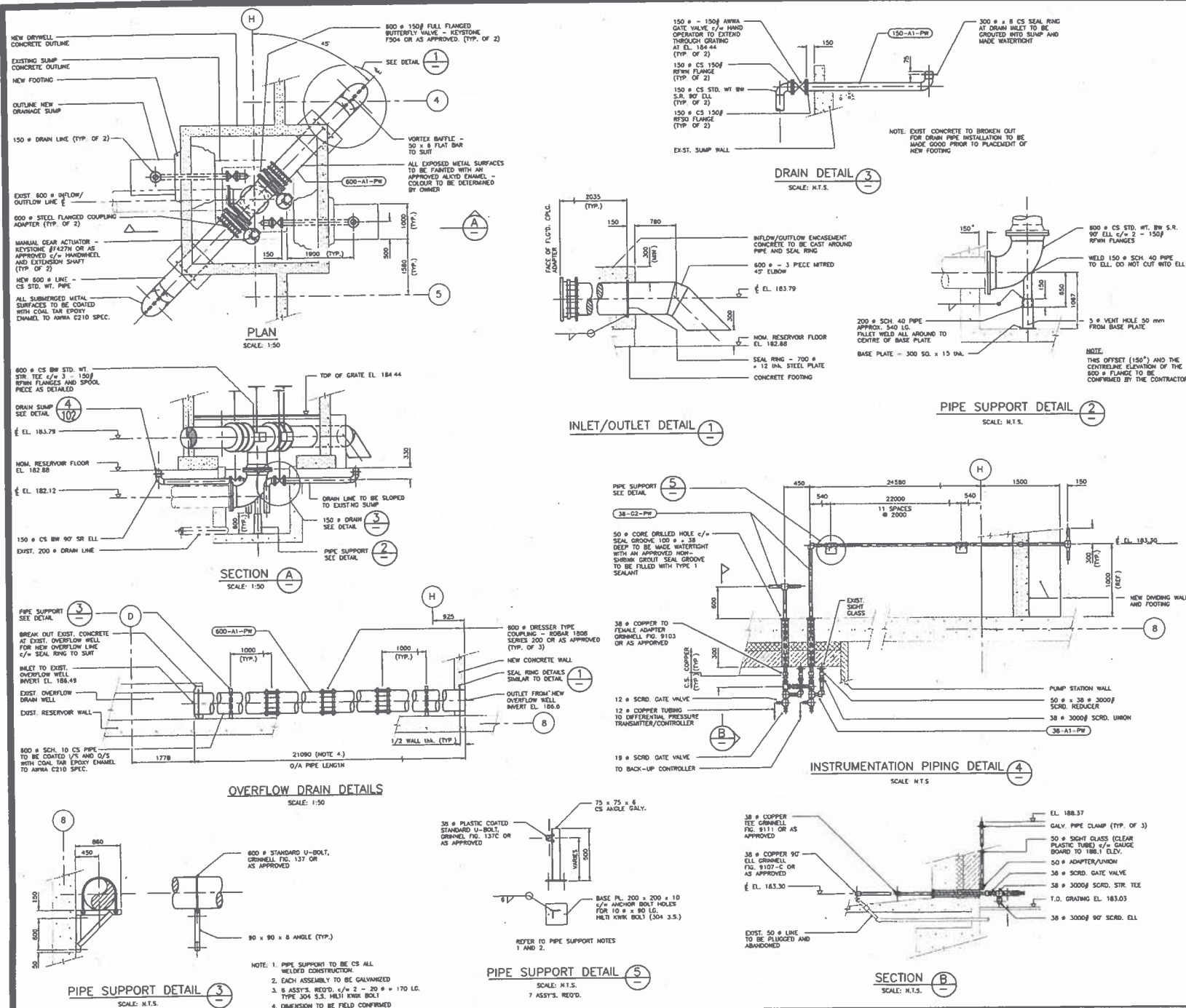
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FOSTER AVENUE RESERVOIR

DETAILS

DRAWING NUMBER	REV NO.	SHEET
V42P-25-105		



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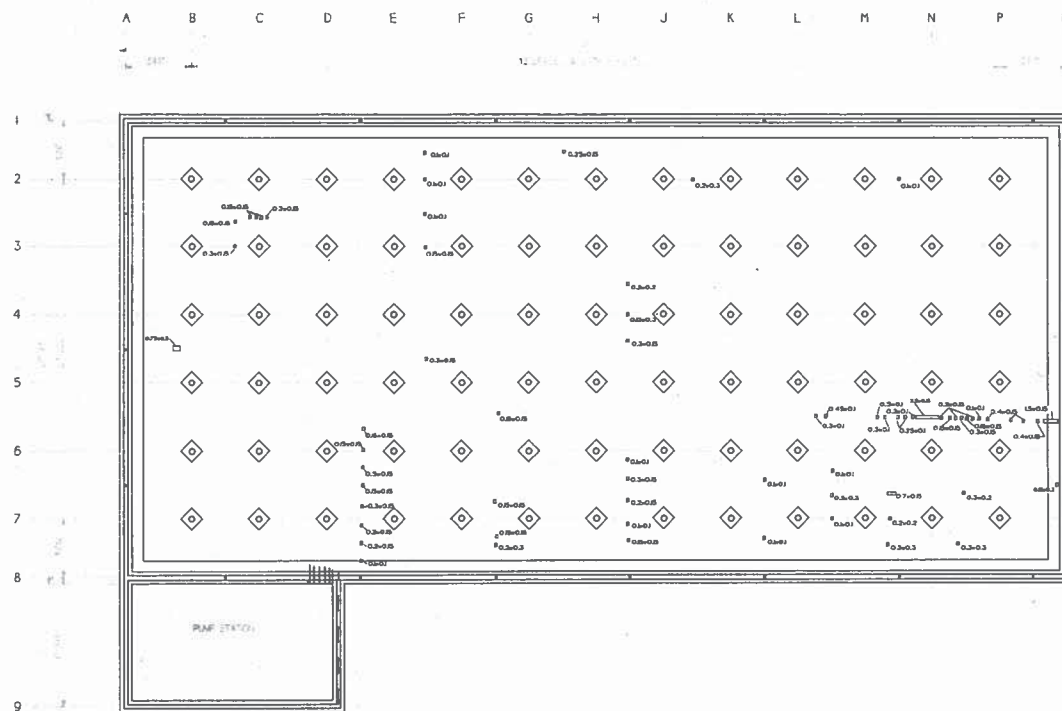
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FOSTER AVENUE RESERVOIR

PIPING PLAN AND DETAILS

DRAWING NUMBER	REV NO.	SH
V42P-30-108		



EXISTING ROOF REPAIRS

LEGEND

□ APPROXIMATE SPALL AREA, IN METRES.

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REVIEWS

11 200

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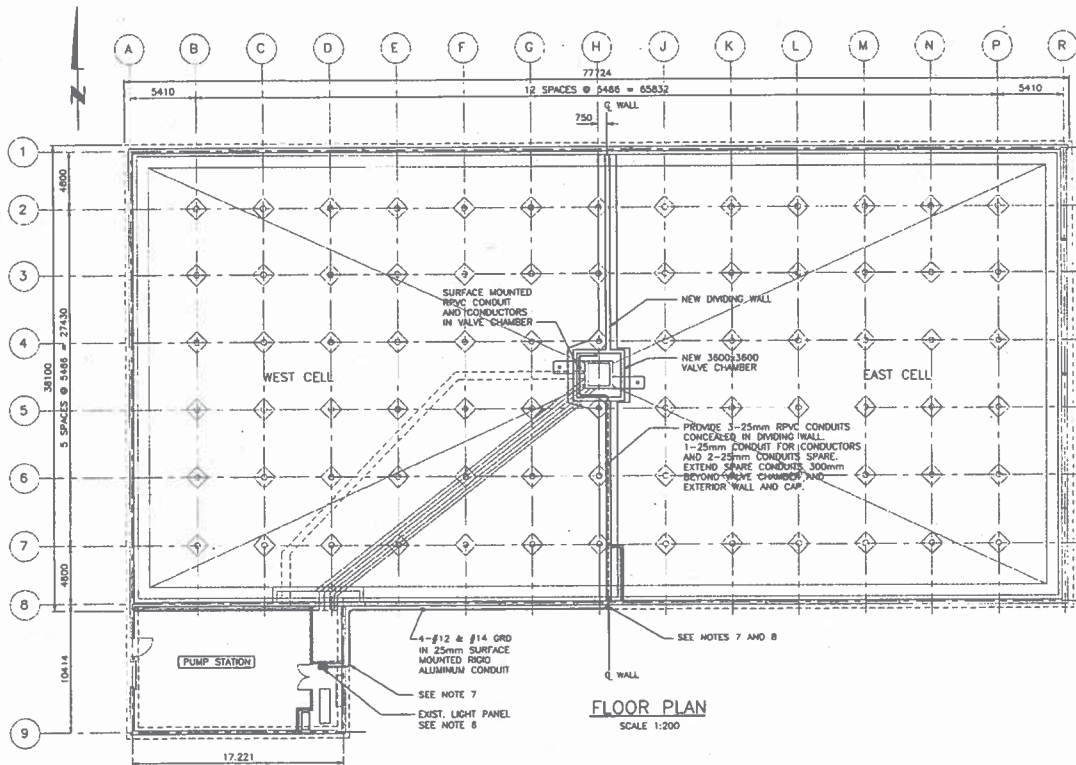
HBT AGRA Limited
ENGINEERING AND ENVIRONMENTAL SERVICES

DISTRICT OF COQUITLAM

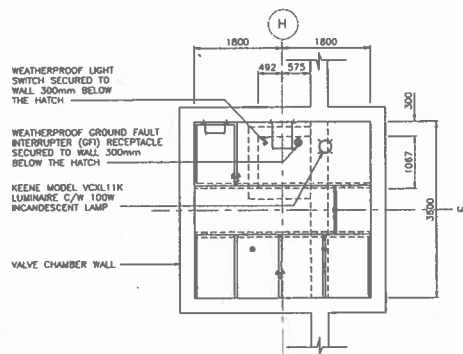
FOSTER AVENUE RESERVOIR

EXISTING ROOF REPAIRS

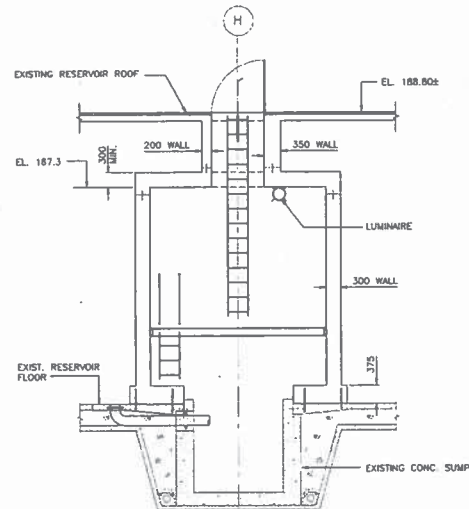
V42P-25-109



FLOOR PLAN
SCALE 1:200



VALVE CHAMBER PLAN
SCALE 1:50



VALVE CHAMBER-SECTION
SCALE 1:50

ELECTRICAL NOTES:

1. COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE WITH CSA C22.1 AND AS AMENDED FOR USE IN THE PROVINCE OF BRITISH COLUMBIA.
2. AFTER COMPLETION OF WORK, FURNISH CERTIFICATES OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT TO THE OWNER. OWNER WILL PROVIDE DRAWINGS REQUIRED BY ELECTRICAL INSPECTION DEPARTMENT.
3. IDENTIFY WIRING WITH TAB SHAW-CODE MARKERS WITH IDENTIFICATION ON BOTH ENDS OF CONDUCTORS.
4. CONDUITS SHALL BE RIGID PVC TO CSA C22.2 NO. 211.2 OR RIGID ALUMINUM AS SPECIFIED. CONCEAL CONDUITS UNLESS OTHERWISE SPECIFIED. PROVIDE NYLON PULL STRING IN ALL SPARE CONDUITS.
5. CONDUCTORS SHALL BE 1000V STRANDED COPPER XLPE RW90. MINIMUM SIZE SHALL BE 12 AWG. FOR POWER AND 14 AWG FOR CONTROL.
6. PROVIDE 1-15A BREAKER FOR VALVE CHAMBER LIGHT AND 1-15A BREAKER FOR GFI RECEPTACLE IN VALVE CHAMBER. TERMINATE CONDUIT TO EXISTING LIGHTING PANEL.
7. CORE HOLE TO PASS CONDUIT THROUGH AND MAKE GOOD ON COMPLETION WITH SIMILAR FINISH TO EXISTING SURFACE. CHECK EXISTING DRAWINGS BEFORE CUTTING OR CORING CONCRETE.
8. INSTALL ALUMINUM-RPVC CONDUIT TRANSITION COUPLING 350mm FROM EXTERIOR WALL FOR 3-25mm CONDUITS.

IMPORTANT:
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DISTRICT OF COQUITLAM

FOSTER AVENUE RESERVOIR

ELECTRICAL POWER LAYOUT

DRAWING NUMBER	REV NO	SHEET
V42P-25-110		

ASB 76

Appendix C -

Arborist Report

Arboricultural Inventory and Report

Site Location:

City of Coquitlam

Pump Station Upgrade

Foster PS at 1650 Foster Avenue

Coquitlam, BC



To be submitted with Tree Management Plan dated
March 2, 2023.

Submitted to:

Attn: Neal Whiteside

Water Street Engineering

#600 – 55 Water Street

Vancouver, BC V6B 1A1

Email: nwhiteside@waterstreeteng.com

Phone: 604.999.6876

Date: 2023, March 2

Submitted by:



The following Diamond Head Consulting staff conducted the on-site tree inventory and prepared or reviewed the report.

All general and professional liability insurance and staff accreditations are provided below for reference.

Supervisor:

Max Rathburn | Principal | Arboriculture Manager | Senior Arborist
ISA Certified Arborist (PN-0599A)
ISA Tree Risk Assessment Qualified (TRAQ)
BC Parks Wildlife and Danger Tree Assessor

Project Staff:

Joey Banh | Arborist
ISA Certified Arborist (PN-9035A)
ISA Tree Risk Assessment Qualified (TRAQ)
BC Parks Wildlife and Danger Tree Assessor (P3051)

Please contact us if there are any questions or concerns about the contents of this report.

Contact Information:

Phone: 604-733-4886
Fax: 604-733-4879
Email: Max@diamondheadconsulting.com or Joey@diamondheadconsulting.com
Website: www.diamondheadconsulting.com

Insurance Information:

WCB: # 657906 AQ (003)
General Liability: Northbridge General Insurance Corporation - Policy #CBC1935506, \$10,000,000
Errors and Omissions: Lloyds Underwriters – Policy #1010615D, \$1,000,000

Scope of Assignment:

Diamond Head Consulting Ltd. (DHC) was retained to complete an arboricultural assessment to supplement the proposed development application for the Foster Pump Station at 1650 Foster Avenue in Coquitlam. This report has an inventory of trees and summarizes management recommendations with respect to future development plans and construction activities. The approximate location and general health of off-site trees are included, as a limited assessment, because there is a legal obligation to protect them. This report is produced with the following primary limitations, detailed limitations specified in Appendix 7:

- 1) Our investigation is based solely on visual inspection of the trees during our last site visit. This inspection is conducted from ground level. We do not conduct aerial inspections, soil tests or below grade root examinations to assess the condition of tree root systems unless specifically contracted to do so.
- 2) Unless otherwise said, tree risk assessments in this report are limited to trees with a *high* or *extreme* risk rating in their current condition, and in context of their surrounding land use at the time of assessment.
- 3) The scope of work is primarily decided by site boundaries. Only trees specified in the scope of work were inventoried.
- 4) Beyond six months or if there are significant changes to the site or to the trees, from the date of this report, the client must contact DHC to confirm its validity because site base plans and tree conditions may change beyond the original report's scope. Added site visits and report revisions may be needed after this point to ensure report accuracy for the municipality's development permit application process. Site visits and reporting needed after the first submission are not included within the original proposal fee and will be charged to the client at an additional cost.

The client is responsible for:

- Obtaining a tree removal permit from the relevant authority prior to any tree cutting.
- Reviewing this report to understand and implement all tree **risk**, removal and protection requirements related to the project.
- Understanding that we have shown trees along the outskirts of the property boundary but not shrubs or other material that could be impacted by your contractors working at your property. The trees we have located are approximate locations and a legal survey is required to determine proper ownership of a tree. It is your responsibility to ensure that all plant material that may have roots passing property lines are protected.
- Obtaining relevant permission from adjacent property owners before removing off-site trees and vegetation.
- Obtaining a timber mark if logs are being transported offsite.
- Ensuring the project is compliant with the tree permit conditions.
- Constructing and maintaining tree protection fencing.
- Ensuring an arborist is present onsite to supervise any works in or near tree protection zones.

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Table 1: A list of tree replacement requirements per City of Coquitlam standard. Please refer to the City's website for the most current requirements.5

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1.0 Introduction

1.1 Site Overview

The subject site and pump station is at the SW corner of the large white canopied structure, west of the Pourier Tennis Court. The topography is mainly flat and slopes up towards the white canopied structure. A few large sized conifers and small trees are found south and SE of the subject site. An asphalt access path is on the west side of the proposed work site, gated by a wire fence.

Please note this site was assessed with significant snow cover. Visibility of the ground and any surface roots were limited.

1.2 Proposed Land Use Changes

The proposed project consists of upgrades to the pump station which includes a diesel generator, a transformer, and a staircase to the pump station. In preparing this report, we reviewed the following information:

- Civil Site Plan provided by the client.

1.3 Report Objective

This report has been prepared to ensure the proposed development is compliant with the City of Coquitlam Tree Management Bylaw No. 4091, 2010. Refer to Bylaw 4091 for the complete definition of protected trees, summarized below as:

- Living, erect, woody plants with a diameter equal to or greater than 20 cm (measured 1.4 m from the base of the tree stem) for a single stem or multiple trunks measured together;
- Living, erect, woody plant on a steep slope (>36%) that measures 5 or more metres in height;
- Replacement trees (or a tree planted or retained with a previous development related permit).
- Trees within a SPEA or on steep slopes.

Bylaw 4068 requires that arborist reports for development assess the health of **existing trees and undergrowth** within a Watercourse Protection DPA. **Coquitlam's Arborist Report Guidelines for Development Applications request an inventory of on-site trees greater than 10 cm DBH and a count of any trees under that size.**

Trees on adjacent properties with a tree protection zone that extends into the subject site have also been captured in the arborist report.



Figure 1. Foster Pump Station at 1650 Foster Avenue in context of the surrounding landscape and infrastructure. Aerial image courtesy of Q the Map. Approximate work area highlighted in red.

2.0 Process and Methods

Joey Banh of Diamond Head Consulting (DHC) visited the site on March 1, 2023. The following methods and standards are used throughout this report.

2.1 Tree Inventory

Select trees on site and shared with adjacent properties were marked with a numbered tag and assessed for attributes including: species; height measured to the nearest meter; and, diameter at breast height (DBH) measured to the nearest centimeter at 1.4 m above grade. Off-site trees had a limited visual assessment and their locations have been noted, but not tagged. The general health and structural integrity of each tree was assessed visually and assigned to one of five categories: *excellent*; *good*; *moderate*; *poor*; or *dying/dead*. Descriptions of the health and structure rating criteria are given in Appendix 3.

Tree retention value, categorized as *high*, *medium*, *low*, or *nil*, was assigned to each tree or group of trees based on their health and structure rating, and potential longevity in a developed environment. Descriptions of the retention value ratings are given in Appendix 4. Recommendations for tree retention or removal were decided by taking into account a tree's retention value rating, its location in relation to proposed building envelopes and development infrastructure.

2.2 Tree Risk Assessment

Tree risk assessments were completed following methods of the ISA Tree Risk Assessment Manual¹. This methodology assigns risk based on the likelihood of failure, the likelihood of impact and the severity of consequence if a failure occurs. Only on-site trees that had *high* or *extreme* risk ratings in their current condition and in context of their surrounding land use were noted. . Appendix 5 gives the likelihood and risk rating matrices used to categorize tree risk. DHC recommends that on-site trees be re-assessed for risk after the site conditions change (e.g. after damaging weather events, site disturbance from construction, creation of new targets during construction or in the final developed landscape).

2.3 Tree Protection

Tree protection zones (TPZ) were calculated for each tree according to a minimum standard of 10 x DBH or dripline plus 1 m, whichever is larger, but may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions.

¹ Dunster, J.A., Smiley, E.T., Matheny, N. and Lilly, S. (2013). Tree Risk Assessment Manual. *International Society of Arboriculture*. Champaign, Illinois.

3.0 Findings: Tree Inventory and Risk Assessment

3.1 Tree Inventory

Table 1 summarizes the trees on site and Appendix 1 contains the complete tree inventory.

Twenty-seven (27) city trees are on the subject site.

Nineteen (19) city trees are proposed for removal to accommodate the proposed plan.

Eight (8) city trees are recommended for retention.

3.2 Tree Risk Assessment

No trees on this site pose a *high* or *extreme* risk to targets at the time of assessment.

4.0 Tree Replacement

The City of Coquitlam expects tree replacement based on lot size, the number of trees retained on the lot, and the class of replacement tree proposed. The project proponent and landscape architect may use the following table and the [City's list of suitable replacement trees](#) to plan tree replacements for each lot. Diamond Head Consulting has not prepared a replacement plan for this project but can upon request.

Table 1: A list of tree replacement requirements per City of Coquitlam standard. Please refer to the City's website for the most current requirements.

Lot Size (m ²)	Number of trees greater than 20cm stem diameter remaining on the lot after tree removal	Maximum number of required replacement trees
Less than 250 m ²	0	1 Class A or 1 Class B or 1 Class C
	1 or more	None
250m ² - 500 m ²	0	2 Class A or 3 Class B or 4 Class C
	1 or more	None
501m ² - 750 m ²	0	4 Class A or 6 Class B or 8 Class C
	1	2 Class A or 3 Class B or 4 Class C
	2 or more	None
751m ² - 1000 m ²	0	6 Class A or 9 Class B or 12 Class C
	1	4 Class A or 6 Class B or 8 Class C
	2	2 Class A or 3 Class B or 4 Class C
	3 or more	None
1001m ² - 1250 m ²	0	8 Class A or 12 Class B or 16 Class C
	1	6 Class A or 9 Class B or 12 Class C
	2	4 Class A or 6 Class B or 8 Class C
	3	2 Class A or 3 Class B or 4 Class C
	4 or more	None
Over 1250 m ²	1 tree every 250m ²	None
	Less than 1 tree every 250m ²	1 Class A every 125m ² or 1 Class B every 85m ² or 1 Class C every 65m ²

5.0 Discussion and Summary

5.1 City Trees

C01 – C20 are growing together on the SW corner of the proposed work area.

Retention feasibility:

- C22 is a declining large Western Redcedar and cannot be reasonably retained.
- C11 – C21 & C23 are either saplings or young trees. It may be possible to transplant these trees for reuse on-site. The cost of transplanting will be determined once a final location is selected. This work must be done by an experienced tree mover, under Arborist direction.

With the current plan:

- C05 – C09 are proposed for removal because they are in conflict with the proposed fencing.
- C10 – C17 are proposed for removal because they are in conflict with the proposed DBII conduit.
- C18 – C21 are proposed for removal because they are in conflict with construction access.
- C22 and C23 are proposed for removal to accommodate the proposed pump station upgrade design.
- C01 – C04 are proposed to be retained.
- In addition, these retained trees provide cover between the pump station and the lawn bowling club and community centre.
- Therefore, it is desirable to retain C01 – C04 as client had discussed on site.

C24 – C27 are located east of the proposed work site. C26 and C27 were inventoried at the request of the client.

- No machinery access within the TPZ of C24-C27.
- Limit construction access to the existing west access.

All retained trees are to be retained and protected as detailed on the Tree Management Plan.

Additional tree information can be found in Appendix 1

Please note, tree locations for unsurveyed trees are approximate. Tree retention and removals may change during on site works.

5.2 Moving Infrastructure

Moving the proposed transformer further north may help with reducing impacts on tree root zones.

Appendix 1 Complete Tree Inventory Table

The complete tree inventory below contains information on tree attributes and recommendations for removal or retention. Tree ownership in this inventory table is not definitive, its determination here is based on information available from the legal site survey, GPS locations, and field assessment during site visits. Tree Protection Zones are measured from the outer edge of a tree's stem. If using these measurements for mapping the tree protection zone, $\frac{1}{2}$ the tree's diameter must be added to the distance to accommodate a survey point at the tree's center. Where tree protection fencing is proposed to vary from the minimum municipal TPZ, comments will be included in the Retention/TPZ comments and shown on the Tree Retention and Removal Plan.

*TPZ is the tree protection zone size required by the relevant municipal bylaw or, if not defined, the project arborist.

Surveyed? Y/N	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Dripline Radius (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Y	C01	City	Bitter Cherry	<i>Prunus emarginata</i>	40	16	3	Moderate	Rowing in clump of trees and other vegetation. Asymmetrical crown suppressed by adjacent trees. Ivy taken over tree. Remove ivy if retaining.	-	Retain	Protect as required.	4
Y	C02	City	Rowan/Mountain-Ash	<i>Sorbus aucuparia</i>	9	4	2	Moderate	Rowing in clump of trees and other vegetation. Triple stem. Crown heavily suppressed.	-	Retain	Protect as required.	3
N	C03	City	Western Red Cedar	<i>Thuja plicata</i>	11	5	2	Poor	Rowing in clump of trees and other vegetation. Single stem. Top has wound likely from previous failure with new leaders poorly attached. Heavily suppressed by adjacent trees. Ivy and blackberry beginning to take over.	-	Retain	Protect as required.	3
Y	C04	City	Bitter Cherry	<i>Prunus emarginata</i>	140	21	5	Moderate	Rowing in clump of trees and other vegetation. Triple stem at base with bark inclusion. Asymmetrical crown suppressed by adjacent trees. Phototropically corrected. Ivy and blackberry taking over. Remove ivy and blackberry if retaining. DBH estimated due to blackberry. 50+50+40.	-	Retain	Protect as required. TPZ adjusted to x8 multiplier to reflect site conditions.	11.2

Surveyed? Y/N	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Dripline Radius (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
N	C05	City	Bitter Cherry	<i>Prunus emarginata</i>	25	16	3	Moderate	Rowing in clump of trees and other vegetation. Single stem. Codominant leaders at 8 m. Asymmetrical crown suppressed by adjacent trees. Ivy taking over. Remove ivy if retaining.	-	Remove	In conflict with proposed new fencing.	2
N	C06	City	Vine Maple	<i>Acer circinatum</i>	4	10	2.5	Moderate	Row of 4 young volunteer saplings. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed new fencing.	1
N	C07	City	Vine Maple	<i>Acer circinatum</i>	8	10	2.5	Moderate	Row of 4 young volunteer saplings. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed new fencing.	1
N	C08	City	Vine Maple	<i>Acer circinatum</i>	6	10	2	Moderate	Row of 4 young volunteer saplings. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed new fencing.	1
N	C09	City	Vine Maple	<i>Acer circinatum</i>	7	10	3	Moderate	Row of 4 young volunteer saplings. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed new fencing.	1
N	C10	City	Bitter Cherry	<i>Prunus emarginata</i>	3	10	2	Poor	Growing in clump of trees and vegetation. Kinks at various points of stem. Poor vigour.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C11	City	Vine Maple	<i>Acer circinatum</i>	9	8	2.5	Moderate	Group of young saplings. Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C12	City	Vine Maple	<i>Acer circinatum</i>	9	8	2.5	Moderate	Group of young saplings. Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1

Surveyed? Y/N	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Dripline Radius (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
N	C13	City	Vine Maple	<i>Acer circinatum</i>	9	8	2.5	Moderate	Group of young saplings. Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C14	City	Vine Maple	<i>Acer circinatum</i>	3	6	2	Moderate	Group of young saplings. Single stem. Likely volunteer. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C15	City	Vine Maple	<i>Acer circinatum</i>	12	8	2.5	Moderate	Group of young saplings. Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C16	City	Vine Maple	<i>Acer circinatum</i>	12	8	2.5	Moderate	Group of young saplings. Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C17	City	Vine Maple	<i>Acer circinatum</i>	4	10	2	Moderate	Single stem. Asymmetrical crown suppressed by adjacent trees.	-	Remove	In conflict with proposed DBII conduits HV service conductors.	1
N	C18	City	Western Red Cedar	<i>Thuja plicata</i>	14	14	2.5	Moderate	Single stem. Growing in clump with other trees and vegetation. Crown suppressed by adjacent trees and vegetation.	-	Remove	In conflict with construction access.	3.5
N	C19	City	Western Red Cedar	<i>Thuja plicata</i>	8	9	2.5	Moderate	Single stem. Growing in clump with other trees and vegetation. Crown suppressed by adjacent trees and vegetation.	-	Remove	In conflict with construction access.	3.5
N	C20	City	Vine Maple	<i>Acer circinatum</i>	15	10	3	Moderate	Multistem at base. Asymmetrical crown suppressed by adjacent trees. Blackberry beginning to take over.	-	Remove	In conflict with construction access.	4
Y	C21	City	Bird Cherry	<i>Prunus padus</i>	5	10	3	Moderate	Growing furthest from clump. Likely volunteer. Asymmetrical crown suppressed by adjacent trees.	-	Remove	In conflict with construction access.	4

Surveyed? Y/N	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Dripline Radius (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Y	C22	City	Western Red Cedar	<i>Thuja plicata</i>	70	26	4	Poor	Single stem. Codominant leaders at 18 m. Crown thinning. LCR at 70%. Vines and blackberry taking over stem.	-	Remove	In conflict with proposed pump upgrades and due to existing condition.	7
Y	C23	City	Rowan/Mountain-Ash	<i>Sorbus aucuparia</i>	12	8	2	Moderate	Codominant stem. Vines taking over. Some tops broken off and left with tears on stubs. Vines and blackberry taking over stem.	-	Remove	In conflict with proposed transformer.	3
Y	C24	City	Douglas-Fir	<i>Pseudotsuga menziesii</i>	120	34	5	Moderate	Dominant tree. Single stem. Conjoined with C25 with acute bark inclusion. Resinosis on NW side of stem. Roots growing below wooden retaining wall and lifting brick walking path.	-	Retain	Protect as required. TPZ adjusted to x8 multiplier to reflect site conditions.	9.6
N	C25	City	Western Red Cedar	<i>Thuja plicata</i>	70	26	4	Moderate	Single stem. Conjoined with C24 with acute bark inclusion. Roots growing below wooden retaining wall and lifting brick walking path and asphalt.	-	Retain	Protect as required.	7
N	C26	City	Douglas-Fir	<i>Pseudotsuga menziesii</i>	70	32	4	Moderate	Single stem. Asymmetrical crown suppressed by adjacent trees. Inventoried at the request of the client.	-	Retain	Protect as required.	7
N	C27	City	Western Red Cedar	<i>Thuja plicata</i>	89	24	4	Moderate	Growing on slope. Triple stem near base. Asymmetrical crown suppressed by adjacent trees. Included bark on branches and stem at 4 m. 50+21+18. Inventoried at the request of the client.	-	Retain	Protect as required.	8.9

Appendix 2 Site Photographs



Photo 1. Overview of subject site. Viewing west.



Photo 2. C24, C23, C22, and C01-C21 group. Trees listed from left to right in photo.



Photo 3. C01-C06 and C10 grouping.



Photo 4. C05-C21. Viewing north. C22 can be seen further back in photo.



Photo 5. C23 and C22. C04 can be seen behind C23 in photo.



Photo 6. C24 and C25 roots lifting asphalt and brick walkway.



Photo 7. C26 and C27. Other trees east of C26 and C27 can be seen in photo.

Appendix 3 Tree Health and Structure Rating Criteria

The tree health and structure ratings used by Diamond Head Consulting summarize each tree based on both positive and negative attributes using five stratified categories. These ratings indicate health and structural conditions that influence a tree's ability to withstand local site disturbance during the construction process (assuming appropriate tree protection) and benefit a future urban landscape.

Excellent: Tree of possible specimen quality, unique species or size with no discernible defects.

Good: Tree has no significant structural defects or health concerns, considering its growing environment and species.

Moderate: Tree has noted health and/or minor to moderate structural defects. This tree can be retained, but may need mitigation (e.g., pruning or bracing) and monitoring post-development. A moderate tree may be suitable for retention within a stand or group, but not suitable on its own.

Poor: Tree is in serious decline from previous growth habit or stature, has multiple defined health or structural weaknesses. It is unlikely to acclimate to future site use change. This tree is not suitable for retention within striking distance of most targets.

Dying/Dead: Tree is in severe decline, has severe defects or was found to be dead.

Appendix 4 Tree Retention Value Rating Criteria

The tree retention value ratings used by Diamond Head Consulting provide guidance for tree retention planning. Each tree in an inventory is assigned to one of four stratified categories that reflect its value as a future amenity and environmental asset in a developed landscape. Tree retention value ratings take into account the health and structure rating, species profile*, growing conditions and potential longevity assuming a tree's growing environment is not compromised from its current state.

High: Tree suitable for retention. Has a good or excellent health and structure rating. Tree is open grown, an anchor tree on the edge of a stand or dominant within a stand or group. Species of *Populus*, *Alnus* and *Betula* are excluded from this category.

Medium: Tree suitable for retention with some caveats or suitable within a group**. Tree has moderate health and structure rating, but is likely to require remedial work to mitigate minor health or structural defects. Includes trees that are recently exposed, but wind firm, and trees grown on sites with poor rooting environments that may be ameliorated.

Low: Tree has marginal suitability for retention. Health and structure rating is moderate or poor; remedial work is unlikely to be viable. Trees within striking distance of a future site developments should be removed.

Nil: Tree is unsuitable for retention. It has a dying/dead or poor health and structure rating. It is likely that the tree will not survive, or it poses an unacceptable hazard in the context of future site developments.

* The species profile is based upon mature age and height/spread of the species, adaptability to land use changes and tree species susceptibility to diseases, pathogen and insect infestation.

** Trees that are 'suitable as a group' have grown in groups or stands that have a single, closed canopy. They have not developed the necessary trunk taper, branch and root structure that would allow them to be retained individually. These trees should only be retained in groups.

Appendix 5 Risk Rating Matrices

Trees with a *probable* or *imminent* likelihood of failure, a *medium* or *high* likelihood of impacting a specified target, and a *significant* or *severe* consequence of failure have been assessed for risk and included in this report (Section 3.2). These two risk rating matrices showing the categories used to assign risk are taken without modification to their content from the International Society of Arboriculture Tree Risk Assessment Qualification Manual.

Matrix 1: Likelihood

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat Likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat Likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat Likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2: Risk Rating

Likelihood of Failure and Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very Likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat Likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Appendix 6 Construction Guidelines

Tree management recommendations in this report are made under the expectation that the following guidelines for risk mitigation and proper tree protection will be adhered to during construction.

Respecting these guidelines will prevent changes to the soil and rooting conditions, contamination due to spills and waste, or physical wounding of the trees. Any plans for construction work and activities that deviate from or contradict these guidelines should be discussed with the project arborist so that mitigation measures can be implemented.

Tree Protection Zones

A Tree protection zone (TPZ) is determined using either dripline or a DBH multiplier to define a radius measured in all directions from the outside of a tree's trunk. It is typically determined according to local municipal bylaw specifications and may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions. For retained trees, the TPZ and fencing indicated in this report are proposed as suitable in relation to the level of disturbance proposed on the site plan provided to the project arborist. Arborist consultation is required if any additional work beyond the scope of the plans provided is proposed near the tree. Work done in addition to the proposed impacts discussed in this report may cause the tree to decline and die.

Tree Protection Fencing: Tree protection zones (TPZs) will be protected by Tree Protection Fencing except where site features constrict roots (e.g., retaining walls or roads), where continual access is required (e.g., sidewalks), or when an acceptable encroachment into the TPZ is proposed, in which case the fencing will be modified. Tree Protection Fencing is shown on the Tree Protection Plan and, where it varies from the TPZ, the rationale is described in the inventory table in Section 3.1.

Within a TPZ, no construction activity, including materials storage, grading or landscaping, may occur without project arborist approval. Within the TPZ, the following are tree preservation guidelines based on industry standards for best practice and local municipal requirements:

- No soil disturbance or stripping.
- Maintain the natural grade.
- No storage, dumping of materials, parking, underground utilities or fires within TPZs or tree driplines.
- Any planned construction and landscaping activities affecting trees should be reviewed and approved by a consulting arborist.
- Install specially designed foundations and paving when these structures are required within TPZs.
- Route utilities around TPZs.
- Excavation within the TPZs should be supervised by a consultant arborist.
- Surface drainage should not be altered in such a way that water is directed in or out of the TPZ.

- Site drainage improvements should be designed to maintain the natural water table levels within the TPZ.

Prior to any construction activity, Tree Protection Fencing must be constructed as shown on the Tree Protection Plan. The protection barrier or temporary fencing must be at least 1.2 m in height and constructed of 2" by 4" lumber with orange plastic mesh screening. Tree Protection Fencing must be constructed prior to tree removal, excavation or construction and remain intact for the entire duration of construction.

Unsurveyed Trees

Unsurveyed trees identified by DHC in the Tree Retention Plan have been hand plotted for approximate location only using GPS coordinates and field observations. The location and ownership of unsurveyed trees cannot be confirmed without a legal surveyed. The property owner or project developer must ensure that all relevant on- and off-site trees are surveyed by a legally registered surveyor, whether they are identified by DHC or not.

Removal of logs from sites

Private timber marks are required to transport logs from privately-owned land in BC. It is property owner's responsibility to apply for a timber mark prior to removing any merchantable timber from the site. Additional information can be found at: <http://www.for.gov.bc.ca/hth/private-timber-marks.htm>

Regulation of Soil Moisture and Drainage

Excavation and construction activities adjacent to TPZs can influence the availability of moisture to protected trees. This is due to a reduction in the total root mass, changes in local drainage conditions, and changes in exposure including reflected heat from adjacent hard surfaces. To mitigate these concerns the following guidelines should be followed:

- Soil moisture conditions within the tree tree protection zones should be monitored during hot and dry weather. When soil moisture is inadequate, supplemental irrigation should be provided that penetrates soil to the depth of the root system or a minimum of 30 cm.
- Any planned changes to surface grades within the TPZs, including the placement of mulch, should be designed so that any water will flow away from tree trunks.
- Excavations adjacent to trees can alter local soil hydrology by draining water more rapidly from TPZs more rapidly than it would prior to site changes. It is recommended that when excavating within 6 m of any tree, the site be irrigated more frequently to account for this.

Root Zone Enhancements and Fertilization

Root zone enhancements such as mulch, and fertilizer treatments may be recommended by the project arborist during any phase of the project if they deem it necessary to maintain tree health and future survival.

Paving Within and Adjacent to TPZs

If development plans propose the construction of paved areas and/or retaining walls close to TPZs, measures should be taken to minimize impacts. Construction of these features would raise concerns for proper soil aeration, drainage, irrigation and the available soil volume for adequate root growth. The following design and construction guidelines for paving and retaining walls are recommended to minimize the long-term impacts of construction on protected trees:

- Any excavation activities near or within the TPZ should be monitored by a certified arborist. Structures should be designed, and excavation activities undertaken to remove and disturb as little of the rooting zone as possible. All roots greater than 2 cm in diameter should be hand pruned by a Certified Arborist.
- The natural grade of a TPZ should be maintained. Any retaining walls should be designed at heights that maintain the existing grade within 20 cm of its current level. If the grade is altered, it should be raised not reduced in height.
- Compaction of sub grade materials can cause trees to develop shallow rooting systems. This can contribute to long-term pavement damage as roots grow. Minimizing the compaction of subgrade materials by using structural soils or other engineered solutions and increasing the strength of the pavement reduces reliance on the sub-grade for strength.
- If it is not possible to minimize the compaction of sub-grade materials, subsurface barriers should be considered to help direct roots downward into the soil and prevent them from growing directly under the paved surfaces.

Plantings within TPZs

Any plans to landscape the ground within the TPZ should implement measures to minimize negative impacts on the above or below ground parts of a tree. Existing grass layer in TPZs should not be stripped because this will damage surface tree roots. Grass layer should be covered with mulch at the start of the project, which will gradually kill the grass while moderating soil moisture and temperatures. Topsoil should be mixed with the mulch prior to planting of shrubs, but new topsoil layer should not be greater than 20 cm deep on top of the original grade. Planting should take place within the newly placed topsoil mixture and should not disturb the original rooting zone of the trees. A two-meter radius around the base of each tree should be left unplanted and covered in mulch; a tree's root collar should remain free from any amendments that raise the surface grade.

Monitoring during construction

Ongoing monitoring by a consultant arborist should occur for the duration of a development project. Site visits should be more frequent during activities that are higher risk, including the first stages of construction when excavation occurs adjacent to the trees. Site visits will ensure contractors are respecting the recommended tree protection measures and will allow the arborist to identify any new concerns that may arise.

During each site visit the following measures will be assessed and reported on by a consulting arborist:

- Health and condition of protected trees, including damage to branches, trunks and roots that may have resulted from construction activities, as will the health of. Recommendations for remediation will follow.
- Integrity of the TPZ and fencing.
- Changes to TPZ conditions including overall maintenance, parking on roots, and storing or dumping of materials within TPZ. If failures to maintain and respect the TPZ are observed, suggestions will be made to ensure tree protection measures are remediated and upheld.
- Review and confirmation of recommended tree maintenance including root pruning, irrigation, mulching and branch pruning.
- Changes to soil moisture levels and drainage patterns; and
- Factors that may be detrimentally impact the trees.

DRAFT

Appendix 7 Report Assumptions and Limiting Conditions

- 1) Unless expressly set out in this report or these Assumptions and Limiting Conditions, Diamond Head Consulting Ltd. (“Diamond Head”) makes no guarantee, representation or warranty (express or implied) regarding this report, its findings, conclusions or recommendations contained herein, or the work referred to herein.
- 2) The work undertaken in connection with this report and preparation of this report have been conducted by Diamond Head for the “Client” as stated in the report above. It is intended for the sole and exclusive use by the Client for the purpose(s) set out in this report. Any use of, reliance on or decisions made based on this report by any person other than the Client, or by the Client for any purpose other than the purpose(s) set out in this report, is the sole responsibility of, and at the sole risk of, such other person or the Client, as the case may be. Diamond Head accepts no liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm (including without limitation financial or consequential effects on transactions or property values, and economic loss) that may be suffered or incurred by any person as a result of the use of or reliance on this report or the work referred to herein. The copying, distribution or publication of this report (except for the internal use of the Client) without the express written permission of Diamond Head (which consent may be withheld in Diamond Head’s sole discretion) is prohibited. Diamond Head retains ownership of this report and all documents related thereto both generally and as instruments of professional service.
- 3) The findings, conclusions and recommendations made in this report reflect Diamond Head’s best professional judgment given the information available at the time of preparation. This report has been prepared in a manner consistent with the level of care and skill normally exercised by arborists currently practicing under similar conditions in a similar geographic area and for specific application to the trees subject to this report on the date of this report. Except as expressly stated in this report, the findings, conclusions and recommendations it sets out are valid for the day on which the assessment leading to such findings, conclusions and recommendations was conducted. If generally accepted assessment techniques or prevailing professional standards and best practices change at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if generally accepted assessment techniques and prevailing professional standards and best practices change.
- 4) Conditions affecting the trees subject to this report (the “Conditions”, include without limitation, structural defects, scars, decay, fungal fruiting bodies, evidence of insect attack, discolored foliage, condition of root structures, the degree and direction of lean, the general condition of the tree(s) and the surrounding site, and the proximity of property and people) other than those expressly addressed in this report may exist. Unless otherwise stated information contained in this report covers only those Conditions and trees at the time of inspection. The inspection is limited to visual examination of such Conditions and trees without dissection, excavation, probing or coring. While

every effort has been made to ensure that any trees recommended for retention are both healthy and safe, no guarantees, representations or warranties are made (express or implied) that those trees will not be subject to structural failure or decline. The Client acknowledges that it is both professionally and practically impossible to predict with absolute certainty the behavior of any single tree, or groups of trees, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure and this risk can only be eliminated if the risk is removed. If Conditions change or if additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification of Conditions change or additional information becomes available.

- 5) Nothing in this report is intended to constitute or provide a legal opinion and Diamond Head expressly disclaims any responsibility for matters legal in nature (including, without limitation, matters relating to title and ownership of real or personal property and matters relating to cultural and heritage values). Diamond Head makes no guarantee, representation or warranty (express or implied) as to the requirements of or compliance with applicable laws, rules, regulations, or policies established by federal, provincial, local government or First Nations bodies (collectively, “Government Bodies”) or as to the availability of licenses, permits or authorizations of any Government Body. Revisions to any regulatory standards (including bylaws, policies, guidelines an any similar directions of a Government Bodies in effect from time to time) referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if any such regulatory standard is revised.
- 6) Diamond Head shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
- 7) In preparing this report, Diamond Head has relied in good faith on information provided by certain persons, Government Bodies, government registries and agents and representatives of each of the foregoing, and Diamond Head assumes that such information is true, correct and accurate in all material respects. Diamond Head accepts no responsibility for any deficiency, misinterpretations or fraudulent acts of or information provided by such persons, bodies, registries, agents and representatives.
- 8) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
- 9) Loss or alteration of any part of this report invalidates the entire report.

LEGEND

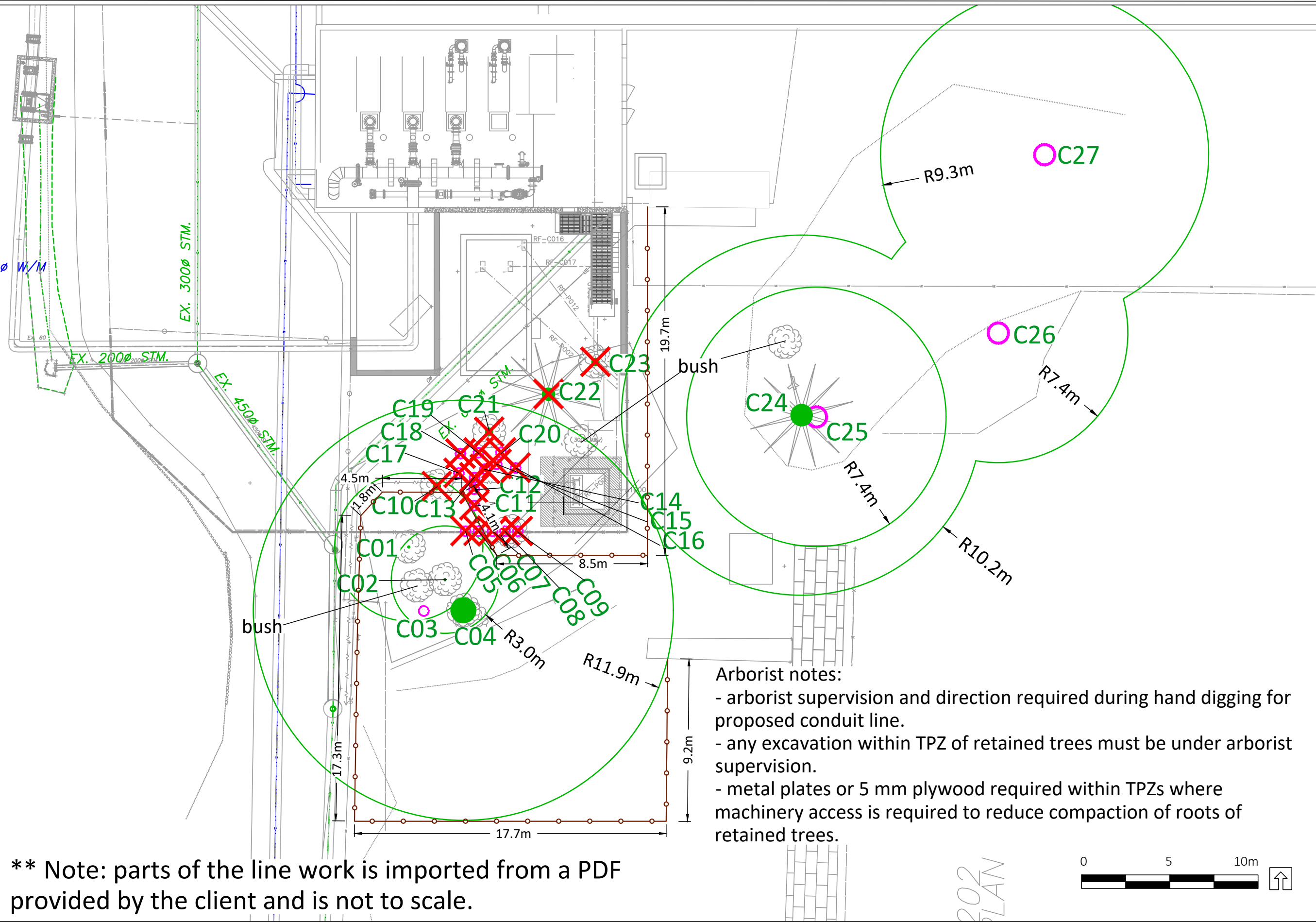
- CRITICAL ROOT ZONE
- NO-BUILD ZONE
- TREE PROTECTION ZONE AND FENCING
- SURVEYED TREE TO BE RETAINED
- UN-SURVEYED TREE TO BE RETAINED (MUST BE SURVEYED)
- SURVEYED TREE TO BE REMOVED
- UN-SURVEYED TREE TO BE REMOVED (MUST BE SURVEYED)

NOTES

- The location of un-surveyed trees on this plan is approximate. Their location and ownership cannot be confirmed without being surveyed by a Registered BC Land Surveyor.
- All tree protection fencing must be built to the relevant municipal bylaw specifications. The dimensions shown are from the outer edge of the stem of the tree.
- The tree protection zone shown is a graphical representation of the critical root zone, measured from the outer edge of the stem of the tree. $\frac{1}{2}$ the trees diameter was added to the graphical tree protection circles to accommodate the survey point being in the center of the tree)
- No work is permitted within the Tree Protection Zone with the exception of swales. Swale construction is only permitted under the direct supervision of an arborist.
- The 1.5m area No Build Zone does not allow for any building foundation wall encroachment. Excavation is permitted within this area under the direct supervision of an arborist.
- Drainage works such as lawn basins, associated piping or services are permitted within the No Build Zone under the direct supervision of an arborist.
- This plan is based on a topographic and tree location survey provided by the owners' Registered British Columbia Land Surveyor (BCLS) and layout drawings provide by the owners' Engineer (P Eng).
- This plan is provided for context only, and is not certified as to the accuracy of the location of features or dimensions that are shown on this plan. Please refer to the original survey plan and engineering plans.

REFERENCE DRAWINGS

- Base Survey by: provided by the client



Appendix D -

Geotechnical Report



March 1, 2023 (Version 1)
Project No.: K-221162-00

City of Coquitlam
c/o Water Street Engineering Ltd.
Unit 600 – 55 Water Street
Vancouver, B.C.
V6B 1A1

Attention: Neal Whiteside, MAsC, PEng, Principal, Senior Municipal Engineer
nwhiteside@waterstreeteng.com

RE: Geotechnical Assessment
Foster Pump Station Project – Proposed Generator Set
1650 Foster Street, Coquitlam, B.C.

Dear Mr. Whiteside,

1.0 INTRODUCTION

In accordance with your recent authorization, Kontur Geotechnical Consultants Inc. (Kontur) has completed this *Geotechnical Assessment* for the above-referenced project. The purposes of this study were to characterize the site from a geotechnical point-of-view and to provide comments and recommendations with respect to site development and foundation design.

This letter, which summarizes the findings of the *Geotechnical Assessment*, has been prepared in accordance with standard and widely accepted geotechnical engineering principles and practices for similar projects in this region. This letter does not address any environmental and archaeological issues or considerations related to the proposed project.

Review and use of this letter should be completed in accordance with the attached *Interpretation and Use of Study and Report* document. It is included as an integral part of this letter and should be read in conjunction with all parts of this letter.

2.0 UNDERSTANDING OF PROJECT

It is Kontur's understanding that the City of Coquitlam is planning to construct a new generator set (genset) at the existing Foster Pump Station located at 1650 Foster Street in Coquitlam, B.C. The proposed genset will be located south of the existing Foster Pump Station building and site development around the genset may include several retaining walls, a stairwell, fencing and gravel surfacing. The genset is proposed to be rectangular in shape and about 8.0m long by 4.0m wide and is assumed to be an above-ground structure.

Kontur prepared design drawings and specifications for the reinforced lock-block retaining wall located east of the proposed genset, which were issued under a separate cover. It is Kontur's understanding that the existing buried watermain pipe on the west side of the genset will be demolished, and the genset excavation will extend close to the existing concrete retaining wall at the west end of the site.

Construction of the proposed genset is tentatively scheduled for 2023 and as such, it is understood that the design team would like to design the proposed genset in accordance with the forthcoming updated



B.C. Building Code (BCBC), instead of the current 2018 B.C. Building Code. The incoming new B.C. Building Code is anticipated to be based on the current 2020 National Building Code of Canada.

3.0 METHODOLOGY AND FIELD WORK

3.1 Sources of Information

The following sources of information were reviewed as part of the desktop component of this study:

- Review of preliminary drawings provided by Water Street Engineering Ltd.;
- Foster Avenue Reservoir - Pump Station Piping Plan (District of Coquitlam As-Constructed Dwg. 4009-30-W-301, dated October 1973);
- Review of 90% structural design drawings provided by GEA Ltd.;
- Information obtained from Kontur's in-house geotechnical database of nearby projects;
- Kontur's nearby experience in the area;
- Published surficial geology maps of the area;
- Relevant information obtained from the City of Coquitlam's online web-mapping application; and,
- Geotechnical field explorations completed by Kontur on May 19, 2022.

3.2 Geotechnical Exploration

Kontur completed a geotechnical exploration on May 19, 2022. The geotechnical exploration was planned, coordinated, and supervised by Kontur field staff. Prior to advancing the testhole, a BC1Call was completed, and a subcontracted underground utility locate was completed *Quadra Utility Locating* of Port Coquitlam, B.C. Ground Penetrating Radar (GPR) and Electromagnetic (EM) scans were completed at each testhole location. The purpose of the scans was to assist with locating the testholes away from known and locatable existing buried services. The exploration program included completing one (1) hydro-vacuumed testhole south of the existing Foster Pump Station. Hydro-vacuum exploration was required due to the close proximity of buried utilities (watermain, storm sewer, and electrical conduit). The testhole was advanced to a depth of about 4m below existing ground surface. The testhole was completed using a hydro-vacuum truck owned and operated by *McCrae's Environmental* of Richmond, B.C.

Soil exposed during the hydro-vacuum excavation were visually logged, classified and sampled in the field by Kontur staff.

Representative soil samples were also obtained and taken back to Kontur's laboratory. Select tests were completed on representative samples, which included moisture contents. The locations of the completed testholes are shown on the attached *Figure 1* and *Figure 2*. Detailed soil logs are also attached to this letter.

4.0 SITE DESCRIPTION

4.1 General Conditions

The proposed genset will be located south of the existing Foster Pump Station, located at 1650 Foster Avenue in Coquitlam, B.C. The site will be bounded by the existing Foster Pump Station/Reservoir to the north, an existing concrete retaining wall to the west, and green space / sports field to the south and east.



Based on a review of the site plan drawing C102 provided by Water Street Engineering (dated May 2022) and supplemented with Kontur's *Site Reconnaissance*, the following site conditions were noted:

- The proposed genset enclosure will be located about 1.2m south of the existing Foster Pump Station and 1.2m east of the proposed retaining wall.
- The floor elevation within the existing pump station is El. 155.2m, Geodetic.
- The existing ground surface at the proposed genset location slopes up towards the north at an inclination of about 3.0(H):1(V) (Horizontal:Vertical). The existing ground elevation on the north side of the proposed genset is about El. 157.0m Geodetic, and about El. 154.8m Geodetic on the south side, where the ground surface flattens toward the south. The top of the slope abuts against the existing pump station's south-facing concrete wall, the existing substation, and extends beyond the pump station towards the east. This slope is inferred to be constructed of non-structural fill used to bury existing piping from the pumphouse (described in Section 4.2).
- There is a 1.3 to 3.7m high, north-south oriented existing concrete wall located approximately 6.1m from the west edge of the proposed genset that retains the fill from the adjacent asphalt road to the west. The road surface elevation at the base of the wall is about El. 155m, Geodetic.
- There is an existing buried 600mm diameter steel watermain located about 2.5m from the west edge of the proposed genset. Based on the utility location scans described above, it was inferred that the watermain is buried approximately 1.5m below the existing slope.
- Crossing roughly beneath the southeast quadrant of the proposed genset, there is an existing buried 600mm diameter storm sewer. Based on the provided 1972 Foster Pump Station as-constructed drawings and information provided by Water Street Engineering, the invert elevation of this pipe is understood to be about 5.4m below the existing ground surface (El. 151.6m, Geodetic).
- Crossing roughly beneath the southeast third of the proposed genset, there is an existing buried 100mm diameter electrical conduit. Based on the utility location scans described above, it was inferred that the electrical conduit is buried approximately 1.0m below the existing ground surface (El. 154m, Geodetic).

4.2 Surface Soil and Groundwater Conditions

According to surficial geology maps of the area, the site is underlain by the *Vashon Drift and Capilano Sediments* geological unit (Surficial Geology Map 1484A published by the Geological Survey of Canada). *Vashon Drift and Capilano Sediments* are described as lodgement till and minor flow till containing lenses and interbeds of glacio-lacustrine laminated stony silts, overlain by glaciomarine and marine deposits. The findings of the exploration program completed by Kontur as described in the following sections are considered to be generally consistent with the published surficial geology map.

Based on the findings of the testhole completed as part of the geotechnical exploration program, the following generalized subsurface soil and groundwater conditions are presented, with soil units in general order of increasing depths of occurrence:

- **Unit A – FILL.** The testhole encountered about 0.2m of topsoil underlain by about 1.3m of loose to compact silty sand fill. Concrete obstruction, about 0.2m thick was encountered at about 1.5m depth, underlain by another 1m of compact to dense silty sand fill.



- **Unit B – SILTY SAND (TILL-LIKE).** This unit was encountered beneath Unit A and extended down to the terminus of the testhole (i.e. about 4m depth). The soil unit encountered generally consisted of variable proportions of SILT and SAND with trace to some gravel/cobbles and trace clay, with occasional cobbles and/or boulders. Based on visual classification, this layer was noted to be dense to very dense with moisture contents ranging between about 3 to 8%.

Groundwater was not observed during excavation of the test hole (HV22-01) down to about 4m depth. However, groundwater levels are expected to vary (fluctuate) and are generally influenced by periods of prolonged or intense rainfall, rapid snowmelt and/or precipitation and/or nearby land usage. Perched or localized groundwater levels across the site should be anticipated to occur at the interface between granular materials, fine-grained materials, or topsoil layers.

It is important to note that the interpretation of the subsurface soil and groundwater conditions described above and encountered in the specific testholes are representative of the soil conditions in the immediate vicinity of each testhole. Extrapolation and interpretation of the soil profile and groundwater is formulated based on an assumed horizontal continuity of subsurface conditions across the site. Therefore, the soil units described above are generalized and based on the available testhole information only. Variation in the stratigraphic conditions should be expected as there is always an inherent level of uncertainty with respect to subsurface soil and groundwater conditions.

5.0 COMMENTS AND RECOMMENDATIONS

5.1 General

Based on the geotechnical exploration completed by Kontur, the information described above, and assuming the as-built details shown on the 90% design drawings (provided by Water Street Engineering) are representative of current conditions, the following comments and recommendations are made with respect to foundation design and site development. It is Kontur's opinion that the significant geotechnical considerations for this project are related to temporary excavation, bearing support of proposed foundations and their potential influence on nearby structures, and lateral earth pressures.

In general, the subgrade soils at the foundation elevation are expected to generally consist of the silty sand fill (Unit A) or dense to very dense Till-Like Soil (Unit B). Based on Kontur's review, Soil Unit B, or adequately compacted *Engineered Fill* placed thereon, are considered suitable to support the proposed structure on a rigid concrete slab-on-grade foundation system. The existing fills (unit A) are not considered suitable for ground support. Based on the existing elevations shown on the drawings provided by Water Street Engineering and the measurements made during the *Site Reconnaissance*, it is inferred that the elevation of the top of the concrete obstruction encountered in the testhole is at/near the elevation of the top of the floor slab of the pump station. The lateral extent of the concrete is currently not known and should be confirmed prior to site preparation. **Where existing concrete is present within the proposed footprint, provisions should be made to sawcut and remove the concrete in order to expose and remove and replace the underlying fill with *Engineered Fill*.**

In addition to the above, the proposed genset is located within proximity of existing nearby infrastructure and future new retaining walls. On this basis, depending on future development plans and finalized layout, the foundations for the proposed genset may adversely influence these nearby existing/future structures. In order to strategically locate the proposed genset and mitigate against potential unwanted



influences, as-built drawings of the various infrastructures/building (i.e. existing pump house, buried services, future walls, etc.) should be established in advance.

In all cases, the foundation for the proposed structure should be properly designed and constructed in accordance with the upcoming version of the BCBC and the minimum recommendations described in the following sections.

5.2 Seismic Considerations

It is anticipated that the upcoming version of the BCBC will reference the 2020 National Building Code of Canada (2020 NBCC). Therefore, the *Site Classification* for the proposed genset at the Foster Pump Station can be taken as *Site Class C – Very Dense Soil*. As interpolated from the 2020 NBCC Seismic Hazard Tool, per the requirements of the upcoming version of the BCBC, for firm ground at this site, for a 2% probability of exceedance of 50 years, the *Peak Ground Acceleration* at the site can be taken as 0.43. Spectral Acceleration values may be taken as noted in the attached 2020 National Building Code of Canada Seismic Hazard Tool output.

Based on the relative density of the soil strata encountered in the testhole, the site is not considered to be susceptible to liquefaction during a major seismic event.

5.3 Foundation Design and Post-Construction Settlement

A rigid concrete slab-on-grade or pad is considered suitable to provide support for the proposed genset from a geotechnical point-of-view. The concrete slab should be placed on a minimum of 300mm thick pad of adequately compacted *Engineered Fill* as approved by the Geotechnical Engineer.

Foundations should also be designed with the following parameters:

- For Serviceability Limit States Design, a Maximum Average Allowable Soil Bearing Pressure of 150kPa may be used for foundations placed on Soil Unit B or on adequately compacted *Engineered Fill* placed thereon. For Ultimate Limit States (ULS) design, a factored ultimate bearing resistance of 225kPa may be used for foundation design.
- Underside of proposed foundations should match that underside of the foundations for the existing Foster Pump Station.
- Depending on the finalized foundation elevation, unwanted lateral surcharge loads may be imposed on to near by structures/foundation walls. Foundations should be adequately setback from adjacent footings/structures with different elevations or other subgrade structures (i.e. sumps, utilities, etc.) as defined by a gradient line projected at 2H:1V (Horizontal: Vertical) slope from the underside of the lower footing or structure.
- *Engineered Fill* should extend at least 0.5m (or equal to the thickness of *Engineered Fill*, whichever is greater) beyond the edge of the foundation footprint.
- All foundations must be placed on a prepared surface as approved by the Geotechnical Engineer in accordance with the recommendations described below.
- Upon review and approval of the exposed subgrade by the Geotechnical Engineer, a blinding layer of lean mix concrete, approximately 50mm thick may be required depending on construction considerations.



- A Coefficient of Friction (Unfactored) 0.45 may be used between concrete and the prepared subgrade as discussed in this Geotechnical Letter.
- Site preparations have been completed as described in Section 5.7.2 and load bearing surfaces have been reviewed and approved by the Geotechnical Engineer.

Foundation settlement is expected to be primarily due to elastic compression of the in-situ undisturbed natural soil or compacted *Engineered Fill* placed under the proposed structure. For Serviceability Limit States design and the maximum recommended bearing resistances provided in the following sections, it is estimated that potential total post-construction settlements may be in the order of about 25mm, with a differential of about 12mm over a horizontal distance of about 8m.

5.4 Permanent Slopes

Permanent fill and/or cut slopes, if required, may be graded to no steeper than 2(H):1(V) and be properly protected against erosion (e.g. by establishing a thick cover of vegetation, durable rockfill, or other approved methods).

Appropriate drainage measures should be included for future retaining walls and may include, but not limited to use of free-draining material and installing foundation drains to prevent build-up of pore water pressures acting against buried walls.

5.5 Lateral Pressures and Retaining Walls

In general, retaining walls should be placed over subgrade with a minimum embedment as approved by the Geotechnical Engineer. A minimum 100mm thick bedding or leveling course of 19mm clear crush gravel should be placed over the approved subgrade and compacted prior to installing retaining walls.

Kontur has prepared design drawings and specifications for the proposed reinforced lock-block retaining wall located east of the proposed genset, which were issued under a separate cover.

It is understood that a reinforced concrete retaining wall is proposed west of the proposed genset. This wall should be designed to resist the lateral pressures acting upon it. The parameters shown in the attached *Figure 3 – Lateral Earth Pressure Diagram (Yielding Wall)* and *Figure 4 – Lateral Earth Pressure Diagram (At-Rest Condition)* may be used for the design of backfilled retaining walls assuming no build-up of hydrostatic pressure behind the wall (i.e. drained conditions). Any surcharges from adjacent building foundations and/or structures should be added to the recommended lateral earth pressures. Permanent foundation drainage measures should be implemented as discussed in Section 5.6, unless the wall is designed to withstand hydrostatic lateral earth pressures. A minimum 450mm wide zone of free-draining material should be placed against the retaining wall and hydraulically connected to the base of the foundation drain to prevent building up of pore water pressures against the wall.

5.6 Slab-on-Grade and Drainage Provision

For slab-on-grade construction, the slab-on-grade should be placed on a drainage layer consisting of at least 150mm thick of 19mm clear crushed gravel, placed on an approved surface as described above. The clear crushed gravel drainage layer should be thoroughly compacted to a dense state using suitable vibratory compaction equipment. The underside of the slab foundation should be provided with a 15-mil



polyethylene vapour barrier sheeting to reduce migration of moisture. The drainage layer should be hydraulically connected to the perimeter drainage system outlined below.

Foundation drains are recommended and should consist of a minimum 150mm diameter perforated drainpipe in a minimum 200mm thick surround of 19mm clear crushed gravel wrapped in geotextile. Water collected in the drainage system should be collected and discharged through separate systems to an appropriately located storm sewer, in accordance with local building bylaws. Stormwater runoff is not permitted to be discharged in an uncontrolled manner over the face of any slope, behind any retaining wall, or foundation.

The intent of the drainage provisions described above is to prevent a build-up of hydrostatic pressure beneath the foundation. All water- and/or damp- proofing aspects of the proposed genset are to be addressed by the Project Architect / Building Envelope Consultant.

5.7 Constructability Considerations

5.7.1 Temporary Excavation and Excavation Support

All Worksafe BC Regulations, Guidelines, and Best Practices, for safe and stable excavations should be implemented by the Contractor. An initial review by the Geotechnical Engineer should be completed for any excavations deeper than 1.2m below the surrounding ground surface. For planning purposes, unsupported temporary excavated slopes may be inclined to no steeper than about 1(H):1(V) (Horizontal:Vertical). Where seepage is encountered, unsupported excavation slopes should be inclined to no steeper than about 1.5(H):1(V). Flatter slopes may be necessary if loose/organic soils prone to caving/sloughing or where significant zones of groundwater seepage are encountered. Where these slopes cannot be achieved, temporary shoring support may be required. Temporary shoring may be in the form of conventional trench boxes, shoring cages, and/or sliding-rail systems. Any existing buried services within the proposed excavation should be identified in advance of site preparation, and temporarily/permanently re-routed beyond the excavation and/or adequately supported. Stockpiled soil material may not be permitted to be placed closer than 3m from the crest of the excavation.

During construction, temporary excavation, underpinning and/or shoring support along the north and west perimeter of the proposed genset excavation may be required due to the existing Foster Pump Station and insufficient space for a sloped excavation. During excavating and preparing the subgrade surface, caution should be taken by the Contractor to avoid influencing the existing footings of the adjacent north building and west retaining wall, and may require that the excavation for preparing the subgrade is completed in stages. In all cases, temporary excavation, underpinning, and shoring systems should be designed and reviewed by a Qualified Geotechnical Engineer. The temporary excavation requirements would be assessed in greater detail as the project advances.

Although significant groundwater seepage was not encountered during the *Geotechnical Exploration*, perched or localized groundwater conditions are possible during wet seasons. Therefore, it is generally recommended that excavation works be completed during or shortly after periods of extended dry weather. If perched or localized groundwater is encountered, it is anticipated that conventional sump and pump methods may be feasible to control the groundwater seepage volumes within the excavation. It is responsibility of the Contractor to protect and provide a dry environment for the placement and



compaction of all fill materials. Contractors should make their own assessment and are responsible for selecting the appropriate methods to control groundwater during construction at these sites.

5.7.2 Site Preparation

In general, site preparation for the proposed genset should include removal of the surface topsoil, the existing fill (Unit A), including the existing concrete, exposing Unit B and allow placement of the recommended pad of *Engineered Fill* placed beneath the new foundation concrete slab/pad. The lateral extent of the concrete is currently not known and should be confirmed prior to site preparation. To restore grade, the excavation should be backfilled with *Engineered Fill*, compacted to at least 95% Modified Proctor Maximum Dry Density (MPMDD).

A minimum 300mm thick pad of *Engineered Fill* is recommended to be placed beneath the foundation. The pad of *Engineered Fill* should extend at least 500mm beyond the edge of the foundation and slope down at a 1(H):1(V) inclination. A 150mm thick bedding or 'blinding' of compacted 19mm clear crushed gravel may be placed on the approved surface *Engineered Fill* Pad to protect it from being disturbed during construction and should be placed in addition to the minimum 300mm fill thickness. The foundation or concrete slab-on-grade may be placed directly on the compacted bedding layer. A layer of 15-mil polyethylene sheeting is recommended to act as a vapor barrier beneath the slab and to protect it from concrete contamination.

The exposed subgrade and compaction works are to be reviewed, tested, and approved by the Geotechnical Engineer, prior to placement of the pad of *Engineered Fill*.

5.7.3 Engineered Fill

Where *Engineered Fill* is required, the material should consist of an approved granular material such as 75mm minus well graded pit-run sand and gravel with no more than 5% fines passing the #200 sieve, or approved equivalent. *Engineered Fill* should extend at least 0.45m beyond the edges of the proposed foundation, or a horizontal distance equal to the thickness of the fill zone, whichever is greater.

All *Engineered Fill* materials must be in placed and compacted in lifts no thicker than 300mm. The material should be near its optimum moisture content and be compacted to at least 95% of the materials' MPMDD value. Field Density Test reports should be forwarded to the Geotechnical Engineer for Review and approval of compacted fill zones. The existing fill is not considered suitable for re-use as *Engineered Fill*.

6.0 ENGINEERING REVIEW, FIELD REVIEW AND QUALITY ASSURANCE TESTING

To sign-off on the work, Kontur must complete the necessary field reviews during the construction stage of the project. Field reviews may be required, but are not limited to, the following stages:

- Review of finalized design details and undertake excavation and shoring design (if required);
- Bulk excavation, stripping and final excavation;
- Subgrade and bearing surface review and approvals;
- Placement and compaction of fills;
- Construction of retaining walls; and/or,
- Installation of perimeter and/or site drainage.



Kontur requires at least 48 hours of advanced notice to visit the site when the work is ready for review.

7.0 CLOSURE

The comments and recommendations presented in this letter are based on the referenced information and Kontur's understanding of the project as described herein. If site conditions or project parameters differ from those described in this letter, Kontur should be notified promptly to review geotechnical aspects of the project and provide additional or modified comments and recommendations, as deemed appropriate. Contractors should make their own assessments of subsurface conditions at this site and select the construction means and methods that are most appropriate for encountered site conditions.

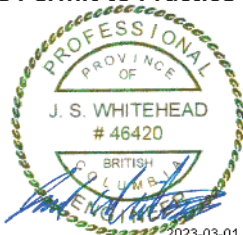
This letter has been prepared for the exclusive use of Water Street Engineering Ltd. and/or their designated agents or consultants. Any use of the information contained in this letter for other than its intended purpose or by any other party must first be verified in writing by Kontur. Kontur does not accept any responsibility or damages because of any other party relying on or using the information, interpretations, opinions, comments, and/or recommendations that are contained in this letter.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

Sincerely,

Kontur Geotechnical Consultants Inc.
EGBC Permit to Practice #1000925

Per:



Jared Whitehead MEng PEng
Project Manager | Geotechnical Engineer

Reviewed by:

Matthew Yip MEng PEng
Principal | Geotechnical Engineer

Attachments: Interpretation and Use of Study and Report Document
Figures 1 to 4
Record of Test Hole Log
2020 National Building Code of Canada Seismic Hazard Tool
Reference Drawings (provided by GEA Ltd.)



INTERPRETATION AND USE OF STUDY AND REPORT DOCUMENT

1.0 STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental engineering or consulting.

2.0 COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3.0 BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4.0 USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5.0 INTERPRETATION OF THE REPORT

Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

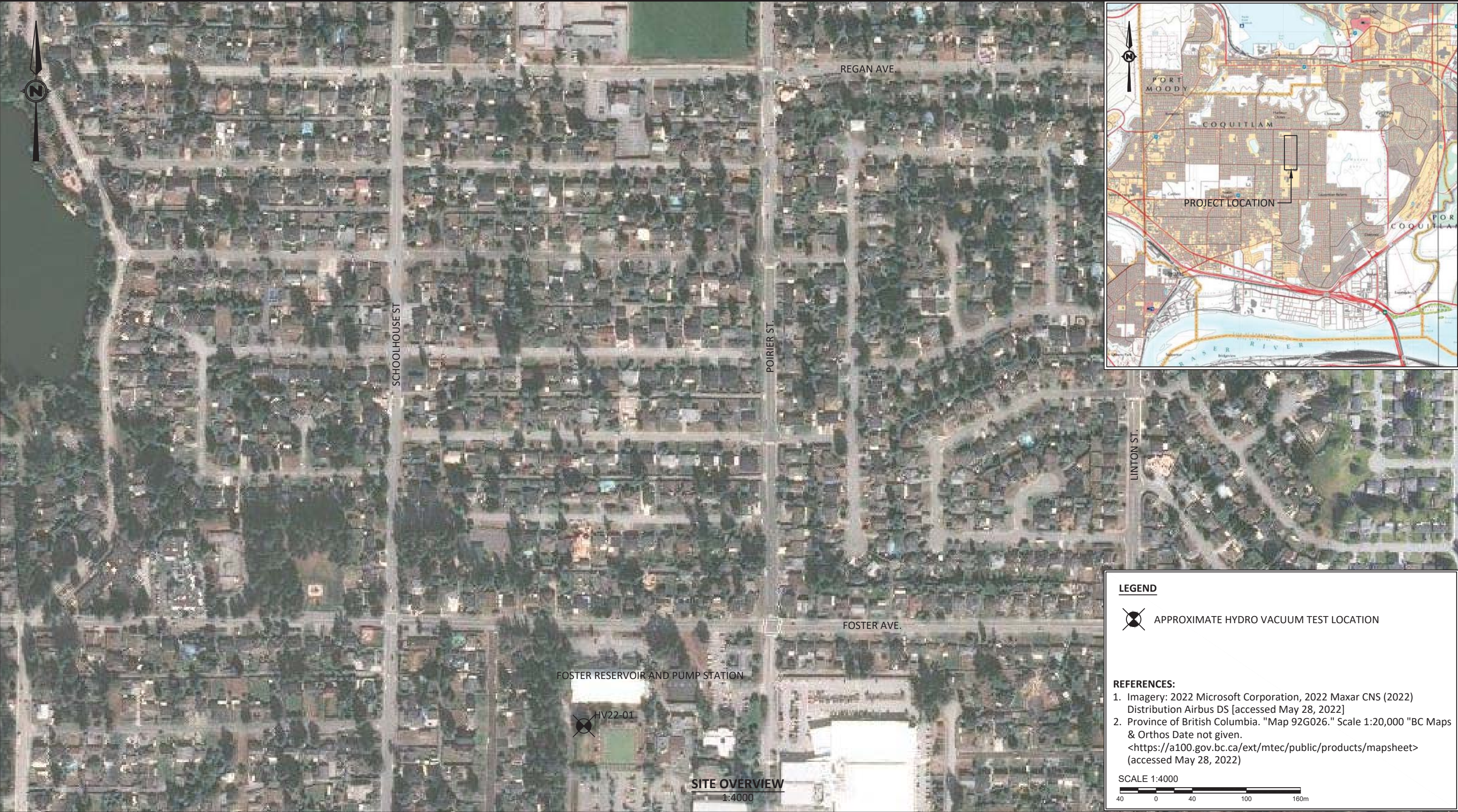
To avoid misunderstandings, KONTUR should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by KONTUR. Further, KONTUR should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with KONTUR's recommendations. Any reduction from the level of services normally recommended will result in KONTUR providing qualified opinions regarding adequacy of the work.

6.0 ALTERNATE REPORT FORMAT

When KONTUR submits both electronic file and hard copies of reports, drawings and other documents and deliverables (KONTUR's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by KONTUR shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by KONTUR shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of KONTUR's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except KONTUR. The Client warrants that KONTUR's instruments of professional service will be used only and exactly as submitted by KONTUR.


The Client recognizes and agrees that electronic files submitted by KONTUR have been prepared and submitted using specific software and hardware systems. KONTUR makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

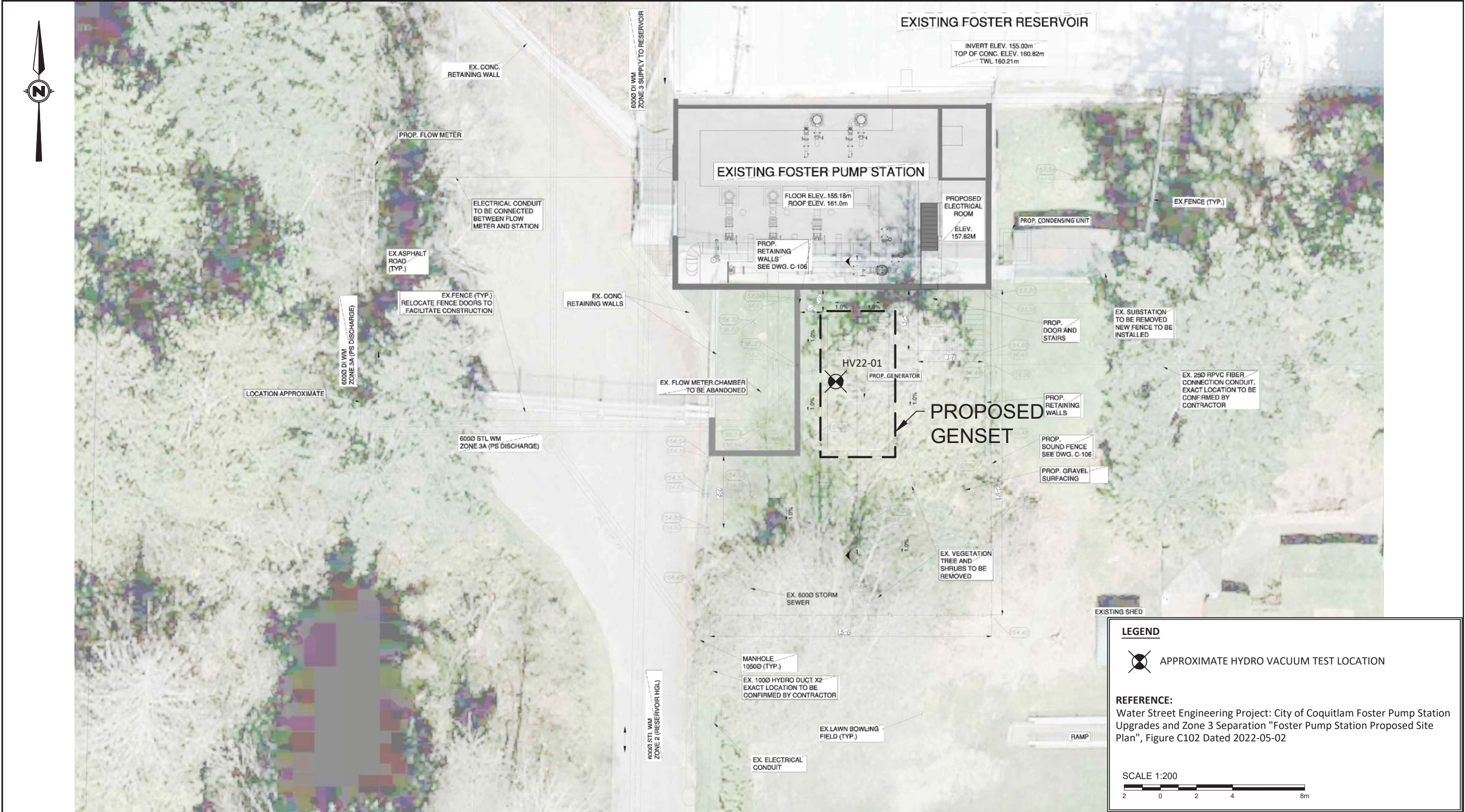



LEGEND
 APPROXIMATE HYDRO VACUUM TEST LOCATION

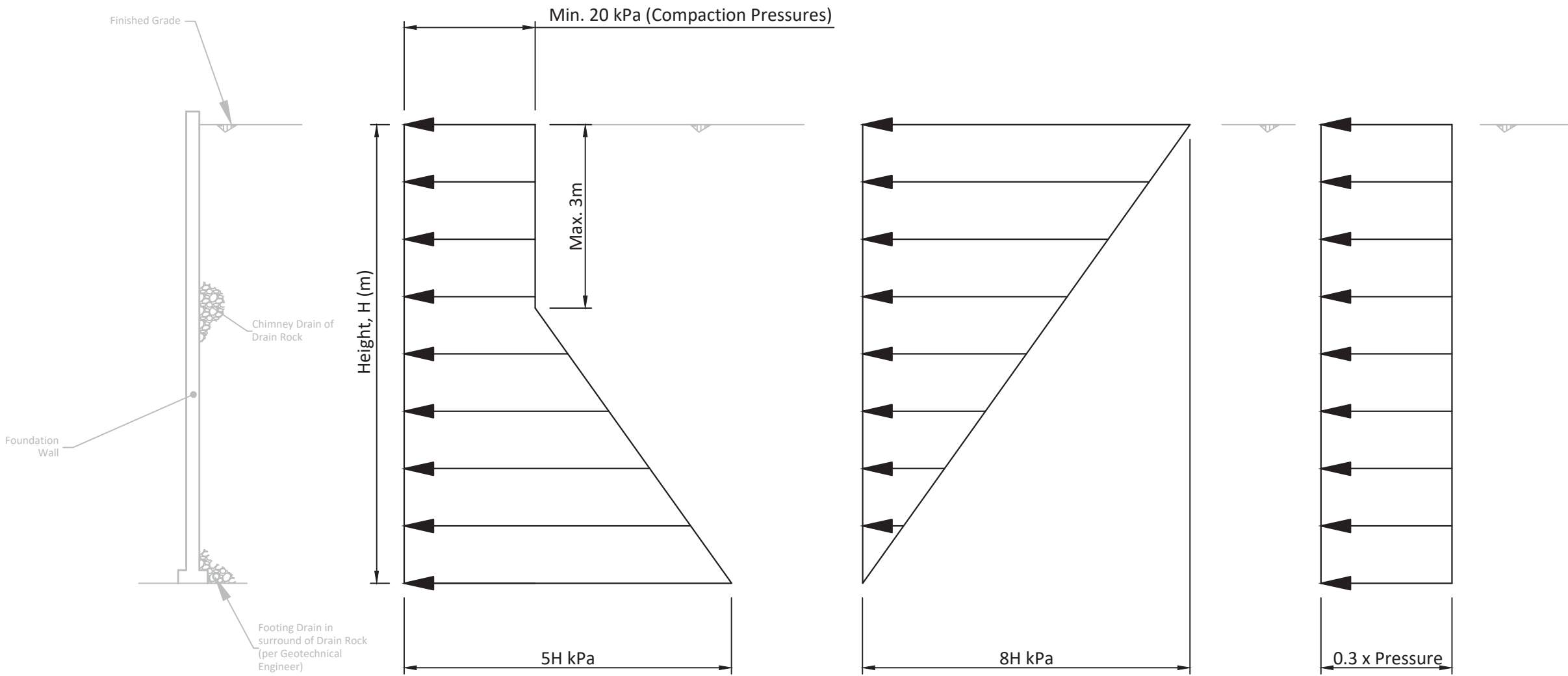
REFERENCES:
1. Imagery: 2022 Microsoft Corporation, 2022 Maxar CNS (2022) Distribution Airbus DS [accessed May 28, 2022]
2. Province of British Columbia. "Map 92G026." Scale 1:20,000 "BC Maps & Orthos Date not given.
<<https://a100.gov.bc.ca/ext/mtec/public/products/mapsheet>> (accessed May 28, 2022)

SCALE 1:4000

 Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5 t. 1 (778) 730 1747 toll-free. +1 (833) 301 7575 e. info@kontur.ca www.kontur.ca	SEAL	VERSIONS			TITLE			PROJECT NO.:		
		NO	DESCRIPTION	DATE	FIGURE 1: SITE VICINITY AND SITE OVERVIEW			K-221162-00		
		0	ISSUED FOR REPORT	2022-07-07	CLIENT WATER STREET ENGINEERING LTD.			DATE:	SCALE:	DWG NO.:
		1	ISSUED FOR REPORT	2023-03-01				2023-03-01	1:4000	FIGURE 1
					PROJECT LOCATION 1650 FOSTER AVE., COQUITLAM, B.C.			DRAFT:	DESIGN:	CHECK:
								SG	AA	JW



<div><p>Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5 t. 1 (778) 730 1747 toll-free. +1 (833) 301 7575 e. info@kontur.ca www.kontur.ca</p></div>	SEAL	VERSIONS			TITLE			PROJECT NO.:		
					FIGURE 2: FOSTER PUMP STATION TEST LOCATION HV22-01			K-221162-00		
		NO	DESCRIPTION	DATE				DATE:	SCALE:	DWG NO.:
		0	ISSUED FOR REPORT	2022-07-07	CLIENT			2023-03-01	1:200	FIGURE 2
		1	ISSUED FOR REPORT	2023-03-01	WATER STREET ENGINEERING LTD.					
					PROJECT LOCATION			DRAFT:	DESIGN:	CHECK:
			1650 FOSTER AVE., COQUITLAM, B.C.			SG	AA	JW		



ASSUMPTIONS AND NOTES

LATERAL EARTH PRESSURE = ① + ② + ③

1. Metric Units (m, kPa)
2. H = Height of Wall
3. All loads are **unfactored**
4. Top-of-wall free to Rotate 0.2% of wall height, H (i.e. Yielding Wall)
5. 1 in 2,475 years Design Earthquake with Peak Ground Acceleration (PGA) taken as **0.43 g**
6. Lateral Earth Pressure acting against wall cannot be less than **20kPa** for compaction-induced pressures
7. Hydrostatic pressures acting against the wall must be added if no foundation drainage (i.e. perimeter/footing drains and chimney drain against foundation walls)
8. Where applicable, **③ surcharge pressures must be added.**

① Static Pressures

② Seismic Pressures

③ Surcharge Pressures

February 15, 2023 2:04:13 PM



Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5
t. 1 (778) 730 1747 | toll-free. +1 (833) 301 7575 | e. info@kontur.ca | www.kontur.ca

SEAL

REVISIONS		
NO	DESCRIPTION	DATE
0	ISSUED FOR REPORT	2023-03-01

TITLE
LATERAL EARTH PRESSURE DIAGRAM (YEILDING WALL)

CLIENT
WATER STREET ENGINEERING LTD.

PROJECT LOCATION
FOSTER PUMP STATION, 1650 FOSTER AVE., COQUITLAM BC

PROJECT NO.:
K-221162-00

DATE:
2023-03-01

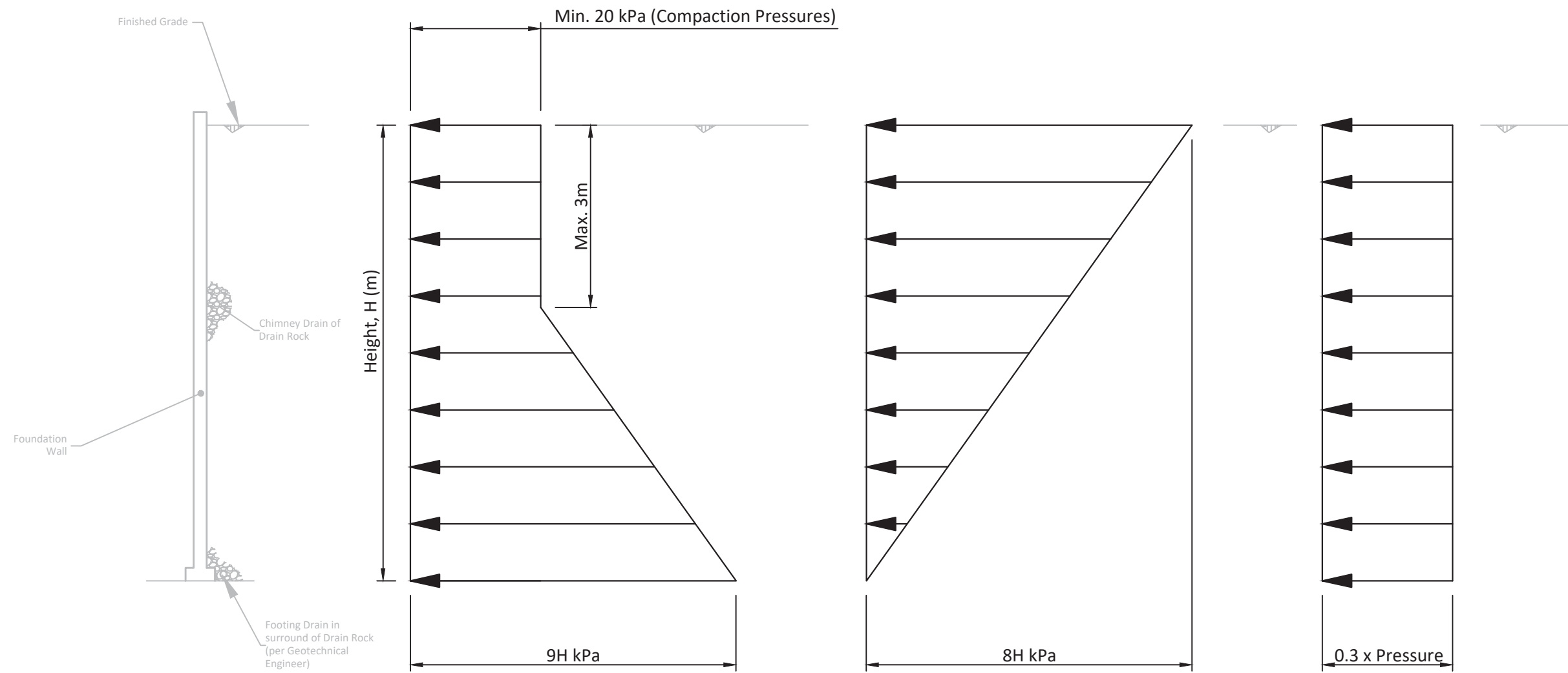
SCALE:
NTS

DWG NO.:
3

DRAFT:
JW

DESIGN:
JW

CHECK:
MY



ASSUMPTIONS AND NOTES

LATERAL EARTH PRESSURE = ① + ② + ③


- 1. Metric Units (m, kPa)
- 2. H = Height of Wall
- 3. All loads are **unfactored**
- 4. Wall does not rotate (At-Rest Condition).
- 5. 1 in 2,475 years Design Earthquake with Peak Ground Acceleration (PGA) taken as **0.43 g**
- 6. Lateral Earth Pressure acting against wall cannot be less than **20kPa** for compaction-induced pressures
- 7. Hydrostatic pressures acting against the wall must be added if no foundation drainage (i.e. perimeter/footing drains and chimney drain against foundation walls)
- 8. Where applicable, **③ surcharge pressures must be added.**

① Static Pressures

② Seismic Pressures

③ Surcharge Pressures

February 15, 2023 2:04:21 PM

<div><p>Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5 t. 1 (778) 730 1747 toll-free. +1 (833) 301 7575 e. info@kontur.ca www.kontur.ca</p></div>	SEAL	REVISIONS			TITLE LATERAL EARTH PRESSURE DIAGRAM (AT-REST CONDITION)		PROJECT NO.: K-221162-00		
		NO	DESCRIPTION	DATE	CLIENT WATER STREET ENGINEERING LTD.		DATE:	SCALE:	DWG NO.:
		0	ISSUED FOR REPORT	2023-03-01			2023-03-01	NTS	4
					PROJECT LOCATION		DRAFT:	DESIGN:	CHECK:
					FOSTER PUMP STATION, 1650 FOSTER AVE., COQUITLAM BC		JW	JW	MY

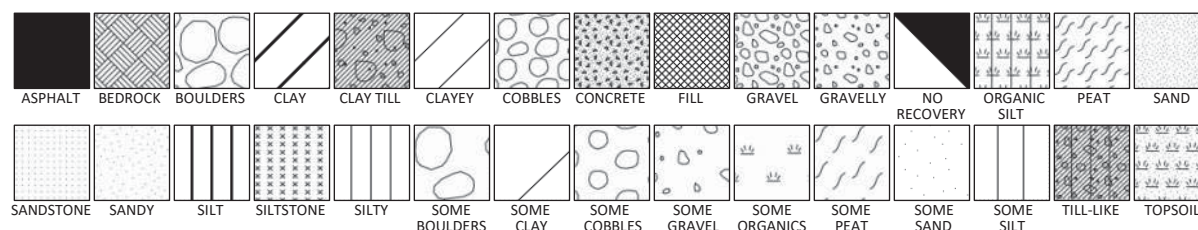
SYMBOLS AND TERMS USED ON TESTHOLE AND TESTPIT RECORDS

SOIL CLASSIFICATION

Standard of Subsurface Soil, Rock, and Groundwater Descriptions

Kontur adheres to the "Canadian Foundation Engineering Manual, 4th Edition, 2006", standard for all soil descriptions in the field and on official testhole/testpit records (logs and reports). Descriptions for each soil type encountered are separated by contact lines at interface depths. Each description has a corresponding graphic symbol that relates to the soil type.

Strata Classification Graphic Symbols



Major Soil Division and Interpretation

The major soil division is the main component of soil and constitutes a minimum 35% by weight, see page 2 for soil types. Where applicable a bracketed term such as (FILL) or (TILL-LIKE) is included to describe soil genesis.

Angularity and Particle Shape

The angularity and shape of coarse particles is described as:

Rounded - Smooth curved sides	Angular - Sharp edges
Subrounded - Well-rounded edges	Flat - Width to thickness ratio > 3
Subangular - Partially rounded edges	Elongated - Length to width ratio > 3

Soil Composition

Terminology used for describing soil strata based on the proportion of individual particle sizes present:

<u>Main soil type</u>	
[>50%]	(NOUN) e.g. SILT, CLAY
[>35%]	(AND) e.g. AND GRAVEL, AND SILT
<u>Subsidiary type</u>	
[20 - 35%]	(ADJECTIVE) e.g. SILTY, CLAYEY
<u>Minor soil type</u>	
[10 - 20%]	("some") e.g. some sand, some silt
[1 - 10%]	("trace") e.g. trace sand, trace silt

Relative Density and Consistency

The following terms are used to describe the compactness of coarse-grained soils based on the Standard Penetration Test (SPT) or field estimates:

<u>Description Term</u>	<u>SPT 'N' Value</u>
Very loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very dense	> 50

The following terms are used to describe the consistency of fine-grained soils based on undrained shear strength and the Standard Penetration Test (SPT) or field estimates:

<u>Description Term</u>	<u>SPT 'N' Value</u>	<u>Undrained Shear Strength (kPa)</u>
Very soft	< 2	< 12
Soft	2 - 4	12 - 25
Firm	4 - 8	25 - 50
Stiff	8 - 15	50 - 100
Very stiff	15 - 30	100 - 200
Hard	> 30	> 2

Moisture Condition

Coarse-Grained Soils:

Dry	Absence of moisture, dusty
Damp	Not dry to the touch
Moist	Moisture evident, no visible free water
Wet	Visible free water

Fine-Grained Soils:

W < PL	Material is drier than plastic limit
W ~ PL	Material is close to plastic limit
W > PL	Material is wetter than plastic limit

RECORD OF TESTHOLE : HV22-01

PAGE 1 OF 1



Kontur Geotechnical Consultants
Unit 107, 2071 Kingsway Avenue
Port Coquitlam, BC V3C 6N2
Telephone: (778) 730-1747

CLIENT Water Street Engineering
PROJECT NAME Foster Pump Station Upgrade
DRILLING DATE 2022-05-19
DRILLING METHOD Hydro-Vac
DRILLING CONTRACTOR McCrae's Environmental Services Ltd.
EQUIPMENT TYPE Hydrovac Truck

PROJECT NUMBER K-221162-00
PROJECT LOCATION 640 Poirier Street, Coquitlam
TESTHOLE LOCATION N: 5455834 E: 510974
ELEVATION 156.5m (approximate)
▽ GROUNDWATER DEPTH AT TIME OF DRILLING _____
LOGGED BY AA CHECKED BY JYT

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES			SPT 'N' VALUE BLOWS/0.3m ▲	POCKET PEN. (kPa) ●	FINES CONTENT (%) □	GROUNDWATER
				NUMBER	TYPE	RECOVERY %	20 40 60 80	100 200 300 400	20 40 60 80	
							DYNAMIC CONE BLOWS/0.3m ■		PLASTIC & LIQUID LIMIT WATER CONTENT PL MC LL 20 40 60 80	
1		(TOPSOIL) SILTY SAND, trace gravel, grass, brown, moist, (loose to compact)	156.3	S1	GB					
		(FILL) SILTY SAND, some gravel, occasional cobbles, brown to grey, (loose to compact), mixed fill	0.2							
2		(CONCRETE), grey, (dense)	155.0	S2	GB					
			1.5	S3	GB					
		(FILL) SILTY SAND, trace to some gravel, some cobbles, grey, (dense to very dense), clean fill	154.8	S4	GB					
	1.7									
3			153.8	S5	GB					
		(SILTY SAND), some gravel, some cobbles, grey, (compact to dense), (till-like)	2.7							
4				152.2	S6	GB				

Bottom of hole at 4.3m.

2020 National Building Code of Canada Seismic Hazard Tool

i This application provides seismic values for the design of buildings in Canada under Part 4 of the National Building Code of Canada (NBC) 2020 as prescribed in Article 1.1.3.1. of Division B of the NBC 2020.

Seismic Hazard Values

User requested values	
Code edition	NBC 2020
Site designation X_s	X_c
Latitude (°)	49.255
Longitude (°)	-122.849

Please select one of the tabs below.

- NBC 2020
- Additional Values
- Plots
- API
- Background Information

The 5%-damped spectral acceleration ($S_a(T,X)$, where T is the period, in s, and X is the site designation) and peak ground acceleration ($PGA(X)$) values are given in units of acceleration due to gravity (g, 9.81 m/s²). Peak ground velocity ($PGV(X)$) values are given in m/s. Probability is expressed in terms of percent exceedance in 50 years. Further information on the calculation of seismic hazard is provided under the *Background Information* tab.

The 2%-in-50-year seismic hazard values are provided in accordance with Article 4.1.8.4. of the NBC 2020. The 5%- and 10%-in-50-year values are provided for additional performance checks in accordance with Article 4.1.8.23. of the NBC 2020.

See the *Additional Values* tab for additional seismic hazard values, including values for other site designations, periods, and probabilities not defined in the NBC 2020.

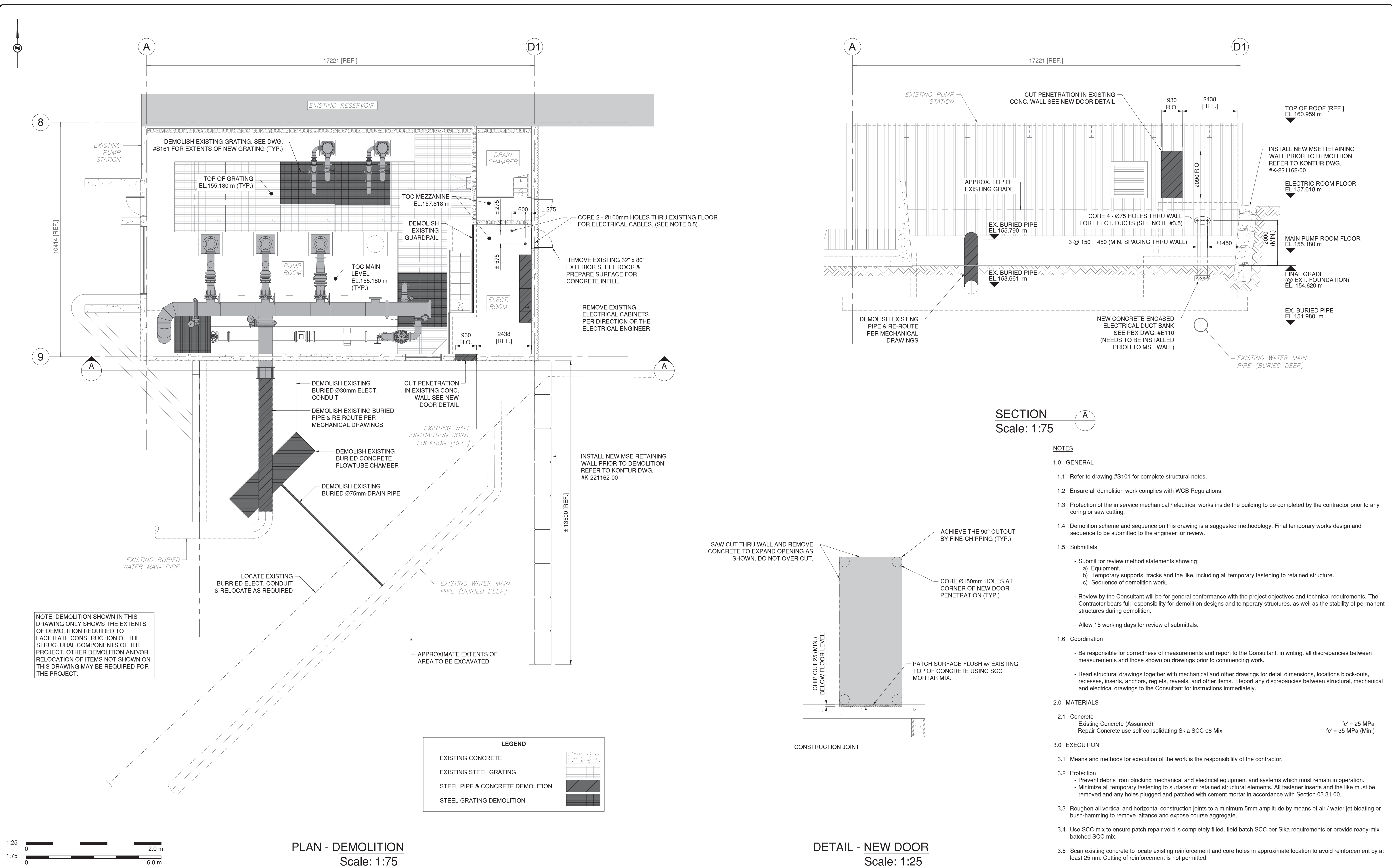
NBC 2020 - 2%/50 years (0.000404 per annum) probability							
$S_a(0.2, X_c)$	$S_a(0.5, X_c)$	$S_a(1.0, X_c)$	$S_a(2.0, X_c)$	$S_a(5.0, X_c)$	$S_a(10.0, X_c)$	$PGA(X_c)$	$PGV(X_c)$
1	0.796	0.464	0.281	0.0818	0.0352	0.434	0.483

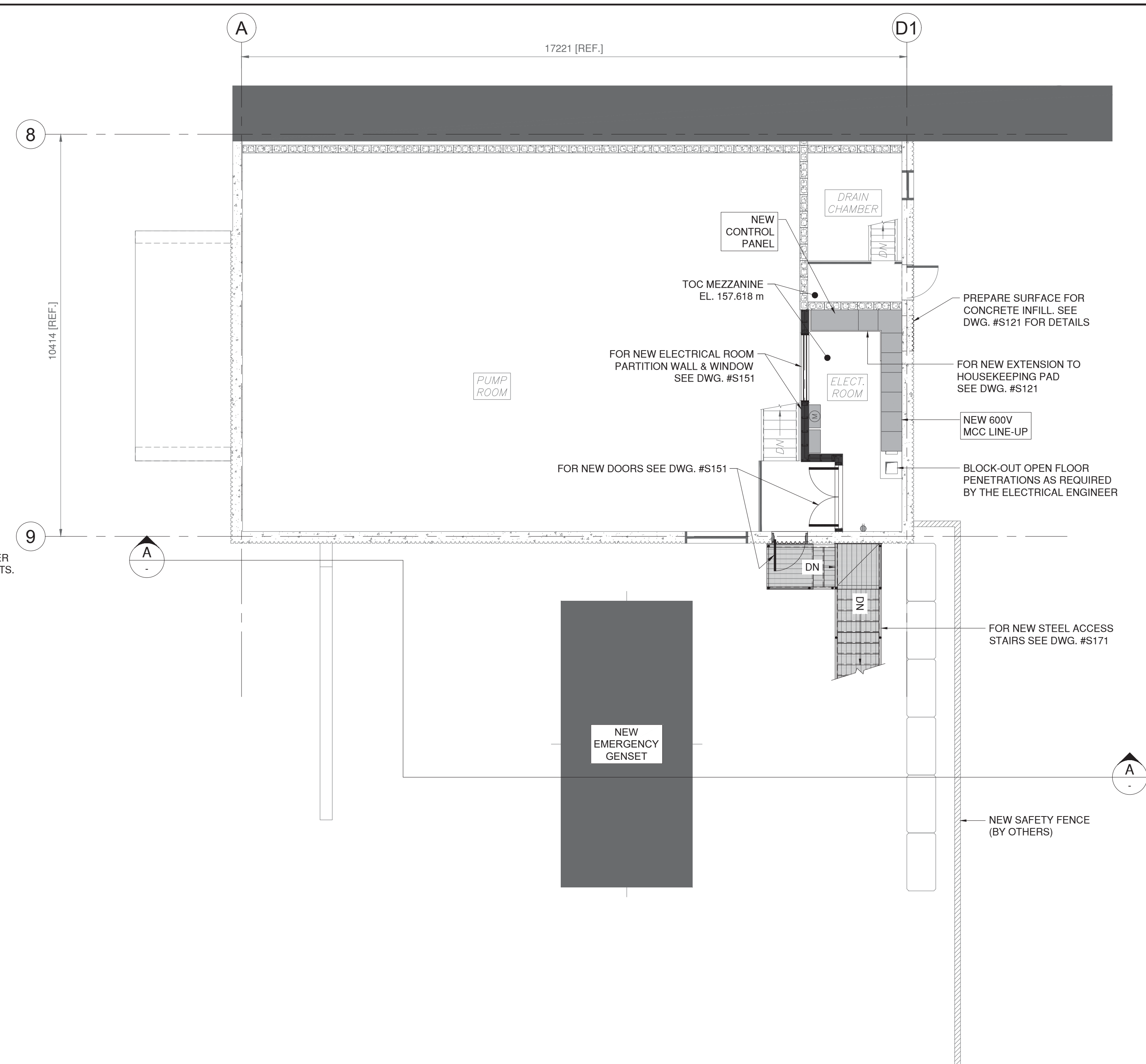
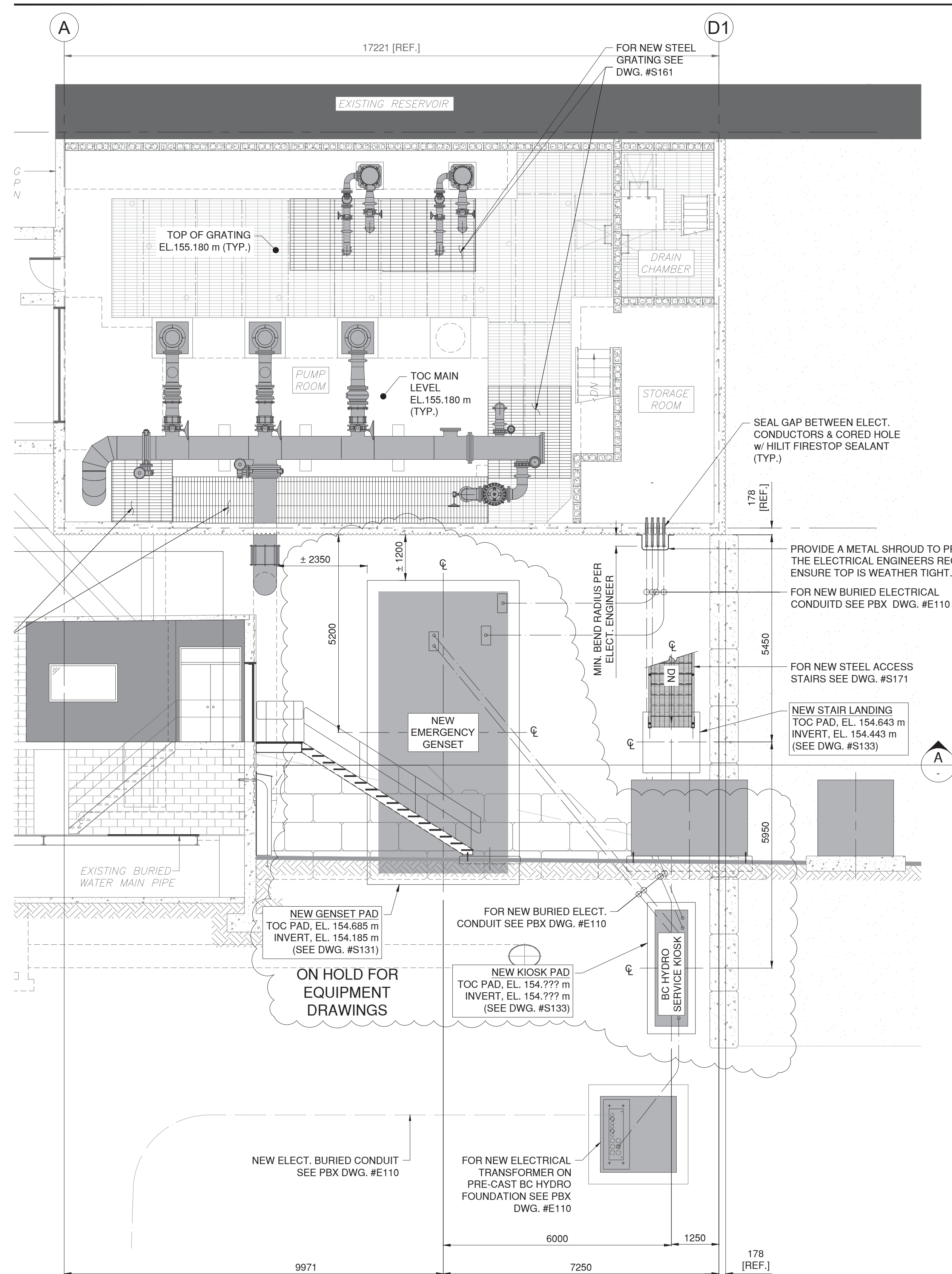
The log-log interpolated 2%/50 year $S_a(4.0, X_c)$ value is : **0.1105**

- Tables for 5% and 10% in 50 year values
- Download CSV

◀ Go back to the [seismic hazard calculator form](#)

Date modified: 2021-04-06





STRUCTURAL NOTES.

2.0 m
6.0 m

PLAN - STRUCT. ARRANGEMENT (MAIN LEVEL)

Scale: 1:75

PLAN - STRUCT. ARRANGEMENT (MEZZANINE LEVEL)

Scale: 1:75

and BC one call
3s and

GEA Gyax
Engineering
Associates Ltd.

103-1718 COMMERCIAL DR., VANCOUVER, BC V5K 2Y2
TEL: (1) 604-254-3914 EMAIL: mail@gea.ca
GEA PROJECT: 21003

DRAFT

No.	Date	By	Revisions
B	???	TL	ISSUED FOR FINAL REVIEW
A	NOV 18, 2022	AG	ISSUED FOR 90% REVIEW

Coquitlam

Engineering & Public Works
3000 Guildford Way, Coquitlam, B.C. V3B 7N2

PERMIT TO PRACTICE

Signature: _____

Date: _____

PERMIT NUMBER: _____

The Association of Professional Engineers
and Geoscientists of British Columbia

Seal:

PRELIMINARY
NOT FOR CONSTRUCTION

Design by	RJ	Date	2022-10-10
Drawn by	TL	Date	2022-05-20
Checked by	AG	Date	2022-11-16
Approved by	-	Date	-

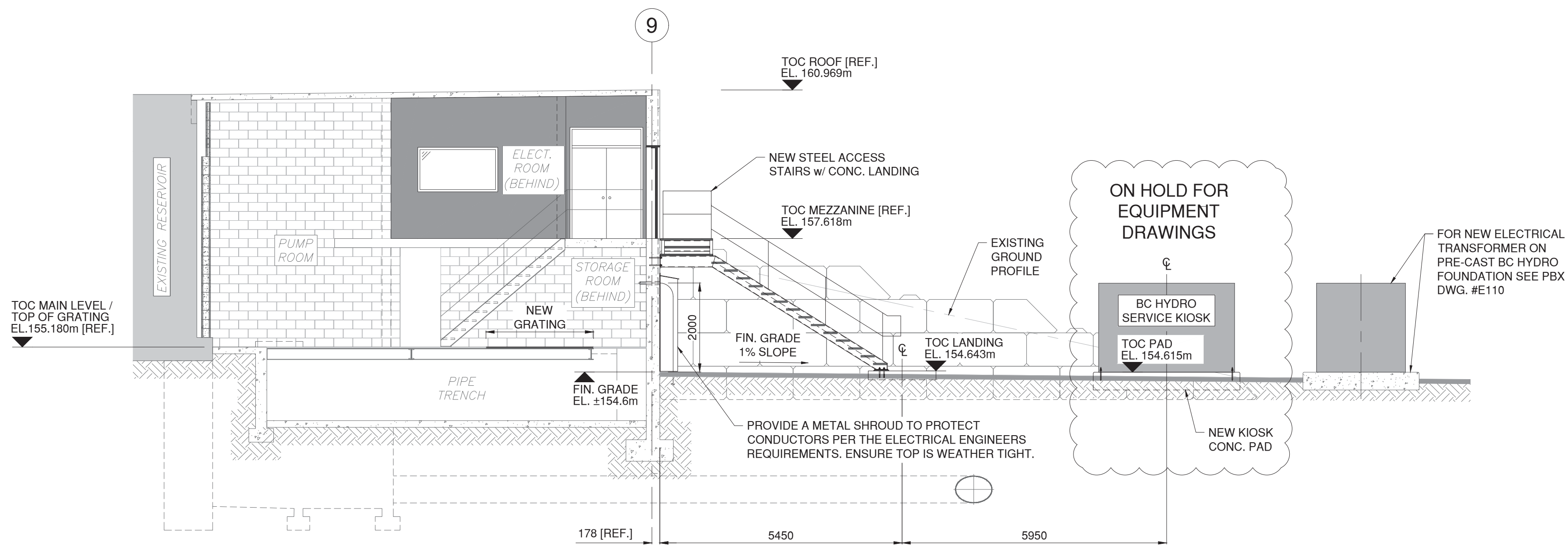
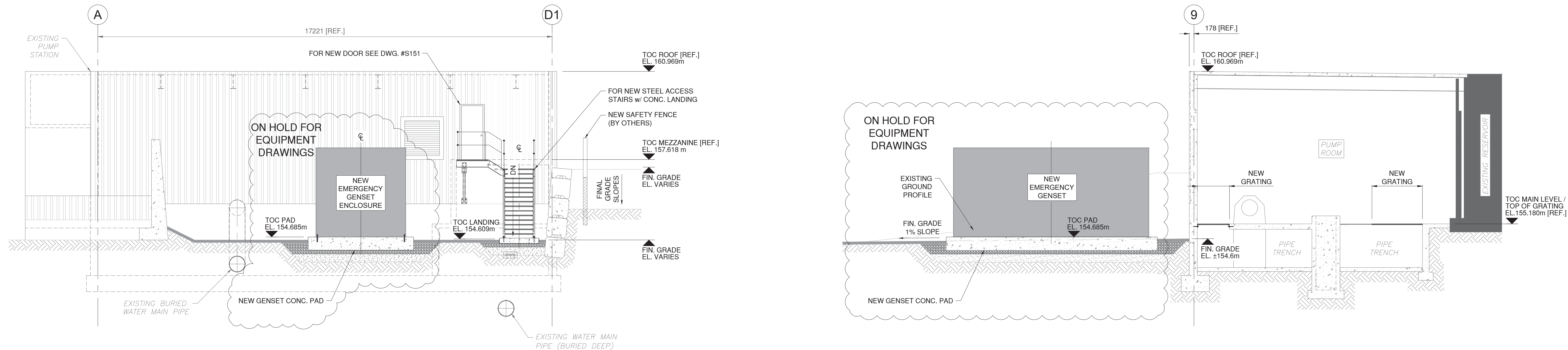
Scale	AS NOTED
Sheet of	
Eng. Project No.	87422

Project **CITY OF COQUITLAM
FOSTER PUMP STATION UPGRADES**

Description **STRUCTURAL ARRANGEMENT
OVERALL LAYOUT - PLANS**

File: S111,121,151_Foster PS_working_current

S111



NOTES:

1. REFER TO DRAWING #S101 FOR STRUCTURAL NOTES.



Benchmark:

Note:
Contractor to contact Telus, BC Hydro, FortisBC and BC one call prior to construction to confirm locations of utilities and appurtenances requiring adjustment.

Plot Date: March 1, 2023

Gyax Engineering Associates Ltd.

103-1718 COMMERCIAL DR. VANCOUVER, BC V5K 2Y2
TEL: (1) 604-254-3914 EMAIL: mail@gyax.ca

GEA PROJECT: 21003

DRAFT

A ??? TL ISSUED FOR FINAL REVIEW
No. Date By Revisions

Coquitlam

Engineering & Public Works

3000 Guildford Way, Coquitlam, B.C. V3B 7N2

PERMIT TO PRACTICE

Signature: _____

Date: _____

PERMIT NUMBER: _____
The Association of Professional Engineers and Geoscientists of British Columbia

Seal:

PRELIMINARY
NOT FOR CONSTRUCTION

Design by RJ Date 2022-10-10
Drawn by TL Date 2022-05-20
Checked by AG Date 2022-11-16
Approved by - Date -

Scale AS NOTED
Sheet of
Eng. Project No. 87422

Project **CITY OF COQUITLAM
FOSTER PUMP STATION UPGRADES**

Description **STRUCTURAL - ARRANGEMENT
SECTIONS**

File: S111,121,151_Foster PS_working_current

S112