



Request for Tenders
For
Roper Reservoir Inlet Modifications &
Everall PRV Chamber Installation
City of White Rock
Contract WR19-009

Issued: **Thursday, July 25th, 2019**

Submission Deadline: **Monday, August 26th, 2019 @ 2:00 pm PST**

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PART 1 – REQUEST FOR TENDERS AND SUBMISSION INSTRUCTIONS

1.1 Request for Tenders

This Request for Tenders (the “**RFT**”) by the City of White Rock (the “**City**”) is to prospective Proponents (“**Proponents**”) to submit Tenders for the White Rock Contract for construction works at the following sites. Site 1: Roper Reservoir Inlet Modifications, and Site 2: Everall PRV Chamber Installation Construction. These are further described below and in the work specifications in Appendix C (the “**Work**”).

Site 1: Roper Reservoir is located at 15243 Roper Avenue, White Rock. As part of the Water System Master Plan, the City intends to improve mixing in this Reservoir by modifying the inlet piping and control valves.

The Roper Reservoir was constructed in 1971 with a common inlet and outlet pipe, and currently “floats” on the system due to valve control and arrangement. This is undesirable due to the following:

- During periods of high demand, water flowing from the Roper Control Valve Station could completely bypass the Roper Reservoir, greatly reducing the available disinfection contact time.
- During periods of low demand, the Roper Reservoir would be filled. Due to the common inlet/outlet line, stagnation of the water within the Reservoir is possible, which in turn will reduce the impact and effectiveness of disinfection residuals.

To overcome these issues, the City intends to construct a dedicated inlet and outlet line to the Roper Reservoir to increase water turn over, and modify the existing Roper Control Valve Station to allow for batch filling and emptying of the Roper Reservoir, including installation of a new electronic Flow Control Valve.

In order to undertake these modifications, the successful **Proponent** will install a new inlet piping assembly to the reservoir, and conduct modifications to piping in the Roper Reservoir PRV station. This includes installation of a 150 (6”) Flow Control Valve and relocation of an existing 150 (6”) Check Valve. The full scope of works includes:

- Executing the responsibilities of the Prime Contractor including but not limited to health and safety, traffic management, public notification and quality assurance and quality control
- Obtaining all necessary permits (municipal, provincial, health authority or otherwise) for the works
- All excavation, trenching, backfill and compaction works, as shown on the contract drawings and necessary for a complete installation
- Installation of new inlet assembly, including all associated piping, valves, instrumentation and appurtenances, as described in Appendix C. All works occurring inside of the Roper Reservoir building are to be coordinated with the City to occur during regular maintenance when the Roper Reservoir is drained.
- Modifications to existing control building as described in Appendix C
- Installation of all electrical equipment including wiring, programming and appurtenances
- Integration of the new equipment into the City’s SCADA system
- Coordination with the Owner’s Engineer and the City for testing, disinfection, inspection and start-up of all systems
- All other works shown on the contract drawings and necessary for a complete installation

- As the Roper Reservoir is a post-disaster structure, all improvements will be constructed in accordance with the BC Building Code
- All as-built drawings and close-out documentation
- All required road and surface restoration

Site 2: The Everall PRV Chamber Installation is required to divide an existing High Pressure Zone into two (2) zones. West of Everall Street (including Everall Street) the pressure will be reduced (High Zone West, 135 meters of pressure) and east of Everall Street the pressure will be increased (High Zone East, 145 meters of pressure). The changes are being undertaken to improve circulation through the system, prevent areas of stagnation and ensure adequate supply of water for domestic and fire fighting use throughout both zones.

In order to divide the high pressure zone, the successful **Proponent** will install a new Pressure Reducing Valve (PRV) on Everall Street, south of the intersection with North Bluff Road, in the City of White Rock. The full scope of works includes:

- Executing the responsibilities of the Prime Contractor including, but not limited to, health and safety, traffic management, public notification and quality assurance and quality control
- Obtaining all necessary permits (municipal, provincial, health authority or otherwise) for the works
- Coordinating with BC Hydro for a new electrical service to feed the PRV station
- All excavation, trenching, backfill and compaction works, as shown on the contract drawings and necessary for a complete installation
- Installation of a sub-surface PRV chamber, including all associated piping, valves, instrumentation and appurtenances
- Installation of two new blow-off valves
- Connections to existing subsurface watermain on North Bluff Road and Everall Street
- Installation of all electrical equipment including wiring, programming and appurtenances
- Integration of the new equipment into the City's SCADA system
- Coordination with the Owner's Engineer and the City for testing, disinfection, inspection and start-up of all systems
- All surveying as required for unit price pay items and as-built documentation
- All as-built drawings and close-out documentation
- All required road and surface restoration
- All other works shown on the contract drawings and necessary for a complete installation

1.1.1 Definitions

In this RFT, the following definitions apply:

1. **"Bid Bond"** means the security to accompany the Tender as required by Section 1.5.8 of this RFT
2. **"Closing"** means the Submission Deadline
3. **"Contract"** means the contract described in Section 1.3 of this RFT
4. **"Contract Administrator"** shall have the same definition as the **"Owner's Engineer"**
5. **"Contractor"** means the successful Tenderer who enters into a Contract with the City

- .6 **“Owner’s Engineer”** means GHD Limited, who will be operating on behalf of the City in executing this Tender and providing quality control/quality assurance and construction contract administration services for the Works
- .7 **“Owner”** or **“the City”** means the City of White Rock.
- .8 **“Proponent”** shall have the same definition as **“Tenderer”**
- .9 **“Tender”** means a Tender submitted in response to the RFT in accordance with Section 1.5.1 of this RFT
- .10 **“Tenderer”** means the person or entity submitting the Tender. The Tenderer means the Tenderer or Tenderer’s authorized representative.
- .11 **“Tender Price”** means the total monetary sum identified by the Proponent on the Submission Form
- .12 **“RFT”** means this Request for Tenders
- .13 **“RFT Contact”** means the person identified in Section 1.2 of this RFT or their successor
- .14 **“RFT Documents”** means this RFT and all appendices and addenda
- .15 **“Submission Deadline”** has the meaning described in Section 1.4 of this RFT
- .16 **“Submission Form”** means the Submission Form described in Section 1.5.1 of this RFT
- .17 **“Work”** means construction work associated with the Roper Reservoir Inlet Modifications & Everall Street PRV Chamber Installation, as described above and in Appendix C of this RFT

1.1.2 RFT Documents and Due Diligence

- .1 RFT Documents are made available only for the purpose of obtaining Tenders for this RFT. Their use does not confer a license or grant for other purposes.
- .2 Upon receipt of RFT Documents, verify that documents include all pages and attachments indicated by the Table of Contents. Notify RFT Contact should the documents be incomplete.
- .3 The Proponent is required to satisfy itself by personal examination of the place of the Work and of the RFT Documents as to the provisions of the Contract, and to fully inform itself prior to submitting a Tender regarding the following: conditions and limitations under which the Work is to be performed, the conditions which may be encountered, the materials that the Contractor will be required to supply, and other materials which are required in carrying out the Contract to a satisfactory conclusion. No claims will be entertained based on any assertion by the Proponent that the Proponent was not aware of the provisions or conditions intended to be covered by the Contract.

1.1.3 Resolution of Discrepancies and Ambiguities

- .1 If a Proponent finds discrepancies in, or omissions from the RFT Documents, or if a Proponent is in doubt as to their meaning, the Proponent should contact the RFT Contact immediately in writing. Should addenda to the RFT Documents be required for any reason, it is the City's intention not to issue addenda during a period three days prior to the Submission Deadline. All addenda become part of the Contract.
- .2 Requests for clarification must be in writing and received by the RFT Contact six (6) business days before the date of Closing.
- .3 No oral interpretations will be effective to modify the provisions of the Tender or Contract.

1.2 RFT Contact

For the purposes of this procurement process, the contact person (the “**RFT Contact**”) will be:

Mr. Birk Madsen, ASc.T.
Engineering Technologist
City of White Rock
604-541 2192
E-Mail: bmadsen@whiterockcity.ca

Proponents and their representatives are not permitted to contact any employees, officers, agents, elected or appointed officials or other representatives of the City, other than the RFT Contact, concerning matters regarding this RFT. Failure to adhere to this rule may result in the disqualification of the Proponent and the rejection of the Proponent's Tender.

1.3 Type of Contract for Work

The successful Proponent will be required to enter into a **CCDC4 - Unit Price Contract** with the City for the provision of the Work, which shall include the supplementary terms and conditions detailed in Appendix A to this RFT along with all addenda (the “**Contract**”). It is the City's intention to enter into the Contract with only one (1) legal entity. An example of the contract can be found in Appendix D.

1.4 RFT Timetable

The timetable for this RFT consists of the following events, dates and times.

Issue Date of RFT	Thursday, July 25, 2019
Mandatory Site Visit	Wednesday, July 31, 2019 at 10:00 am
Deadline for Questions	Friday, August 16, 2019
Submission Deadline	Monday, August 26, 2019 at 2:00 PM PST
Anticipated Contract Award	Monday, September 9, 2019
Substantial Completion Date, Site 1	Friday, November 29, 2019
Total Completion Date, Site 1	Wednesday, December 11, 2019
Substantial Completion Date, Site 2	Friday, January 24, 2020
Total Completion Date, Site 2	Friday, January 31, 2020

The RFT timetable is tentative only and may be changed by the City at any time.

1.4.1 Mandatory Site Visit

All Proponents will be required to attend the mandatory site visit. Interested Proponents must meet at the Operations Meeting Room located at 877 Keil Street, White Rock, British Columbia on **July 31, 2019 at 10:00 am**. Each Proponent is permitted to have a maximum of three (3) representatives attend at the site visit.

1.5 Submission of Tenders

Tenders submitted in response to this RFT must be in accordance with this section.

1.5.1 Tenders to be submitted in Prescribed Form

1. Tenders must be submitted in the Submission Form attached as Appendix B along with all schedules consisting of:

Schedule A: Proponent's Experience, Reputation and Qualifications

Schedule B: Proponent's Work Plan and Methodology

Schedule C: Proponent's Work Schedule

Schedule D: Proponent's Pricing for Work

Schedule E: Proponent's Pricing for Additions and Deletions

(the "**Tender**").

Other than inserting the information requested on the mandatory Submission Form set out in this RFT, a Proponent may not make any changes to any of the forms. Any Tender containing any such changes, whether on the face of the form or elsewhere in the Tender, may be disqualified.

2. Tenders shall be typewritten or made in ink. Penciled entries or changes will not be considered.

- .3 Tenders shall be in Canadian dollars and shall include all labour, material, freight, customs, and excise duties, and all applicable municipal, provincial and federal taxes, except GST, in effect on the date of Closing. The cost of bonding should be listed as an individual item and included in the Bid Price.
- .4 Tenders shall be for the entire Work described in this RFT, including inspection and testing by qualified independent agencies as specified.
- .5 Tenders shall be firm for the duration of the Contract, and be unaffected by escalations in costs of wages and materials.
- .6 Tenders shall be executed under seal by the hands of the Proponent's duly authorized officers. The City may require proof of authority to execute the Tender, in the form of a certified copy of a resolution naming the person or persons in question as authorized to sign the Tender for and on behalf of the corporation or partnership.
- .7 The successful Proponent must obtain all necessary permits and the cost of permits shall be to the Contractor's account.
- .8 The successful Proponent is required to obtain a City of White Rock business license prior to Notice to Proceed.
- .9 An example of the Notice of Award and Notice to Proceed documents are provided for reference in Appendix D.

1.5.2 Tenders to be Submitted at Prescribed Location

Tenders must be submitted at:

**City of White Rock
877 Keil Street,
White Rock, British Columbia V4B 1Y6
Attention: Birk Madsen, Engineering Technologist**

1.5.3 Tenders to be Submitted on Time

Tenders must be submitted at the location set out above, on, or before, the Submission Deadline. Tenders submitted after the Submission Deadline will be rejected. Onus and responsibility rest solely with the Proponent to deliver its Tender to the exact location (including floor, if applicable) indicated in this RFT on or before the Submission Deadline. The City does not accept any responsibility for Tenders delivered to any other location by the Proponent or its delivery agents. Proponents are advised to make submissions well before the Submission Deadline. Proponents making submissions near the Submission Deadline do so at their own risk.

Proponents are advised to allow at least 48 hours to ensure Tenders are delivered on time. The City assumes no responsibility for any failure by a Proponent to submit a Tender in accordance with this RFT.

1.5.4 Tenders to be Submitted in Prescribed Format

Proponents must submit **two (2) hard copies** and **one (1) electronic copy** consisting of a single PDF file on USB, enclosed in a sealed package. If there is a conflict or inconsistency between the hard copy and the electronic copy of the Tender, the hard copy of the Tender will prevail. Tenders should be prominently marked with the RFT title and number (see RFT cover page), with the full legal name and return address of the Proponent.

1.5.5 Amendment of Tenders

Proponents may amend their Tenders prior to the Submission Deadline by submitting the amendment in a sealed package prominently marked with the RFT title and number and the full legal name and return address of the Proponent to the location set out above. Any amendment should clearly indicate which part of the Tender the amendment is intended to amend or replace. Amended Tenders should also be submitted in the number and format described in section 1.5.4 above.

1.5.6 Withdrawal of Tenders

Proponents may withdraw their Tenders prior to the Submission Deadline. To withdraw a Tender, a notice of withdrawal must be sent to the RFT Contact prior to the Submission Deadline and must be signed by an authorized representative of the Proponent. The City is under no obligation to return withdrawn Tenders.

1.5.7 Tenders Irrevocable after Submission Deadline

Tenders shall be irrevocable for a period of 60 days running from the moment that the Submission Deadline passes.

1.5.8 Bonding Requirements for Tenders

- .1 Each Tender shall be accompanied by security in the form of a Bid Bond in the amount of 10% of the Tender Price, made payable to the City. The Bid Bond shall be with a Surety company licensed to transact business in the Province of British Columbia.
- .2 Submit with the Bid Bond a Consent of Surety stating that the surety company providing the Bid Bond is willing to supply the Performance Bond and Labour and Materials Payment Bond required.
- .3 The Bid Bond will be returned after delivery to the City of the required Performance Bond and Labour and Materials Payment Bond by the accepted Proponent.
- .4 The security of unsuccessful Proponents will be returned without interest within 90 days from the date of Closing.
- .5 If any Proponent withdraws its Tender after the Closing time on the stipulated date and before or after receiving notification that its Tender has been accepted by the City or if the accepted Proponent fails to execute the Contract or to provide the bonds required herein when called upon to do so, its security shall be forfeited, without recourse and without limiting the City's other legal rights and remedies against that Proponent.

1.5.9 Bonding Requirements for Successful Proponent

The accepted Proponent shall furnish a Performance Bond and Labour and Materials Payment Bond in accordance with the following:

- .1 The accepted Proponent shall provide a Performance Bond and a Labour and Material Payment Bond each in the amount of 50% of the Contract Price.
- .2 These bonds must be provided within ten (10) days of Contract award and must be maintained in good standing until the fulfillment of the Contract including the requirements of the warranty as provided for in GC 24 - Warranty and the payment of all obligations arising under the Contract. Should the accepted Proponent fail to provide these required bonds the Bid Bond may be forfeited.
- .3 All such bonds shall be issued on a form approved by the Insurance Bureau of Canada and issued by a duly licensed Surety authorized to transact business in the province or territory of the Place of the Work and shall be maintained in good standing until the fulfillment of the Contract.
- .4 The costs attributed to providing such bonds shall be included in the Bid Price.
- .5 The obligee on the bonds shall be the City of White Rock.

1.5.10 Alternative products or materials

If, for any reason, the Proponent should propose to use alternative products or materials which, in the Proponent's opinion, would improve the Work or reduce the cost of the Work, the Proponent shall:

- .1 Base a first Tender on the exact requirements of the Tender Documents;
- .2 Submit a second Tender describing in full detail the different products or materials the Proponent is proposing and the reasons for the proposed substitution;
- .3 The second Tender shall provide sufficient information to enable the Owner to determine acceptability of the proposed substitution(s) and include complete information, including the dollar amount of additions to or reductions from the Tender Price, of required revisions to other Work to accommodate each substitution. A later claim by the Proponent for an addition to the Contract Price because of changes in the Work necessitated by use of alternative or substitute Products will not be considered.

The Owner may accept or reject any such Tender, without explanation.

1.6 Tender Openings

1.6.1 Private Opening of Tenders

Tenders will be opened in private after the Closing.

1.6.2 Disqualification of Tenders

- .1 Tenders which are incomplete, conditional, illegible or obscure, or that contain additions not called for, reservations, erasures, alterations or irregularities of any kind, may be rejected.

- .2 Tender not accompanied by a completed Submission Form, Bid Bond, Bid Deposit and Consent of Surety as specified herein may be rejected.
- .3 Tenders may be rejected if the pricing for Work appears to be so unbalanced that it may adversely affect the interest of the City.
- .4 Tenders may be rejected if they are based on an unreasonable period of time for the completion of the Work.

[End of Part 1]

PART 2 – EVALUATION AND AWARD

2.1 Evaluation Criteria

The evaluation of Tenders will be undertaken on behalf of the City by an evaluation team. The evaluation team may consult with others, including City staff members, third-party contractors and references, as the evaluation team may in its discretion decide is required.

The evaluation team will compare and evaluate all Tenders to determine each Proponent's strength and ability to provide the goods or services in order to determine the Tender which is most advantageous to the City, using the following criteria:

- (a) Experience, Reputation and Qualifications;
- (b) Work Plan and Methodology;
- (c) Work Schedule; and
- (d) Pricing for Work.

The evaluation team will not be limited to the criteria referred to above, and may consider other criteria that the team identifies as relevant during the evaluation process. All criteria considered by the evaluation team will be applied evenly and fairly to all Tenders. The evaluation team may apply the evaluation criteria on a comparative basis, evaluating the Tenders by comparing one Proponent's Tender to another Proponent's Tender.

With respect to financial criteria, Tenders will be evaluated on the basis of which Tender will provide the best overall value to the City.

2.1.2 Clarifications and Additional Information

The evaluation team may, at its discretion, request clarifications or additional information from a Proponent with respect to any Tender, and the evaluation team may make such requests to only selected Proponents. The evaluation team may consider such clarifications or additional information in evaluating a Tender.

2.1.3 Appearance before Evaluation Team to Provide Clarifications

The evaluation team may, at its discretion, invite some or all of the Proponents to appear before the evaluation team to provide clarifications of their Tenders. In such event, the evaluation team will be entitled to consider the answers received in evaluating Tenders.

2.1.4 No Disclosure of Evaluations

No totals, weights, prices, scores or other evaluation information or data will be provided to any Proponent.

2.1.5 Representations of Proponents

By submitting a Tender, a Proponent is representing that it has the qualifications, experience, knowledge, skills and abilities necessary for the fulfillment of the Contract, and that all components, labour, materials and equipment required to undertake the Work or to provide the goods or services have been identified in the Tender or will be provided by the Proponent and are included in Tender price.

2.1.6 Completeness of Tender

Proponents will be deemed to have carefully examined this RFT, including all attached schedules and appendices and any addenda, prior to preparing and submitting a Tender with respect to any and all facts which may influence a Tender.

2.1.7 Lowest Tender Price Not Determinant

Without limiting its rights under this RFT and for greater certainty, the lowest Tender Price or any Tender will not necessarily be accepted. Because maintaining schedule for this project is critical, a Proponent's demonstrated capabilities in executing the Work may be of greater importance to the City than the Tender Price. The City reserves the right to reject any or all Tenders, or to accept any Tender, should it be deemed in the interest of the City to do so.

2.2 Notice to Proponent and Execution of Contract

Notice of selection by the City to the selected Proponent shall be in writing. Upon notification, the City and the Proponent will execute the Contract in the form set out in Section 1.3 of this RFT in accordance with the terms of this RFT.

2.3 Failure to Enter into Contract

If a selected Proponent fails to execute the Contract or satisfy any applicable conditions within ten (10) days of notice of selection, the City may, without incurring any liability and without limiting its other legal rights and remedies against the selected Proponent, withdraw the selection of that Proponent and proceed with the selection of another Proponent.

[End of Part 2]

PART 3 – TERMS AND CONDITIONS OF THE RFT PROCESS

3.1 General Information and Instructions

3.1.1 RFT Incorporated into Tender

All of the provisions of this RFT are deemed to be accepted by each Proponent and incorporated into each Proponent's Tender. A Proponent who submits conditions, options, variations or contingent statements to the terms as set out in this RFT, including the supplementary conditions of the Contract in Appendix A, either as part of its Tender or after receiving notice of selection, may be disqualified. If a Proponent is not disqualified despite such changes or qualifications, the provisions of this RFT, including the supplementary conditions of the Contract set out in Appendix A, will prevail over any such changes or qualifications in the Tender.

3.1.2 Proponents to Follow Instructions

Proponents should structure their Tenders in accordance with the instructions in this RFT. Where information is requested in this RFT, any response made in a Tender should reference the applicable section numbers of this RFT.

3.1.3 Tenders in English

All Tenders are to be in English only.

3.1.4 No Incorporation by Reference

The entire content of the Proponent's Tender should be submitted in a fixed form, and the content of websites or other external documents referred to in the Proponent's Tender but not attached will not be considered to form part of its Tender.

3.1.5 References and Past Performance

In the evaluation process, the City may include information provided by the Proponent's references and may also consider the Proponent's past performance or conduct on previous contracts with the City or other institutions.

3.1.6 Information in RFT Only an Estimate

The City and its advisers make no representation, warranty or guarantee as to the accuracy of the information contained in this RFT or issued by way of addenda. Any quantities shown or data contained in this RFT or provided by way of addenda are estimates only, and are for the sole purpose of indicating to Proponents the general scale and scope of the Work. It is the Proponent's responsibility to obtain all the information necessary to prepare a Tender in response to this RFT.

3.1.7 Proponents to Bear Their Own Costs

The Proponent will bear all costs associated with or incurred in the preparation and presentation of its Tender, including, if applicable, costs incurred for interviews or demonstrations.

3.1.8 Tender to be Retained by the City

The City will not return the Tender or any accompanying documentation submitted by a Proponent.

3.1.9 No Exclusivity of Contract

The Contract will not be an exclusive contract for the provision of the described Work. The City may contract with others for goods and services the same as or similar to the Work or may obtain such goods and services internally.

3.1.10 Sub-Contracting

Proponents may use sub-contractors for the Work, subject to the following:

- (a) Use of a sub-contractor (who should be clearly identified in the Tender) is acceptable. This may include a joint submission by two (2) Proponents that are not affiliated and have no formal corporate links; however, in such case, one of these Proponents should be prepared to take overall responsibility for successful performance of the Contract and this should be clearly defined in the Tender.
- (b) Sub-contracting to any firm or individual whose current or past corporate or other interests may, in the City's opinion, give rise to a conflict of interest in connection with this RFT will not be permitted. This includes, but is not limited to, any firm or individual involved in the preparation of this RFT.
- (c) Where applicable, the names of approved sub-contractors listed in the Tender will be included in the Contract. No additional sub-contractors will be added nor other changes made to this list in the Contract, without the written consent of the City.

3.1.11 Contract Subject to applicable Permits and Licences

Neither acceptance of a Tender nor execution of a Contract will constitute approval by the City of any activity or development contemplated in any Tender that requires any approval, permit or license pursuant to any federal, provincial, regional district or municipal statute, regulation or by-law.

3.2 Communication after Issuance of RFT

3.2.1 Proponents to Review RFT

Proponents shall promptly examine all of the RFT Documents and

- (a) shall report any errors, omissions or ambiguities; and
- (b) may direct questions or seek additional information

in writing by email to the RFT Contact on or before the Deadline for Questions. All questions or comments submitted by Proponents by email to the RFT Contact shall be deemed to be received once the email has entered into the RFT Contact's email inbox. No such communications are to be directed to anyone other than the RFT Contact, and the City shall not be responsible for any information provided by or obtained from any source other than the RFT Contact. The City is under no obligation to provide additional

information. It is the responsibility of the Proponent to seek clarification from the RFT Contact on any matter it considers to be unclear. The City shall not be responsible for any misunderstanding on the part of the Proponent concerning this RFT or its process.

3.2.2 All New Information to Proponents by Way of Addenda

This RFT may be amended only by addendum in accordance with this section. If the City, for any reason, determines that it is necessary to provide additional information relating to this RFT, such information will be communicated to all Proponents by addenda. Should the City issue an addendum, it will be posted only on the BC Bid website. Each addendum forms an integral part of this RFT and may contain important information, including significant changes to this RFT. Proponents are responsible for obtaining all addenda issued by the City. In the Submission Form (Appendix B), Proponents should confirm their receipt of all addenda by setting out the number of each addendum in the space provided.

3.2.3 Post-Deadline Addenda and Extension of Submission Deadline

If the City determines that it is necessary to issue an addendum after the Deadline for Issuing Addenda, the City may extend the Submission Deadline for a reasonable period of time.

3.2.4 Verify, Clarify and Supplement

When evaluating Tenders, the City may request further information from the Proponent or third parties in order to verify, clarify or supplement the information provided in the Proponent's Tender. The response received by the City shall, if accepted by the City, form an integral part of the Proponent's Tender.

3.3 Notification and Debriefing

3.3.1 Notification of Successful Proponent and Execution of Contract

- .1 The successful Proponent shall be notified by the City of its successful Tender and upon notification, will be required to execute the Contract and provide a Performance Bond and Labour and Materials Payment Bond within ten (10) days of notification in accordance with the requirements of this RFT and the Contract Documents.
- .2 The successful Proponent shall provide confirmation of insurance from an approved company stating that the Proponent is insured as required by the General and Supplementary Conditions.

3.3.2 Notification to Other Proponents

Once the Contract is executed by the City and a Proponent, the other Proponents shall be notified by public posting, in the same manner that this RFT was originally posted, of the outcome of the procurement process on the BC Bid website.

3.3.3 Debriefing

Proponents may request a debriefing after receipt of a notification of the outcome of the procurement process. All requests must be in writing to the RFT Contact and must be made within thirty (30) days of such notification.

3.3.4 Procurement Protest Procedure

If a Proponent wishes to challenge the RFT process, it should provide written notice to the RFT Contact in accordance with the City's procurement protest procedures and any applicable trade agreement or other applicable Tender protest procedures. The notice must provide a detailed explanation of the Proponent's concerns with the procurement process or its outcome.

3.4 Conflict of Interest and Prohibited Conduct

3.4.1 Conflict of Interest

For the purposes of this RFT, a conflict of interest ("**Conflict of Interest**") includes, but is not limited to, any situation or circumstance where:

- (a) in relation to the RFT process, the Proponent has an unfair advantage or engages in conduct, directly or indirectly, that may give it an unfair advantage, including but not limited to (I) having, or having access to, confidential information of the City in the preparation of its Tender that is not available to other Proponents, (ii) communicating with any person with a view to influencing preferred treatment in the RFT process (including but not limited to the lobbying of decision makers involved in the RFT process), or (iii) engaging in conduct that compromises, or could be seen to compromise, the integrity of the open and competitive RFT process or render that process non-competitive or unfair; or
- (b) in relation to the performance of its contractual obligations contemplated under a contract for the Work, the Proponent's other commitments, relationships or financial interests (i) could, or could be seen to, exercise an improper influence over the objective, unbiased and impartial exercise of its independent judgement, or (ii) could, or could be seen to, compromise, impair or be incompatible with the effective performance of its contractual obligations.

3.4.2 Disqualification for Conflict of Interest

The City may disqualify a Proponent for any conduct, situation or circumstances, determined by the City, in its sole and absolute discretion, to constitute a Conflict of Interest as defined above.

3.4.3 Disqualification for Prohibited Conduct

The City may disqualify a Proponent, rescind a notification of selection or terminate a contract subsequently entered into if the City determines that the Proponent has engaged in any conduct prohibited by this RFT.

3.4.4 Prohibited Proponent Communications

Proponents must not engage in any communications that could constitute a Conflict of Interest and should take note of the Conflict of Interest declaration set out in the Submission Form (Appendix B).

3.4.5 Proponent Not to Communicate with Media

Proponents must not at any time directly or indirectly communicate with the media in relation to this RFT or any Contract or other agreement entered into pursuant to this RFT without first obtaining the written permission of the RFT Contact.

3.4.6 No Lobbying

Proponents must not, in relation to this RFT or the evaluation and selection process, engage directly or indirectly in any form of political or other lobbying whatsoever to influence the selection of the successful Proponent(s).

3.4.7 Illegal or Unethical Conduct

Proponents must not engage in any illegal business practices, including activities such as bid-rigging, price-fixing, bribery, fraud, coercion or collusion. Proponents must not engage in any unethical conduct, including lobbying, as described above, or other inappropriate communications; offering gifts to any elected officials, employees, officers, agents, elected or appointed officials or other representatives of the City; deceitfulness; submitting Tenders containing misrepresentations or other misleading or inaccurate information; or any other conduct that compromises or may be seen to compromise the competitive process provided for in this RFT.

3.4.8 Past Performance or Past Conduct

The City may prohibit a supplier from participating in a procurement process based on past performance, previous or current legal proceedings against the City, or based on inappropriate conduct in a prior procurement process, including but not limited to the following:

- (a) illegal or unethical conduct as described above;
- (b) the refusal of the supplier to honour submitted pricing or other commitments; or
- (c) any conduct, situation or circumstance determined by the City, in its sole and absolute discretion, to have constituted a Conflict of Interest.

3.5 Confidential Information

3.5.1 Confidential Information of the City

All information provided by or obtained from the City in any form in connection with this RFT either before or after the issuance of this RFT:

- (a) is the sole property of the City and must be treated as confidential;
- (b) is not to be used for any purpose other than replying to this RFT and the performance of the Contract;
- (c) must not be disclosed without prior written authorization from the City; and
- (d) must be returned by the Proponent to the City immediately upon the request of the City.

3.5.2 Confidential Information of Proponent

A Proponent should identify any information in its Tender or any accompanying documentation supplied in confidence for which confidentiality is to be maintained by the City. The confidentiality of such information will be maintained by the City, except as otherwise required by law or by order of a court or

tribunal. Proponents are advised that their Tenders will, as necessary, be disclosed, on a confidential basis, to advisers retained by the City to advise or assist with the RFT process, including the evaluation of Tenders. If a Proponent has any questions about the collection and use of personal information pursuant to this RFT, questions are to be submitted to the RFT Contact.

3.6 Reserved Rights and Limitation of Liability

3.6.1 Reserved Rights of the City

The City reserves the right to:

- (a) make public the names of any or all Proponents;
- (b) make changes, including substantial changes, to this RFT provided that those changes are issued by way of addendum in the manner set out in this RFT;
- (c) request written clarification or the submission of supplementary written information in relation to the clarification request from any Proponent and incorporate a Proponent's response to that request for clarification into the Proponent's Tender;
- (d) assess a Proponent's Tender on the basis of: (i) a financial analysis determining the actual cost of the Tender when considering factors including quality, service, price and transition costs arising from the replacement of existing goods, services, practices, methodologies and infrastructure (howsoever originally established); and (ii) in addition to any other evaluation criteria or considerations set out in this RFT, consider any other relevant information that arises during this RFT process;
- (e) waive formalities and accept Tenders that substantially comply with the requirements of this RFT;
- (f) verify with any Proponent or with a third party any information set out in a Tender;
- (g) check references other than those provided by any Proponent;
- (h) disqualify a Proponent, rescind a notice of selection or terminate a contract subsequently entered into if the Proponent has engaged in any conduct that breaches the process rules or otherwise compromises or may be seen to compromise the competitive process;
- (i) select a Proponent that the City considers provides the best value to the City and other than the Proponent whose Tender reflects the lowest cost to the City;
- (j) cancel this RFT process at any stage in whole or in part at any time for any reason; or reject any or all Tenders;
- (k) issue another request for Tenders for the same or similar Work or on the same or different terms, sole source the Contract to anyone, or do nothing further, without liability to any Proponent or non-Proponent;
- (l) enter into discussion with one or more of the Proponents without such discussions in any way creating a binding contract between the City and any such Proponent;

- (m) negotiate changes to the scope of Work with any one or more Proponents without having any duty or obligation to advise any or all other Proponents;
- (n) change the date to accept a Tender; or
- (o) accept any Tender in whole or in part.

and these reserved rights are in addition to any other express rights or any other rights that may be implied in the circumstances.

3.6.2 Limitation of Liability

By submitting a Tender, each Proponent agrees that

- (a) neither the City nor any of its employees, officers, agents, elected or appointed officials, advisors or representatives will be liable, under any circumstances, for any claim arising out of this RFT process including but not limited to costs of preparation of the Tender, loss of profits, loss of opportunity or for any other claim; and
- (b) the Proponent waives any right to or claim for any compensation of any kind whatsoever, including claims for costs of preparation of the Tender, loss of profit or loss of opportunity by reason of the City's decision not to accept the Tender submitted by the Proponent, to enter into the Contract or another agreement with any other Proponent or to cancel this procurement process, and the Proponent shall be deemed to have agreed to waive such right or claim.

3.6.3 Contract subject to Financing, Council Approval and Applicable Enactments

Award of the Contract is subject to available financing by the City, the approval of the City's municipal council and the City's compliance with all applicable enactments.

3.7 Governing Law and Interpretation

These Terms and Conditions of the RFT Process in this Part 3:

- (a) are intended to be interpreted broadly and independently (with no particular provision intended to limit the scope of any other provision);
- (b) are non-exhaustive and shall not be construed as intending to limit the pre-existing rights of the City; and
- (c) are to be governed by and construed in accordance with the bylaws of the City, the laws of the province of British Columbia and the federal laws of Canada applicable therein.

[End of Part 3]

APPENDIX A –SUPPLEMENTARY CONDITIONS OF THE CONTRACT

SUPPLEMENTARY GENERAL CONDITIONS OF THE UNIT PRICE CONTRACT

CCDC4-2011

For this Contract, the Owner will use the Canadian Construction Documents Committee, Standard Construction Document CCDC4 Unit Price Contract – 2011 for the duration of this Contract with amendments as noted in the sections below.

These Supplementary Conditions presuppose the use of the CCDC4 Unit Price Contract – 2011. These “Supplementary Conditions” void, supersede or amend the applicable provisions of the standard form CCDC4 Unit Price Contract – 2011 “Agreement”, “Definitions” and “General Conditions”, as the case may be, as hereinafter provided.

ARTICLE A-3 CONTRACT DOCUMENTS

Add article A-3.2 to provide as follows:

“3.2 The *Contractor* acknowledges that it has reviewed and satisfied itself as to the *Contract Documents*, including without limitation, the plans, specifications and other materials referred to in this Article, and all other materials it desires, prior to execution of this *Contract*.”

ARTICLE A-5 PAYMENT

Revise the article A-5.3.1 to provide as follows:

“5.3.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:

- (1) 0% per annum above the prime rate for the first 60 days.
- (2) 0% per annum above the prime rate after the first 60 days.

Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by the Bank of Canada, for prime business loans as it may change from time to time.”

Retitle Article A-7 as follows:

ARTICLE A-7 ADDITIONAL PROVISIONS

Add the following articles 7.3 and 7.4 to Article A-7

“7.3 The *Contractor* acknowledges that the *Owner*, in the preparation of the *Contract Documents*, supply of oral or written information to *Tenderers*, review of *Tenders* or the carrying out of the *Owner’s* responsibilities under the *Contract* does not owe a duty of care to the *Contractor* and the *Contractor* waives for itself and its successors the right to sue the *Owner* in tort for any loss, including economic loss, damage, cost or expense arising from or connected with any error, omission or misrepresentation occurring in the preparation of the *Contract Documents*, supply of

- oral or written information to *Tenderers*, review of tenders or the carrying out of the *Owner's* responsibilities under the *Contract*.”
- “7.4 All time limits stated in this *Contract* are of the essence of the *Contract*.”

DEFINITIONS

The following definitions are amended:

1. Consultant

Add the following sentence:

“The words “Engineer”, “Owner’s Engineer”, “Contract Administrator” or “Consultant” wherever used in the *Contract Documents* shall be regarded as synonymous.”

2. Contractor

Add the following sentence:

“For the purpose of the *Contract*, the words “*Contractor*” and “*General Contractor*” shall be regarded as synonymous.”

3. Subcontractor

Delete and replace with the following:

“A *Subcontractor* is a person, firm or corporation, which has been approved by the *Owner*, undertaking the execution of a part of the *Work* by virtue of an agreement with the *Contractor*.”

The following definitions are added to the Agreement:

4. Builders Lien Act

Builders Lien Act means the *Builders Lien Act*, S.B.C. 1997, c45, as amended, and all regulations thereto, and any successor legislation in the Province of British Columbia in relation to builders liens.

5. Certificate of Completion

A *Certificate of Completion* is a certificate of completion as defined in the *Builders Lien Act*.

6. Engineer’s Representative

The *Engineer’s Representative* means any person authorized from time to time by the *Engineer* to perform the duties of the *Engineer* whose authority shall be notified in writing to the Contractor by the *Engineer*.

7. Final Acceptance

Final Acceptance means the *Work* has successfully passed all inspections and testing requirements at the end of the warrantee period.

8. RFT

RFT means the Request for Tenders entitled *Roper Reservoir Inlet Modifications & Everall PRV Chamber Installation Contract*, issued by the Owner for the Project.

GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

GC 1.1 CONTRACT DOCUMENTS

Add new paragraph 1.1.11 as follows:

“1.1.11 The table of contents and the headings of all the articles, paragraphs, parts and sections of any of the *Contract Documents* are provided for convenience of reference only and shall not affect the construction or interpretation of the *Contract Documents*.”

GC 2.4 DEFECTIVE WORK

Amend paragraph 2.4.1 by adding “, at the *Contractor’s* expense,” after “*Contract Documents*”.

GC 3.4 DOCUMENT REVIEW

Add new paragraph 3.4.2 as follows:

“3.4.2 Notwithstanding the foregoing, inconsistencies and omissions shall not include lack of reference on the *Drawings* or in the *Specifications* to labour and/or *Products* that are required or normally recognized within respective trade practices as being necessary for the complete execution of the *Work*.”

GC 4.2 CONTINGENCY ALLOWANCE

Delete paragraph 4.2 in its entirety.

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Delete paragraph 5.1 in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

Add paragraph 5.2.8 as follows:

“5.2.8 Before any payment is made by the *Owner* to the *Contractor*, the *Consultant* or the *Owner* may by written notice require that the *Contractor* furnish such further detailed information as the *Consultant* or the *Owner* may determine is necessary to establish compliance by the *Contractor* with the *Contract Documents*.”

GC 5.3 PROGRESS PAYMENT

Amend paragraph 5.3.1.2 to provide as follows:

“5.3.1.2 the *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 30 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* amends the application, the *Consultant* will promptly advise the *Contractor* in writing giving reasons for the amendment,”

Amend paragraph 5.3.1.3 to provide as follows:

“5.3.1.3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement - PAYMENT on or before 30 calendar days after the later of:
- receipt from the *Consultant* of the certificate of payment, or
- the last day of the monthly payment period for which the application for payment is made.”

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

5.4.1 Delete “if permitted by the lien legislation applicable to the *Place of the Work*” on the first two lines.

Add at the end of paragraph 5.4.1:

“The *Contractor* shall submit the following documents with its request for review by the *Consultant* to establish *Substantial Performance of the Work*. These requirements do not limit the *Contractor's* obligations for *Substantial Performance* noted elsewhere in the *Contract*. A deficiency holdback will be retained for two (2) times the estimated value of correcting or supplying the following items until they are all submitted, reviewed and accepted by the *Consultant*:

- .1 The list of all deficient and incomplete items of *Work* including the estimated value of each item;
- .2 Complete reports including certification by all testing, cleaning or inspection authorities or associations as specified in the *Contract Documents*;
- .3 A complete demonstration of all mechanical and electrical systems and electrically-operated devices to the *Owner's* operating and maintenance staff and any training required by the specifications, to the *Owner's* satisfaction;
- .4 All maintenance manuals, operating instructions, maintenance and operating tools, replacement parts or materials and warranties as specified in the *Contract Documents*;
- .5 A complete set of marked up construction *Drawings* and other data in the form specified in the *Contract Documents*, or as required by the *Consultant*, for the production of as built *Drawings* to show all significant changes to the *Work* made during construction;
- .6 Current certification by the *Workers' Compensation Board* that the *Contractor* and all *Subcontractors* are in good standing;
- .7 A statement that all claims and demands for extra work or otherwise, under or in connection with the *Contract*, have been presented to the *Consultant* and that the

- Contractor* expressly releases the *Owner* from all claims and demands except those made in writing prior to that date and still unsettled;
- .8 A statutory declaration in accordance with paragraph 5.2.8 of these Supplementary Conditions of the *Contract*; and
- .9 All keys required for the entire *Project*.

The requirement to provide documents and other items listed in sub-paragraphs .1 through .9 does not limit the *Contractor's* obligations for *Substantial Performance of the Work* noted elsewhere in the *Contract*. A deficiency holdback will be retained for documents and other items not submitted and an estimated value is to be submitted for review and acceptance by the *Consultant*.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

Add the following as GC 5.5.6 and 5.6.7:

- “5.5.6 At the time of *Substantial Performance of the Work*, the *Owner* may retain a deficiency holdback established by the *Consultant* based upon Two (2) times the estimated value of the outstanding items to be completed or corrected. The amount will be released by the *Owner* in one lump sum only upon correction of all deficiencies.
- 5.6.7 In addition to the deficiency holdback, the *Owner* may retain additional holdbacks as specified in the *Contract Documents* to be retained until receipt of items specified, such as close-out documentation, as-built documentation and *Owner's* manuals.”

GC 6.2 CHANGE ORDER

Add paragraph 6.2.4 to provide as follows:

- “6.2.4 The allowance for overhead and profit charged by the *Contractor* and *Subcontractors* shall be as follows:
- .1 Cost of materials and labour plus 10% mark-up by the *Contractor* for changes in the *Work* performed by the *Contractor*;
- .2 Cost of labour and materials plus 10% mark-up by the *Contractor* on changes in the *Work* performed by the *Subcontractors*;
- .3 Cost of labour and materials plus 10% mark-up by the *Subcontractors* for changes in the *Work* performed by the *Subcontractors*; and
- .4 The overhead and profit for changes in the *Work* shall include supervision, administrative costs, small tools, miscellaneous materials, layout, additional bonding costs, and recording of the changes on the record drawings.”

GC 6.5 DELAYS

Add the following new paragraphs:

- “6.5.6 If the *Contractor's* operations expose any items which may indicate an archaeological find, such as building remains, hardware, accumulations of bones, pottery, or arrowheads:

- .1 The *Contractor* shall immediately notify the *Consultant* and suspend operations within the area identified by the *Consultant*. *Work* shall remain suspended within that area until otherwise directed by the *Consultant* in writing.
- .2 Any delay in the completion date of the *Contract* that is caused by such a cessation of construction operations will be considered to be beyond the *Contractor's* control in accordance with paragraph GC 6.5.3, but will not be considered to be a delay resulting from an action of the *Owner* or the *Consultant* or anyone employed or engaged by them directly or indirectly.
- .3 Any work directed or authorised by the *Consultant* with an archaeological find will be considered a change in *Work* authorized by a *Change Directive*, and GC 6.3 shall apply.”

GC 9.1 PROTECTION OF WORK AND PROPERTY

Add the following new paragraphs:

- “9.1.5 The *Contractor* shall be responsible generally for the care, maintenance and protection of the *Work* during construction and during any shut-down or suspension of the *Work*.
- 9.1.6 The *Contractor* shall ensure that all rights and privileges presently accorded to all properties adjacent to the *Place of the Work* are maintained.
- 9.1.7 When carrying out excavation work, the *Contractor* may encounter underground utilities such as, without limitation, sewers, gas mains, telephone cables, power cables, and water mains. The *Contractor* shall be fully responsible for any breakage or damage to such utilities, and the *Contractor* shall pay the full cost of repairing such damages and making good any losses or damages which are caused as a result of his or her operation in carrying out this *Contract*.
- 9.1.8 It shall be the *Contractor's* responsibility to obtain written permission and to make any required arrangements with the owners of any adjacent properties on which the *Contractor* may encroach.
- 9.1.9 The *Contractor* shall furnish and bear the cost of any watchman the *Contractor* may require for protection to perform this *Contract*.”

GC 9.4 CONSTRUCTION SAFETY

Add the following new paragraph:

- “9.4.2 The *Contractor* shall be responsible for and ensure the safety not only of the workers, *Subcontractors*, tradesmen and suppliers and their plant and equipment but also of all other persons who enter the *Place of the Work* whether during working hours or not and for that purpose shall erect such fencing, boardings and signs and shall employ such safety measures as may be necessary to ensure the safety of such persons.”

GC 11.1 INSURANCE

Amend paragraph 11.1.1 as follows:

Delete the words “the minimum requirements of which are specified in CCDC 41 – CCDC Insurance Requirements in effect at the time of bid closing except as hereinafter provided” in lines 2 and 3.

Delete paragraph 11.1.1.1 and replace with the following:

“.1 Commercial general liability insurance in the form of a wrap-up liability insurance in the amount of not less than five million dollars (\$5,000,000) per occurrence. The *Owner*, the *Consultant*, sub-consultants and special consultants as identified by the *Owner* and all *Subcontractors* involved in the performance of the *Work* shall be additional insureds under the commercial general liability insurance policy which shall contain a cross liability clause whereby one insured can make a claim, or bring an action, against another insured. The commercial general liability insurance shall remain in force from the commencement of the performance of the *Work* under the *Contract*, and shall include completed operations coverage effective for a period of two (2) years following issuance of the *Certificate of Completion*.”

Delete paragraph 11.1.1.2 and replace with the following:

“.2 Vehicle liability insurance in the amount of not less than \$5,000,000 per occurrence from the date of commencement of the *Work* until one year after the date of issue of the *Certificate of Completion*.”

Delete paragraph 11.1.1.3 in its entirety.

Delete the first sentence in paragraph 11.1.1.4 and replace with the following:

“.4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant* and sub-consultants and special consultants as identified by the *Owner*.”

Delete paragraph 11.1.1.5 in its entirety.

Add the following to paragraph 11.1.1:

“.8 Course of construction or builder's risk insurance in the amount of 100% of the *Contract Price*.”

“.9 Professional liability insurance in the amount of not less than \$2,000,000 for any professionals that the *Contractor* may engage in performing the *Work* in this *Contract*.”

Delete paragraphs 11.1.6 to 11.1.8 in their entirety and replace with the following new paragraphs:

“11.1.6 All insurance policies shall have the right of subrogation waived as against the *Owner*, the *Consultant*, their employees and agents.

11.1.7 All insurance policies shall contain provisions to the effect that thirty (30) days prior notice of cancellation will be given in writing to each insured, including the *Owner*. In the event that

some or all of the insurance policies required under this *Contract* are cancelled, the *Contractor* shall promptly obtain insurance with other insurers so as to comply with the provisions of this *Contract*.

11.1.8 The *Contractor* shall ensure that its *Subcontractors* comply with all applicable insurance requirements.

11.1.9 Where the *Work* involves blasting and other activities, any exclusions of such aspects of the *Work* shall be deleted from the insurance policies.”

GC 11.2 CONTRACT SECURITY

Delete paragraph 11.2.1 in its entirety and replace with the following:

“11.2.1 The *Contractor* shall, within 10 calendar days, upon notification from the *Owner* of its successful Tender, provide to the *Owner* a performance bond and a labour and material payment bond, each in the amount of 50% of the *Contract Price* covering the performance of the *Work*.”

Delete paragraph 11.2.2 in its entirety and replace with the following:

“11.2.2 All bonds shall be issued by a duly licensed surety company authorized to transact a business of suretyship in British Columbia and in a form acceptable to the *Owner*, and shall be maintained in good standing until the fulfillment of the *Contract* including all warranty obligations pursuant to GC12.3 WARRANTY.

GC 12.3 WARRANTY

Amend paragraph 12.3.1 to provide as follows:

“12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one (1) year from the date of *Substantial Performance of the Work*.”

Amend paragraphs 12.3.3, 12.3.4 and 12.3.6 to provide as follows:

“12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one-year warranty period.

12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor's* expense, defects or deficiencies in the *Work* which appear prior to and during the one-year warranty period.

12.3.6 Any extended warranties required beyond the one-year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor's* responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.”

END OF SECTION

APPENDIX B – SUBMISSION FORM

1. Proponent Information

Please fill out the following form, naming one person to be the Proponent's contact for the RFT process and for any clarifications or communication that might be necessary.	
Full Legal Name of Proponent:	
Any Other Relevant Name under which Proponent Carries on Business:	
Street Address:	
City, Province/State:	
Postal Code:	
Phone Number:	
Fax Number:	
Company Website (if any):	
Proponent Contact Name and Title:	
Proponent Contact Phone:	
Proponent Contact Fax:	
Proponent Contact Email:	

- ☐ I acknowledge that the above company does have a valid City of White Rock Business License or British Columbia Professional License/Permit to Practice.
- ☐ I acknowledge that the above company does not have a City of White Rock Business License and understands the procedure in obtaining a valid license that must accompany the signed award letter.

The awarded vendor must provide a copy of their City of White Rock Business License with the signed award letter.

All related information on obtaining a Business License can be found here:

www.whiterockcity.ca/333/Business-Licences

2. Offer

The Proponent has carefully examined the RFT Documents and has a clear and comprehensive knowledge of the Work required under the RFT. By submitting a Tender, the Proponent agrees and consents to the terms, conditions and provisions of the RFT, including the Form of Contract, and offers to provide the Work in accordance therewith at the rates set out in its Tender.

3. Schedules

This Submission Form includes the following schedules completed by the Proponent which are attached to and form part of this Submission Form:

Schedule A: Proponent's Experience, Reputation and Qualifications

Schedule B: Proponent's Work Plan and Methodology

Schedule C: Proponent's Work Schedule

Schedule D: Proponent's Pricing for Work

Schedule E: Proponent's Pricing for Additions and Deletions

The Proponent confirms that it has factored all of the provisions of this RFT, including insurance and indemnity requirements, into its pricing assumptions and calculations.

4. Addenda

The Proponent is deemed to have read and accepted all addenda issued by the City prior to the Deadline for Issuing Addenda. The onus is on Proponents to make any necessary amendments to their Tenders based on the addenda. The Proponent is requested to confirm that it has received all addenda by listing the addenda numbers, or if no addenda were issued by writing the word "None", on the following line: _____ . Proponents who fail to complete this section will be deemed to have received all posted addenda.

5. No Prohibited Conduct

The Proponent declares that it has not engaged in any conduct prohibited by this RFT.

6. Conflict of Interest

Proponents must declare all potential Conflicts of Interest, as defined in section 3.4.1 of the RFT. This includes disclosing the names and all pertinent details of all individuals (employees, advisers, or individuals acting in any other capacity) who (a) participated in the preparation of the Tender; **AND** (b) were elected officials or employees of the City within twelve (12) months prior to the Submission Deadline.

If the box below is left blank, the Proponent will be deemed to declare that (a) there was no Conflict of Interest in preparing its Tender; and (b) there is no foreseeable Conflict of Interest in performing the contractual obligations contemplated in the RFT.

Otherwise, if the statement below applies, check the box.

- ☐ The Proponent declares that (a) there was no Conflict of Interest in preparing its Tender; and (b) there is no foreseeable Conflict of Interest in performing the contractual obligations contemplated in this RFT.
- ☐ The Proponent declares that there is an actual or potential Conflict of Interest relating to the preparation of its Tender, and/or the Proponent foresees an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFT.

If the Proponent declares an actual or potential Conflict of Interest by marking the box above, the Proponent must set out below details of the actual or potential Conflict of Interest:

7. Disclosure of Information

The Proponent hereby agrees that any information provided in this Tender, even if it is identified as being supplied in confidence, may be disclosed where required by law or by order of a court or tribunal. The Proponent hereby consents to the disclosure, on a confidential basis, of this Tender by the City to the advisers retained by the City to advise or assist with the RFT process, including with respect to the evaluation this Tender.

The following individuals, as employees, advisers, or in any other capacity (a) participated in the preparation of our Tender; **AND** (b) were elected officials or employees of the City and have ceased that employment within twelve (12) months prior to the Submission Deadline:

Name of Individual:
Job Classification:
Department:
Last Date of Employment with the City:
Name of Last Supervisor:
Brief Description of Individual's Job Functions:
Brief Description of Nature of Individual's Participation in the Preparation of the Tender:

(Repeat above for each identified individual)

The Proponent agrees that, upon request, the Proponent shall provide the City with additional information about each individual identified above in the form prescribed by the City.

8. Tender Irrevocable

The Proponent agrees that its tender shall be irrevocable for a period of 90 days following the Submission Deadline.

9. Execution of Contract

The Proponent agrees that in the event its Tender is selected by the City, in whole or in part, the Proponent will finalize and execute the Contract in the form set out in Section 1.3 of this RFT and in accordance with the terms of this RFT.

Signature of Witness

Signature of Proponent Representative

Name of Witness

Name of Proponent Representative

Title of Proponent Representative

Date

I have the authority to bind the Proponent.

Schedule A: Proponent's Experience, Reputation and Qualifications

Proponents should provide the following information in the space provided and/or by attaching additional pages, if necessary:

A) Proponent Profile

Proponent profile, including full legal name, form of business organization (e.g. corporation, sole proprietorship, etc.), length of time in business, number of employees, and a brief description of Proponent's current business:

B) Qualifications and Experience

Details of Proponent's ability and expertise that will allow Proponent to satisfactorily provide the Work, including a description of relevant past experience with similar contracts (including references, contract value, and date of performance). Proponent should detail at least three (3) projects it has completed in the past three (3) years that it considers is substantially similar to the Work required under this RFT:

C) Key Personnel

Key personnel of the Proponent who will be responsible for the Work, together with a description of their respective responsibilities and related experience:

1) Name: _____

Responsibilities:

Experience:

2) Name:

Responsibilities:

Experience:

3) Name: _____

Responsibilities:

Experience:

4) Name: _____

Responsibilities:

Experience:

5) Name: _____

Responsibilities:

Experience:

6) Name: _____

Responsibilities:

Experience:

D) Subcontractors (if any)

Subcontractors that the Proponent intends to use for performance of the Work, including a description of the portion of the Work proposed to be subcontracted and the subcontractor's relevant experience:

1) Subcontractor Name:

Responsibilities:

Experience:

2) Subcontractor Name:

Responsibilities:

Experience:

3) Subcontractor Name:

Responsibilities:

Experience:

4) Subcontractor Name:

Responsibilities:

Experience:

5) Subcontractor Name:

Responsibilities:

Experience:

6) Subcontractor Name:

Responsibilities:

Experience:

E) References

Details of Proponent's references:

1) Reference Name:

Reference address, phone number and email address:

Reference's employer and position within employer:

Reference's relationship to Proponent and basis for reference:

Experience:

2) Reference Name:

Reference address, phone number and email address:

Reference's employer and position within employer:

Reference's relationship to Proponent and basis for reference:

3) Reference Name:

Reference address, phone number and email address:

Reference's employer and position within employer:

Reference's relationship to Proponent and basis for reference:

Schedule B: Work Plan and Methodology

Proponents should provide the following information in the space provided and/or by attaching additional pages, if necessary:

- A) A brief narrative that illustrates the Proponent's understanding of the City's requirements for the performance of the Work:

- B) A description of the general approach and methodology the Proponent would take in performing and managing the Work:

- C) Any suggested amendments to the Work as described in the RFT that the Proponent suggests would be of benefit to the City in terms of value for money, cost savings, environmental benefits, technological benefits, or other benefits:

D) Proponent's plans to minimize neighbourhood and community disruptions and nuisances in carrying out Work:

E) Proponent's plan to ensure compliance with all applicable environmental laws and regulations:

F) Proponent's plans to manage works affecting North Bluff Road:

Schedule C: Work Schedule

Proponents should provide the following information in the space provided and/or by attaching additional pages, if necessary:

<u>Work Description</u>	<u>Target Date</u>
Start Date	
Completion Date	

Schedule D: Pricing for Work

Proponents should provide their estimated pricing for the Work in the table below. If a Proponent wishes to provide an alternative pricing structure for the Work, the Proponent may describe the alternative structure, including how it would benefit the City, in an attached page.

- (a) Proponents should provide the information requested below.
- (b) Rates must be provided in Canadian funds, inclusive of all applicable duties and taxes except for Goods and Services Tax (“GST”), which should be itemized separately.
- (c) Rates quoted by the Proponent must be all-inclusive and must include all labour and material costs, all freight and carriage costs, all insurance costs, all costs of delivery to the City, all costs of installation and set-up, including any pre-delivery inspection charges, and all other overhead, including any fees or other charges required by law.
- (d) MMCD sections referenced are for information purposes only. For some line items, more than one MMCD specification section may apply. All installations to be completed in accordance with all applicable MMCD sections and in accordance with the Contract Drawings. Where the MMCD and contract drawings are in conflict, the Contract Drawings shall take precedence.

PROJECT SITE 1: ROPER RESERVOIR INLET MODIFICATIONS						
ITEM NO.	MMCD SECTION	SPECIFICATION TITLE	UNIT	EST. QTY	UNIT PRICE	AMOUNT
DIVISION 31 - EARTHWORK						
	31 24 13	Earthworks, Trees, Landscaping				
1	1.8	Landscaping To previous standard	Lump Sum	1		
DIVISION 31 - EARTHWORKS: Sub-Total						
DIVISION 33 - UTILITIES						
	33 11 01	Waterworks				
2	1.8.2	Watermain PVC 150 mm diameter DR18 depth of main 1.0 m Native Backfill	Lineal Meters	5		
3	1.8.2	Watermain 316 SS 150 mm diameter SCH40 Reservoir Inlet Line	Lineal Meters	32		
4	1.8.2	Watermain 316 SS 100 mm diameter 316 SS SCH40 Internal Reservoir Inlet Pipes	Lineal Meters	11		
5	1.8.2	Reservoir Roof Penetration Coring and grouting inlet line penetration through reservoir roof	Each	2		
6	1.8.2	Joint Restraints 150 mm PVC as specified	Each	12		
7	1.8.2	Couplings 150 mm	Each	1		
8	1.8.2	Pipe Clamp Supports For 316SS 150 mm and 100 mm external and internal Reservoir Pipes	Each	27		
9	1.8.2	Pipe Supports per Detail D, Drawing C-04 Internal for 100 dia. 316 SS Pipe	Each	2		
10	1.8.3	In-line Gate Valves 150 mm	Each	1		
11	1.8.3	In-line Gate Valves 200 mm	Each	1		
12	1.8.3	Tee 200 mm X 200 mm X 150 mm PVC Flanged, incl. cut and install in existing main	Each	1		
13	1.8.3	Tee 150 mm X 100 mm X 100 mm 316SS	Each	1		
14	1.8.3	45 deg Bend 150 mm diameter 316 SS	Each	2		
15	1.8.3	90 deg Bend 150 mm diameter 316 SS	Each	2		
16	1.8.3	90 deg Bend 100 mm diameter 316 SS	Each	4		
17	1.8.3	45 deg Bend 100 mm diameter 316 SS	Each	4		

PROJECT SITE 1: ROPER RESERVOIR INLET MODIFICATIONS						
ITEM NO.	MMCD SECTION	SPECIFICATION TITLE	UNIT	EST. QTY	UNIT PRICE	AMOUNT
18	1.8.3	Inlet Nozzle Duckbill Style NSF61 Certified	Each	2		
19	1.8.3	New Pressure Reducing Valve New PRV in control building, including supply, not including install	LS	1		
20	1.8.4	Reducer 150x100 316 SS	Each	2		
DIVISION 33 – Waterworks: Sub-Total						
ADDITIONAL ITEMS						
	Reference	Description				Amount
21	Contract Drawings	Piping Retrofits - PRV Building Labor and Materials for modifications within PRV building, excluding cost of the new valve		Lump Sum		
22	Contract Drawings	Electrical Installation Electrical Installation, including control panels, wiring, heat trace, etc.		Lump Sum		
23	Contract Drawings	Provisional Item SCADA Integration & Programming, undertaken by third party Contractor		Allowance		
ADDITIONAL ITEMS: Sub-Total						
Sub-Total: Site 1 Construction Cost (excluding GST)						

PROJECT SITE 2: EVERALL PRV CHAMBER INSTALLATION						
ITEM NO.	MMCD SECTION	SPECIFICATION TITLE	UNIT	EST. QTY	UNIT PRICE	AMOUNT
DIVISION 01 - GENERAL REQUIREMENTS						
	01 55 00	Traffic Control, Vehicle Access and Parking				
24	1.5.1	Traffic Control, Vehicle Access and Parking Everall Street	Lump Sum	1		
DIVISION 01 - GENERAL REQUIREMENTS: Sub-Total						
DIVISION 31 - EARTHWORK						
	31 24 13	Earthworks, Trees, Landscaping				
25	1.8	Landscaping To previous standard	Lump Sum	1		
DIVISION 31 - EARTHWORKS: Sub-Total						

PROJECT SITE 2: EVERALL PRV CHAMBER INSTALLATION						
ITEM NO.	MMCD SECTION	SPECIFICATION TITLE	UNIT	EST. QTY	UNIT PRICE	AMOUNT
DIVISION 32 - ROADS AND SITE IMPROVEMENTS						
	32 01 16.7	Cold Milling				
26	1.5	Surface Milling Average 40mm thick, dispose offsite	Square Meter	102		
	32 12 13.1	Asphalt Tack Coat				
27	1.5	Asphalt Tack Coat Emulsified Asphalt	Square Meter	102		
	32 12 16	Hot-Mix Asphalt Concrete Paving				
28	1.5	Asphalt Pavement Upper Coarse #1	Tonne	25		
DIVISION 32 – ROAD AND SITE IMPROVEMENTS: Sub-Total						
DIVISION 33 - UTILITIES						
	33 11 01	Waterworks				
29	1.8.2	Watermain PVC 200 mm diameter depth of main 1.0 m Native Backfill	Lineal Meters	45		
30	1.8.2	Joint Restraints 200 mm PVC as specified	Each	15		
31	1.8.2	Couplings 200 mm	Each	6		
32	1.8.3	In-line Gate Valves 200 mm	Each	2		
33	1.8.3	Tee 200 mm X 200 mm X 200 mm PVC Flanged, incl. cut and install in existing main	Each	2		
34	1.8.3	90 deg Bend 200 mm diameter PVC	Each	3		
35	1.8.4	Reducer 200 mm X 150 mm diameter PVC	Each	2		
36	1.8.5	Blow-Off Assembly Standard Drawing W8	Each	2		
37	1.8.6	Cap 50 mm diameter DI	Each	1		
38	1.8.13	Watermain Tie-in 16 Avenue (North Bluff Road)	Lump Sum	1		
39	1.8.13	Watermain Tie-in Everall Street	Lump Sum	1		
40	1.8	Pre-Cast PRV Chamber Supply and installation of concrete PRV chamber including all associated piping, valves, hatches, and appurtenances. Include all works necessary to install the PRV chamber in accordance with MMCD and the Contract Drawings.	Lump Sum	1		
DIVISION 33 – Waterworks: Sub-Total						

PROJECT SITE 2: EVERALL PRV CHAMBER INSTALLATION						
ITEM NO.	MMCD SECTION	SPECIFICATION TITLE	UNIT	EST. QTY	UNIT PRICE	AMOUNT
ADDITIONAL ITEMS						
Reference		Description			Amount	
41	Contract Drawings	PRV Electrical Kiosk supply and installation, including all labour, materials and all appurtenances necessary for a complete installation in accordance with the contract		Lump Sum		
42	Contract Drawings	PRV Valve Chamber Electrical supply and installation, including all labour, materials and all appurtenances necessary for a complete installation in accordance with the contract.		Lump Sum		
43	Contract Drawings	PRV Electrical Kiosk Bollards supply and installation		Lump Sum		
44	Contract Drawings	Electrical Kiosk Instrumentation		Lump Sum		
45	Contract Drawings	SCADA Integration & Programming, undertaken by third party Contractor		Lump Sum		
ADDITIONAL ITEMS: Sub-Total						
Sub-Total: Site 1 Construction Cost (excluding GST)						

INSURANCE AND BONDING			
Bonding and Insurance Requirements	Bonding Requirements as per Section 1.5.8 and Insurance per CCDC4 GC11 and associated supplementary conditions for both Project Sites	Lump Sum	
INSURANCE AND BONDING (BOTH SITES): Sub-Total			
Total Construction Cost Summary (Both Project Sites)			
Sub-Total: Construction Cost for both Project Sites (excluding GST)			
GST (5%)			
PROJECT SITE 1 & 2 TOTAL COST			

SCHEDULE E: Unit Prices for Additions and Deletions

The following Unit Prices shall be used to determine the value of authorized changes in the Work in accordance with the General and Supplementary Conditions. The Unit Prices listed for additions apply to performing additional work during the time scheduled for performance of similar work already included in the Bid Price and will increase the Contract Price. Unit Prices for deletions will decrease the Contract Price. Unit Prices do NOT include GST.

Item	Description	Unit Price	Unit Price (\$)	
			Addition	Deletion
		Sub Total		

APPENDIX C – WORK SPECIFICATIONS

City of White Rock Roper Reservoir Inlet

CONTRACT No. WR19-009

ISSUED FOR TENDER



LOCATION PLAN
N.T.S.

DRAWING INDEX	
SHEET #	TITLE
C-01	CIVIL SPECIFICATIONS
C-02	CIVIL SITE PLAN
C-03	CIVIL CONSTRUCTION INLET PIPE DETAIL
C-04	CIVIL CONSTRUCTION DETAILS
P-01	PROCESS FLOW AND INSTRUMENTATION DIAGRAM
M-01	EXISTING CONTROL BUILDING MECHANICAL CHANGES, DETAILS AND SPECIFICATIONS
M-02	CONTROL BUILDING MECHANICAL LAYOUT
E-00	ELECTRICAL GENERAL NOTES
E-01	ELECTRICAL SITE PLAN
E-02	CONTROL BUILDING ELECTRICAL EQUIPMENT LAYOUT
E-10	WIRING DIAGRAM
E-11	MAIN RTU MODULE WIRING
E-20	ELECTRICAL HEAT TRACING
E-21	ELECTRICAL HEAT TRACING STANDARD INSTALLATION DETAILS



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PROJECT No. 11181229-01 (004)
July 2019

CIVIL SPECIFICATIONS

GENERAL

- ALL REFERENCES TO MASTER MUNICIPAL CONSTRUCTION DOCUMENTS ASSOCIATION (MMCD) MASTER MUNICIPAL SPECIFICATIONS ARE REFERRING TO PLATINUM ADDITION PRINTED 2009.
- PROJECT IDENTIFICATION AND PUBLIC NOTIFICATION OF CONSTRUCTION ACTIVITIES AND SCHEDULE IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 01 58 01.
- SITE SECURITY IS THE RESPONSIBILITY OF THE CONTRACTOR.
- DUST CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 31 15 60.
- SHRUB AND TREE PRESERVATION IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN SECTION 31 11 41.
- ENVIRONMENTAL PROTECTION OF THE WORK SITE IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL FOLLOW ALL REASONABLE STEPS TO MITIGATE HARM TO THE ENVIRONMENT AS OUTLINED IN MMCD SECTION 01 57 01.
- TEMPORARY ACCESS ROADS, PARKING AREAS AND TRAFFIC CONTROL MEASURES ARE THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 01 55 00.

WATERWORKS

- ALL WATERWORKS TO CONFORM TO MMCD, MASTER MUNICIPAL SPECIFICATIONS, WATERWORKS SECTION 33 11 01, UNLESS OTHERWISE NOTED.
- WATERMAIN SIZES 100 mm THROUGH 300 mm SHALL CONFORM TO AWWA C900 AND SHALL HAVE A DIMENSION RATIO (DR) OF 18, UNLESS OTHERWISE NOTED.
- PVC WATERMAIN MATERIAL USED TO CONVEY POTABLE WATER MUST BE BLUE IN COLOR.
- ALL MATERIAL MUST BE NEW.
- GASKET MATERIAL AND JOINT LUBRICANTS MUST BE CERTIFIED FOR POTABLE WATER USE.
- FLANGED FITTINGS AND CONNECTIONS ARE ONLY TO BE USED ON THE BRANCH SIDE OF THE PIPES AT TEES WYES, ELBOWS, ETC.
- ALL FLANGED JOINTS TO CONFORM TO MMCD SPECIFICATION SECTION 33 11 01.
- ONLY FLANGES OF THE SAME TYPE TO BE MATED.
- REQUIRED TESTING FROM CONTRACTORS TO BE BY 3RD PARTY TESTING COMPANY OR OBSERVED BY CITY WATER STAFF PRIOR TO THE CITY ACCEPTING AND TIE-IN TO THE EXISTING WATER UTILITY DISTRIBUTION SYSTEM.
 - PRESSURE TEST TO MMCD 33 11 01 PAGE 20, 3.19.3, OR AWWA M23 & C605 STANDARD AND OBSERVED BY CITY WATER OPERATOR OR THIRD PARTY CONTRACTOR.
 - DISINFECTION TO AWWA STANDARDS. UNITS TO BE IN PPM WITH RESIDUALS AFTER 24 HOURS.
 - FRASER HEALTH CONSTRUCTION PERMIT FOR NEW WATERMAIN CONSTRUCTION.
 - MICRO BIOLOGICAL TEST TO AWWA STANDARD, 2 TESTS 24 HOURS APART (TOTAL CHLOROFORM & ECOLI COUNT)
 - PROVIDE MICRO BIOLOGICAL TEST FOR EACH TIE-IN POINT AND ENDS OF THE INSTALLED WATERMAIN.
 - PROVIDE MICRO BIOLOGICAL TEST FOR EACH SERVICE CONNECTION.
 - THE CONTRACTOR IS TO CONTACT SIMON PITHER, LEAD WATER OPERATOR, AT 604-880-4220, TO CONFIRM THEIR TIE-IN PROCEDURE AND WORKS AT THE START OF THE PROJECT.
- DIRECT BURY GATE VALVES SHALL BE USED FOR PIPES 100 mm TO 1200 mm DIAMETER IN SIZE.
- GATE VALVES SHALL CONFORM TO AWWA C500, C509, OR C515; NO RISING STEM.
- ALL EXTERNAL NUTS AND BOLTS TO BE TYPE 304 STAINLESS STEEL OR BETTER.
- PROVIDE CATHODIC PROTECTION FOR STEEL, CAST AND DUCTILE IRON PIPE, CAST IRON FITTINGS, VALVES, HYDRANTS, COPPER SERVICES AND WHEREVER ELSE SHOWN ON THE DRAWINGS.
- CATHODIC PROTECTION SHALL BE IN ACCORDANCE WITH THE LOCAL MUNICIPAL GUIDELINES OR AS SPECIFIED BY THE ENGINEER.
- COUPLINGS AND FLANGED COUPLING ADAPTERS ARE TO CONFORM TO MMCD SPECIFICATIONS, SECTION 33 11 01, ITEM 2.2.12.
- VALVES ARE TO CONFORM TO MMCD SPECIFICATIONS, SECTION 33 11 01, ITEM 2.3.
- WATERMAINS TO BE RESTRAINED INSTEAD OF USING CONCRETE THRUST BLOCKS. THIS IS DUE TO LIMITED SPACE REQUIREMENTS FOR ALL UNDERGROUND UTILITIES IN ROADWAY. HORIZONTAL AND VERTICAL DEFLECTIONS TO USE EBAA WEDGE ACTION RESTRAINTS.

EXECUTION

- GENERAL EXECUTION OF WATERMAINS, VALVES, CONNECTIONS, FITTINGS AND COUPLINGS AND THEIR APPURTENANCES INCLUDE MATERIAL PREPARATION, TRENCHING, BACKFILL AND BEDDING MATERIAL, PIPE INSTALLATION, JOINT RESTRAINTS AND CORROSION PROTECTION.
- CLEAN PIPES, FITTINGS, VALVES, HYDRANTS, AND APPURTENANCES OF DEBRIS AND WATER BEFORE INSTALLATION. CAREFULLY INSPECT MATERIALS FOR DEFECTS BEFORE INSTALLING. REMOVE DEFECTIVE MATERIALS FROM SITE.
- DO TRENCHING TO CONFORM TO THE MMCD SPECIFICATIONS, 3.3-EXCAVATION, SECTION 31 23 01 - EXCAVATING, TRENCHING AND BACKFILLING.
- TRENCH ALIGNMENT AND DEPTH AS SHOWN ON THE CONTRACT DRAWINGS.
- TRENCH DEPTH TO PROVIDE COVER OVER PIPE OF NOT LESS THAN 1.0 m FROM FINISHED GRADE UNLESS SHOWN OTHERWISE IN THE CONTRACT DRAWINGS.

GRANULAR BEDDING

- FOR GRANULAR BEDDING, FILL OVER-EXCAVATION BELOW DESIGN ELEVATION OF BOTTOM OF SPECIFIED BEDDING WITH GRANULAR BEDDING PLACED AND COMPACTED IN ACCORDANCE WITH 3.5.2 AND 3.5.5 OF MMCD SPECIFICATIONS, SECTION 33 11 01. DRAIN ROCK MAY BE USED FOR BACKFILL OF OVER-EXCAVATION WITH CONTRACT ADMINISTRATOR'S APPROVAL.
- PLACE GRANULAR BEDDING MATERIAL ACROSS FULL WIDTH OF TRENCH BOTTOM IN UNIFORM LAYERS. WHERE PIPE BEDDING MATERIALS REQUIRE COMPACTION TO MEET DENSITY REQUIREMENTS, IT SHALL BE ACHIEVED BY MEANS OF HAND COMPACTION IN 150mm LIFTS TO THE DEPTHS SHOWN ON THE UTILITY TRENCH DETAIL, WITH FINAL DENSITIES CONFIRMED BY GEOTECHNICAL TESTING AND DOCUMENTATION.
- SHAPE BED TRUE TO GRADE TO PROVIDE CONTINUOUS UNIFORM BEARING SURFACE FOR PIPE. DO NOT USE BLOCKS WHEN BEDDING PIPE.
- SHAPE TRANSVERSE DEPRESSIONS IN BEDDING AS REQUIRED TO SUIT JOINTS.
- COMPACT EACH LAYER FULL WIDTH OF BED TO MINIMUM 95% MODIFIED PROCTOR DENSITY IN COMPLIANCE WITH ASTM D1557. CONTRACTOR TO INCLUDE COST OF 3RD PARTY INSPECTION SERVICES FOR COMPACTION TESTING.
- PLACE WATERMAIN PIPE AND WATER SERVICE TUBING ON PREPARED FLAT BOTTOMED TRENCH FREE OF ROCK. BACKFILL WITH APPROVED NATIVE OR IMPORTED MATERIAL AND COMPACT IN ACCORDANCE WITH MMCD - G4 SHOWN OF C-04. USE HAND TOOLS TO COMPACT MATERIAL UNDER 'HAUNCH' AREA OF PIPE AND AROUND FITTINGS AND OTHER MATERIALS.
- USE IMPORTED BEDDING MATERIAL WHEN NATIVE MATERIAL IS DEEMED UNSUITABLE FOR BACKFILL BY CONTRACT ADMINISTRATOR OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK.
- USE IMPORTED BEDDING WHEN PROPOSED WORK IS INSTALLED THROUGH PAVED AREAS, WHEN NATIVE MATERIAL IS DEEMED UNSUITABLE FOR BACKFILL BY CONTRACT ADMINISTRATOR OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK.

PIPE INSTALLATION

- HANDLE PIPE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DO NOT USE CHAINS OR CABLES PASSED THROUGH PIPE BORE SO THAT WEIGHT OF PIPE BEARS ON PIPE ENDS.
- LAY AND JOIN PIPES TO MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS EXCEPT AS NOTED OTHERWISE HEREIN. PVC PIPE TO AWWA M23 AND AWWA C605; DUCTILE IRON PIPE TO AWWA C600.
- ADDITIONALLY FOLLOW SPECIFICATIONS AS LAID OUT IN MMCD SECTION 33 11 01, 3.6 PIPE INSTALLATION.

VALVE INSTALLATION

- INSTALL VALVES TO MANUFACTURER'S RECOMMENDATIONS AT LOCATIONS SHOWN ON CONTRACT DRAWINGS AND AS SPECIFIED IN MMCD SECTION 33 11, 3.7-VALVE INSTALLATION.
- VALVES TO BE INSTALLED IN VERTICAL POSITION WITH ACTUATING STEM PLUMB.

JOINT RESTRAINT DEVICES

- JOINT RESTRAINT DEVICES TO BE USED AT ALL VALVES, TEES, CROSSES, PLUGS, CAPS, BENDS, CHANGES IN PIPE DIAMETER, REDUCERS, HYDRANTS AND FITTINGS AS SPECIFIED IN MMCD SECTION 33 11 01, 2.2.4.13 AND AS SHOWN ON JOINT RESTRAINT DETAIL.

CORROSION PROTECTION

- WHERE SPECIFIED, PROVIDE CORROSION PROTECTION MEASURES AS PER SECTION 26 42 13 - CATHODIC PROTECTION OF THE MMCD SPECIFICATIONS.

PIPE SURROUND

- UPON COMPLETION OF PIPE LAYING AND AFTER CONTRACTOR ADMINISTRATOR HAS INSPECTED WORK IN PLACE, SURROUND AND COVER PIPES AS SHOWN ON STANDARD DETAIL DESIGN DRAWING G4.
- HAND PLACE SURROUND MATERIAL IN UNIFORM LAYERS SIMULTANEOUSLY ON BOTH SIDES OF PIPE. DO NOT DUMP MATERIAL WITHIN 1 m OF EXPOSED PIPE.
- COMPACT EACH LAYER FROM PIPE INVERT TO UNDERSIDE OF BACKFILL TO MINIMUM 95% MODIFIED PROCTOR DENSITY.

GENERAL PROCEDURE - FLUSHING, TESTING AND DISINFECTION

- ALL CLEANING, FLUSHING, PRESSURE AND LEAKAGE TESTING, DISINFECTION AND FINAL FLUSHING TO BE DONE BY CONTRACTOR.
- PERFORM ALL TESTS IN PRESENCE OF CONTRACT ADMINISTRATOR AND CITY OPERATOR. NOTIFY CONTRACT ADMINISTRATOR 24 HOURS IN ADVANCE OF PROPOSED TEST.
- OBTAIN MUNICIPAL APPROVAL PRIOR TO DISCHARGING FLUSHING WATER TO MUNICIPAL SEWERS OR DRAINAGE DITCHES.
- COMPLY WITH GENERAL CONDITIONS, CLAUSE 20.4, ENVIRONMENTAL LAWS, IN REGARD TO DISCHARGING FLUSHING WATER.
- PROVIDE CONTRACT ADMINISTRATOR WITH ALL REQUIRED APPROVALS PRIOR TO DISCHARGING FLUSHING WATER.
- CLEANING AND PRELIMINARY FLUSHING TO BE PERFORMED IN ACCORDANCE TO 3.18 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.
- UPON COMPLETION OF CONSTRUCTION OF ANY SECTION, WHICH SHALL BE DEFINED AS THAT PIPELINE AND APPURTENANCES LOCATED BETWEEN ANY TWO ADJACENT LINE VALVES, MAKE SECTION READY FOR TESTING. CARRY OUT TESTING IN ACCORDANCE WITH 3.19 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.
- AFTER CONTRACT ADMINISTRATOR HAS CERTIFIED THAT PIPES AND APPURTENANCES HAVE PASSED ALL SPECIFIED TESTS, FLUSH AND DISINFECT PIPES AND APPURTENANCES.
- DISINFECT AND FLUSH IN ACCORDANCE WITH 3.21 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.

CONNECTIONS TO EXISTING MAINS

- CONTRACTOR TO MAKE ALL NECESSARY ARRANGEMENTS WITH OWNER OF WATERWORKS SYSTEMS AND CONTRACT ADMINISTRATOR TO SCHEDULE WORK FOR CONNECTION TO EXISTING WATERWORKS SYSTEM. TO ENSURE NO DISRUPTION IN SERVICE TO CUSTOMERS, RESIDENTS OR BUILDINGS, USE VALVE INSERT, HOT TAP OR LINE STOP FOR CUT-IN.

EXCAVATING, TRENCHING AND BACKFILLING

- REFERS TO THOSE PORTIONS OF THE WORK THAT ARE UNIQUE TO EXCAVATING, TRENCHING AND BACKFILLING OF UNDERGROUND UTILITY INSTALLATIONS AND RELATED STRUCTURES.

MATERIALS

- REFER TO SECTION 31 05 17 - AGGREGATES AND GRANULAR MATERIALS IN THE MMCD SPECIFICATIONS FOR APPROVED GRANULAR MATERIALS AND APPROVED NATIVE MATERIAL.
- OTHER GRANULAR MATERIALS: GRANULAR MATERIALS APPROVED FOR ROADWORK (SUBBASE, BASE) ARE ALSO ACCEPTABLE FOR TRENCH BACKFILL SUBJECT TO APPROVAL OF CONTRACTOR ADMINISTRATOR.
- CONCRETE: TO SECTION 03 30 53 - CAST-IN-PLACE CONCRETE, OF THE MMCD SPECIFICATIONS TO BE MINIMUM 20 MPa.
- CONTROLLED DENSITY FILL: TO SECTION 31 23 23 - CONTROLLED DENSITY FILL OF THE MMCD SPECIFICATIONS, TO BE MAXIMUM 0.5 MPa.

SITE PREPARATION AND STOCKPILING

- REMOVE ALL BRUSH, WEEDS, GRASSES AND ACCUMULATED DEBRIS TO AN APPROVED OFFSITE LOCATION.
- CUT PAVEMENT OR SIDEWALK NEATLY ALONG LIMITS OF PROPOSED EXCAVATION AS SHOWN ON STANDARD DETAIL DRAWING G4 IN ORDER THAT SURFACE MAY BREAK EVENLY AND CLEANLY. CUT BEYOND LIMITS SHOWN ONLY IF AUTHORIZED BY CONTRACT ADMINISTRATOR.
- WHERE TRENCH PASSES THROUGH LAWN, NEATLY CUT AND REMOVE SOD BEFORE TRENCH EXCAVATION. SAVE SOD FOR REPLACEMENT UPON BACKFILLING TRENCH.
- STRIP TOPSOIL AFTER AREA HAS BEEN CLEARED AND STOCKPILE IN LOCATIONS AS SHOWN ON CONTRACT DRAWINGS OR DESIGNATED BY MUNICIPALITY. STOCKPILE HEIGHT NOT TO EXCEED 2 m. AVOID MIXING TOPSOIL WITH SUBSOIL. DISPOSE OF UNUSED TOPSOIL AS SPECIFIED. DO NOT HANDLE TOPSOIL WHILE IN WET OR FROZEN CONDITION OR IN ANY MANNER IN WHICH SOIL STRUCTURE IS ADVERSELY AFFECTED.
- STOCKPILE FILL MATERIALS IN AREAS DESIGNATED BY CONTRACT ADMINISTRATOR. STOCKPILE GRANULAR MATERIALS IN MANNER TO PREVENT SEGREGATION.

EXCAVATION AND PIPE INSTALLATION

- EXCAVATE TRENCHES TO ALLOW PIPE TO BE LAID TO ALIGNMENT AND THE GRADES REQUIRED WITH ALLOWANCE FOR SPECIFIED PIPE BEDDING, EXCAVATING, TRENCHING AND BACKFILLING.
- EXCAVATION TO BE PERFORMED TO 3.3- EXCAVATION, OF SECTION 31 23 01 , EXCAVATING, TRENCHING, AND BACKFILL, OF THE MMCD SPECIFICATIONS.
- PIPE INSTALLATION TO BE PERFORMED TO 3.4, PIPE INSTALLATION, OF SECTION 31 23 01, EXCAVATING, TRENCHING AND BACKFILL, OF THE MMCD SPECIFICATIONS. INSTALL PIPE PER MMCD G4.

BACKFILL AND COMPACTION

- PLACE AND COMPACT BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 31 23 01 - EXCAVATION, TRENCHING AND BACKFILLING.
- BACKFILL REQUIREMENTS, INCLUDING TYPE OF MATERIAL AND COMPACTION REQUIREMENTS AS SHOWN ON CONTRACT DRAWINGS, INCLUDING STANDARD DETAIL DRAWING G4.
- PLACE BACKFILL CAREFULLY IN TRENCH TO PREVENT DAMAGE TO INSTALLED PIPE.
- DURING BACKFILL AND COMPACTION OF TRENCH, REMOVE SHORING IN SUCH A MANNER AS TO ALLOW PROPER COMPACTION AND TO PREVENT TRENCH WALLS FROM COLLAPSING. REMOVE ALL BRACING AND/OR SHORING FROM TRENCH.
- FOR BACKFILL MATERIALS AND DIRECTIONS FOLLOW 3.5.3. BACKFILL MATERIALS, OF SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- PLACE BACKFILL AND COMPACT TO FOLLOWING MODIFIED PROCTOR DENSITIES IN COMPLIANCE WITH ASTM D1557.
- BOULEVARDS AND EASEMENTS TO 90% MIN.
- ROADS, DRIVEWAYS, SHOULDERS, RE-SHAPED DITCHES AND SIDEWALKS TO 95% MIN.
- USE CAUTION IN PIPE ZONE TO ENSURE NO DAMAGE TO PIPE.

SURFACE RESTORATION

- RESTORE ALL DISTURBED SURFACES TO CONDITION AT LEAST EQUAL TO THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
- REPAIR ANY DAMAGE TO ADJACENT LANDS OR IMPROVEMENTS.
- RESOLVE ALL REASONABLE CLAIMS ARISING FROM CONTRACTOR'S ACTIONS AND OBTAIN WRITTEN RELEASES FROM LAND OWNERS FOLLOWING FINAL RESTORATION.
- RESTORE BOULEVARDS AND EASEMENTS IN ACCORDANCE WITH 3.6.2 - BOULEVARDS AND EASEMENTS, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- RESTORE GRAVELED ROADS AND DRIVEWAYS IN ACCORDANCE WITH 3.6.3 - GRAVELED ROADS AND DRIVEWAYS, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- RESTORE DITCHES IN ACCORDANCE WITH 3.6.4 - DITCHES, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- BASE PREPARATION FOR PAVED SURFACES IN ACCORDANCE WITH 3.6.5 - BASE PREPARATION FOR PAVED SURFACES, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- TEMPORARY PAVEMENT PATCHING IN ACCORDANCE WITH 3.6.6 - TEMPORARY PAVEMENT PATCHING, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- PERMANENT PAVEMENT RESTORATION IN ACCORDANCE WITH 3.6.7 - PERMANENT PAVEMENT RESTORATION, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.



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Client

CITY OF WHITE ROCK
BRITISH COLUMBIA

Project

ROPER RESERVOIR INLET

2	ISSUED FOR TENDER	DJW	CB	Jul. 23, 2019
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1	ISSUED FOR 95% REVIEW	DJW	CB	Mar. 29, 2019
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No.	Issue	Drawn	Approved	Date
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Drawn	D.WHITFIELD	Designer	D.WHITFIELD
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Drafting Check	T.GERMSHEILD	Design Check	D.HARTY
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Project Manager	C. BAECHLER	Date	Jul. 23, 19
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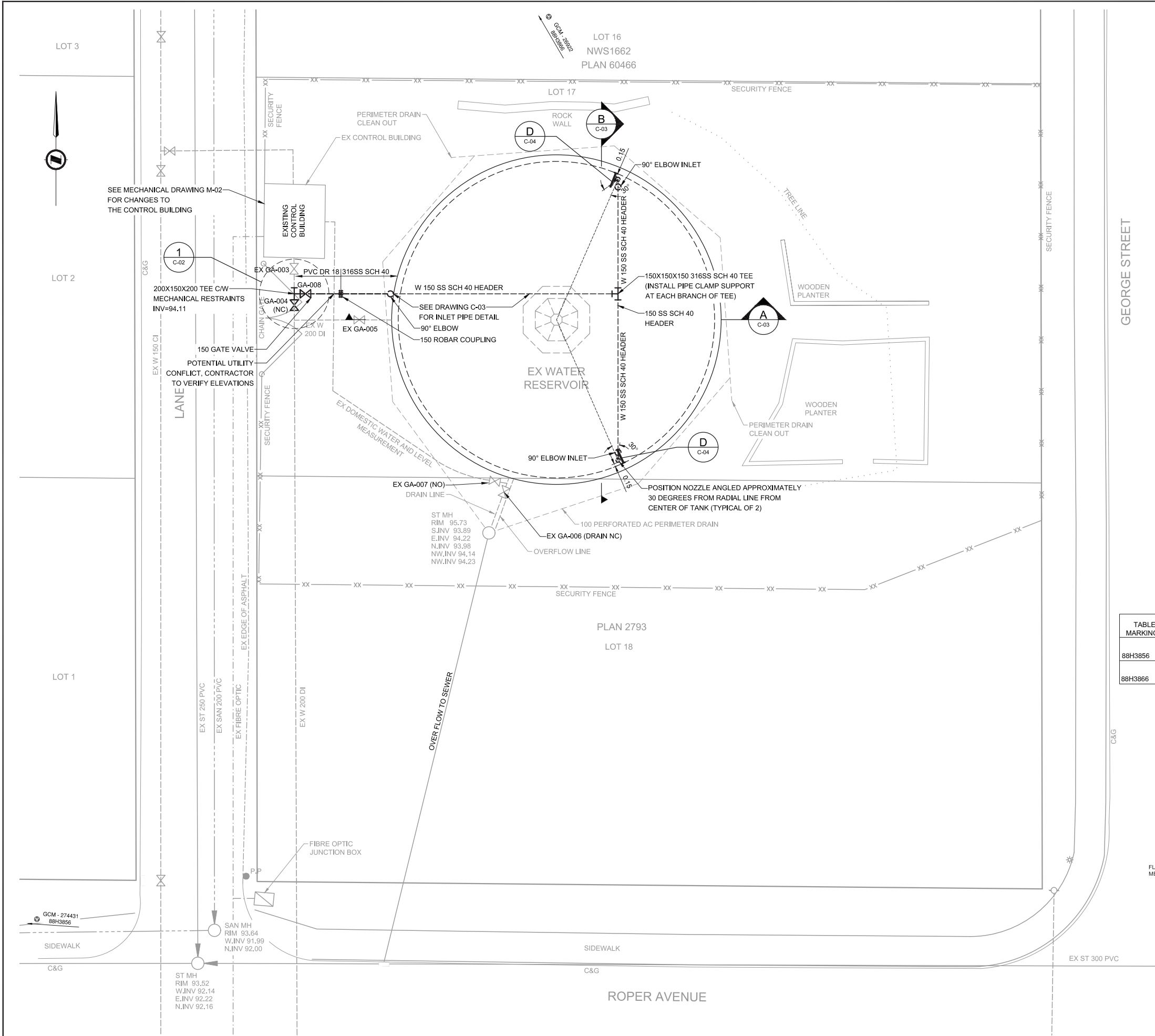
Project No. 11181229-01(004)

Title

CIVIL
SPECIFICATIONS

Sheet No.

C-01



LEGEND

EXISTING CONDITIONS

FIBRE OPTIC	W 200
WATER MAIN	
WATER VALVE	
HYDRANT	
SANITARY MANHOLE	S.M.H. S 200
STORM MANHOLE	ST.M.H. ST 375
CATCH BASIN & LEAD	
GAS	
TELECOMMUNICATION MANHOLE	TEL.M.H.
LIGHT STANDARD	P.P.
POWER POLE	
UTILITY PEDESTAL	
TREELINE	
TREE	
FENCE (SECURITY)	XX
BUILDING	
EDGE OF ASPHALT	C&G
CURB AND GUTTER	

PROPOSED CONDITIONS

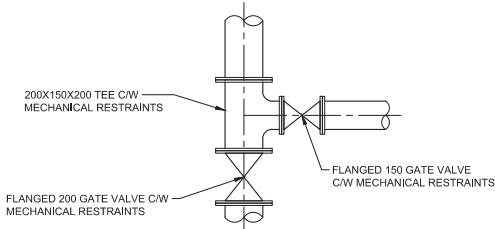
WATER MAIN	W 150
WATER VALVE	

GENERAL NOTES

- DIMENSIONS ON DRAWINGS ARE IN METERS UNLESS OTHERWISE NOTED. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
- PIPE SIZES ARE SHOWN IN NOMINAL mm SIZES.
- ALL EXISTING UTILITIES MUST BE INDEPENDENTLY VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND OTHER SITE SPECIFIC FEATURES THAT ARE REQUIRED TO REMAIN INTACT DURING THE COURSE OF CONSTRUCTION.
- WATER MAINS TO BE CONSTRUCTED WITH A MINIMUM OF 1.0m COVER.
- PLACE JOINT RESTRAINT DEVICES AT UNDERGROUND PIPE CONNECTIONS TO VALVES, TEES, PLUGS, CAPS, BENDS, CHANGES IN PIPE SIZE, REDUCERS, HYDRANTS AND FITTINGS. SEE DETAIL ON DRAWING C-04.
- ALL PIPE STRAPS AND SUPPORTS REQUIRED TO SECURE SS SCH 40 WATER LINES TO THE EXISTING CONCRETE RESERVOIR ARE TO BE DESIGNED AND SUPPLIED BY THE CONTRACTOR, C/W SHOP DRAWINGS FOR APPROVAL BY ENGINEER.

CONTROL POINTS

TABLE MARKINGS	NAME	NORTHING	EASTING	LOCATION DESCRIPTION
88H3856	GCM - 274431	5430345.676	514545.381	JOHNSTON RD & ROPER AVE
88H3866	GCM - 26922	5430532.470	514521.852	JOHNSTON RD & THRIFT AVE



1 TEE CONNECTION DETAIL
C-02 1:20



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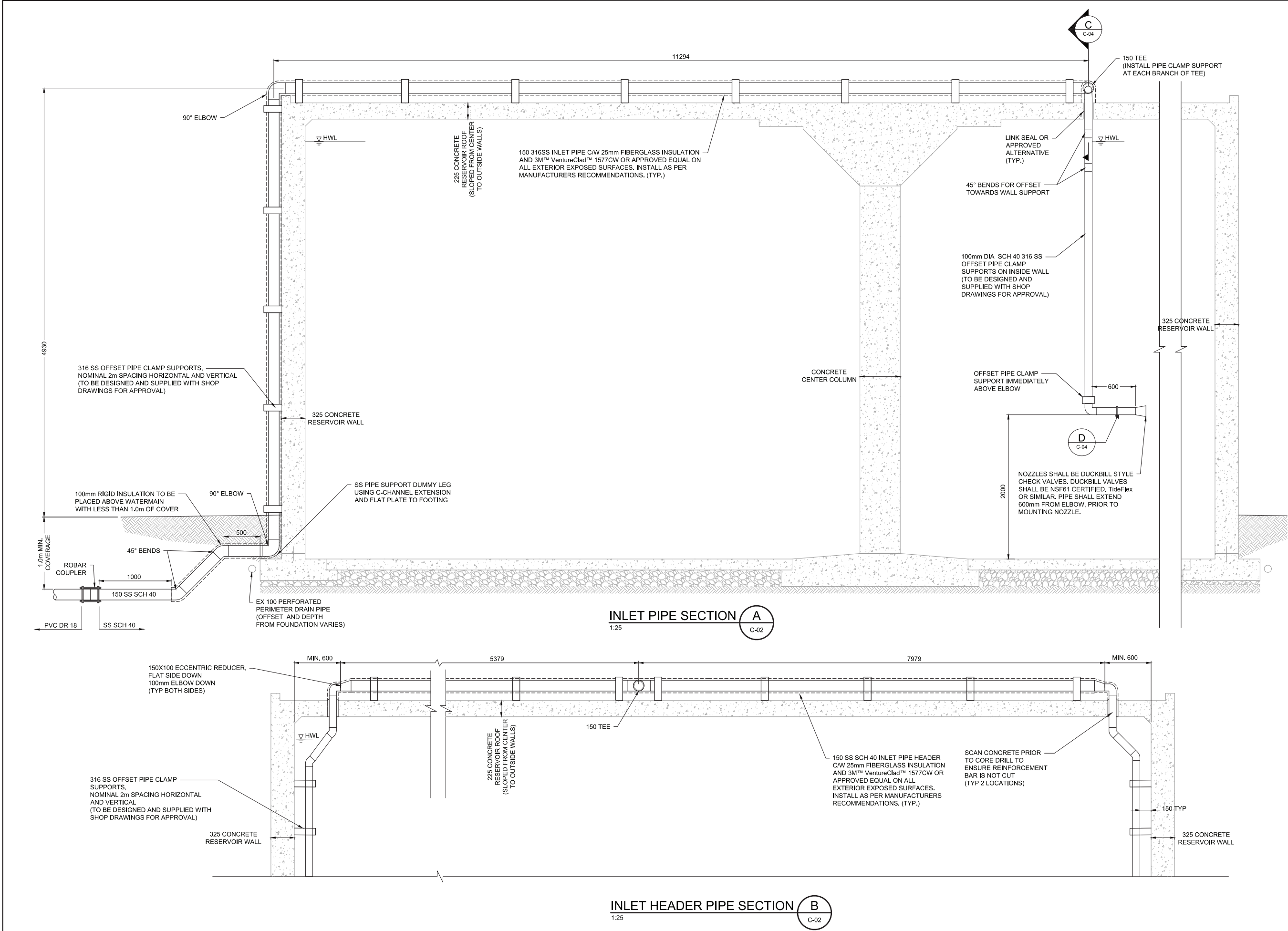
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Project Manager	C.BAECHLER	Date	Mar. 29, 2019
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Project No. 11181229-01(004)

Title
**CIVIL
SITE PLAN**

Sheet No.

C-02



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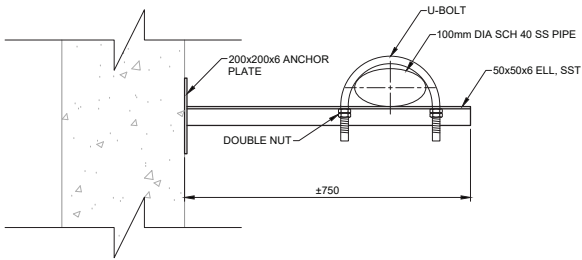


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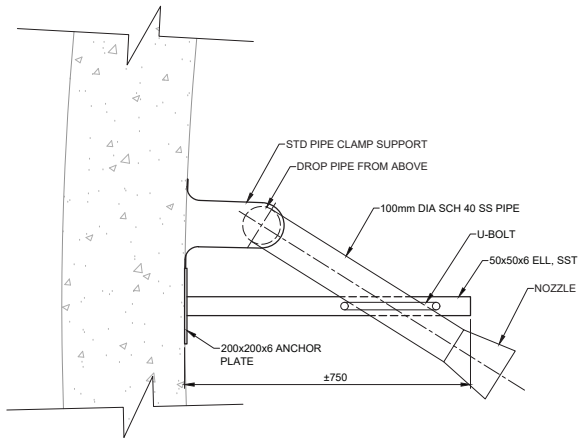
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Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER	
Project Manager	C.BAECHLER	Date	Mar. 29, 2019	
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Title
**CIVIL CONSTRUCTION
INLET PIPE DETAIL**

Sheet No.
C-03



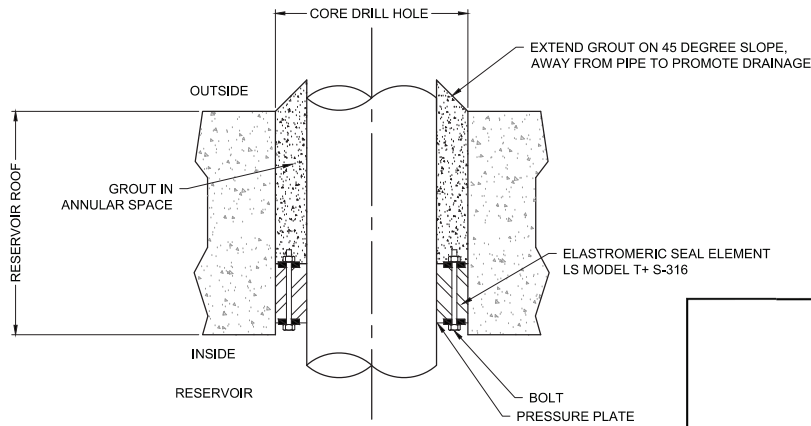
SIDE VIEW



PLAN VIEW

HORIZONTAL NOZZLE SUPPORT

NTS

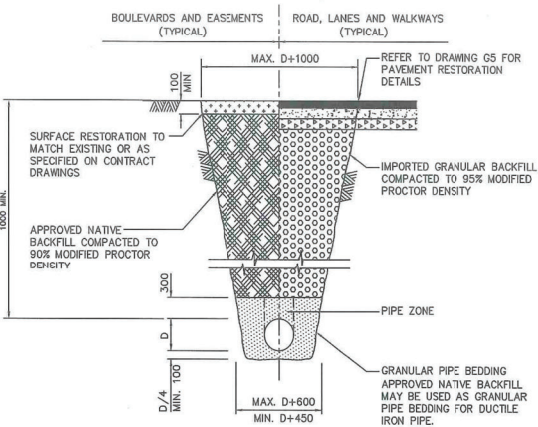


WALL PENETRATION DETAIL

NTS



MMCD STANDARD DETAIL DRAWINGS



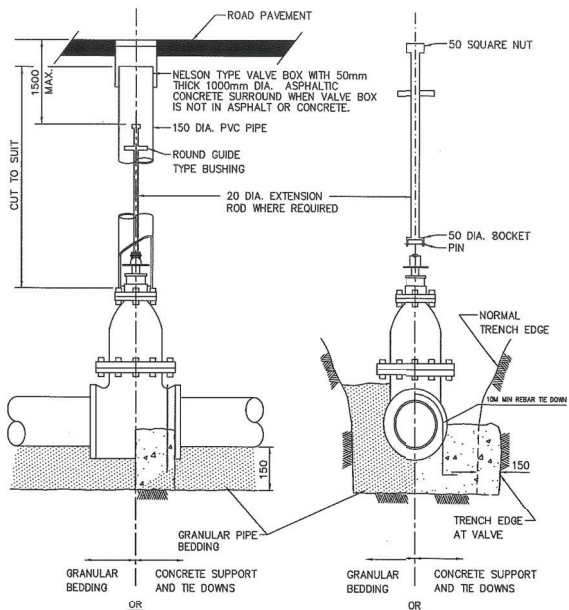
NOTE: 1. TRENCHING TO COMPLY WITH ALL REQUIREMENTS OF WORKSAFE BC.
2. REFER TO CONTRACT DRAWINGS, SECTION 31 23 01 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

UTILITY TRENCH

DRAWING NUMBER:
G4

MMCD STANDARD DETAIL DRAWINGS



NOTE: 1. REFER TO CONTRACT DRAWINGS FOR VALVE INSTALLATION DETAILS IN AREAS OF UNSTABLE GROUND (WHERE APPLICABLE).
2. REFER TO CONTRACT DRAWINGS, SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.

NOT TO SCALE

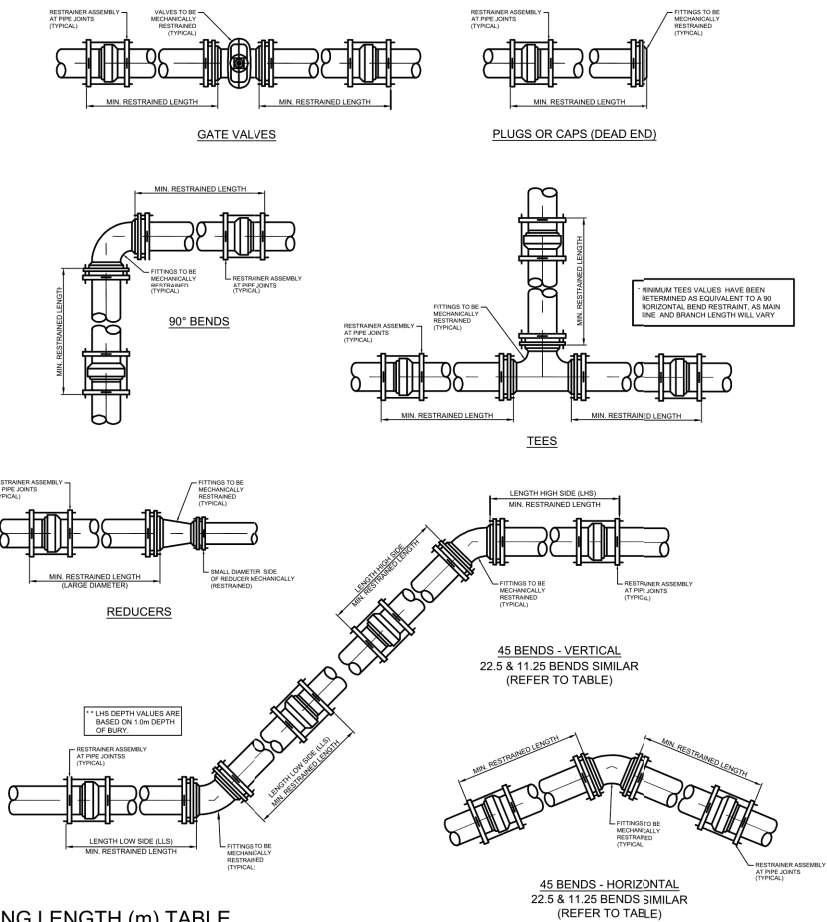
GATE VALVE INSTALLATION

DRAWING NUMBER:
W3

MINIMUM RESTRAINING LENGTH (m) TABLE

DESCRIPTION	PIPE DIAMETER (mm)		
	1500	2000	3000
VALVES, DEAD ENDS, CAPS, PLUGS EITHER SIDE OF VALVES AND BEFORE CAPS OR PLUGS	12.3	13.5	19.0
TEES* SIZE ON SIZE OR READING TEES	6.9	4.5	12.5 _(a)
TEES* 11.25° BENDS	0.7	1.0	1.0
22.5° BENDS	1.4	1.5	1.5
45° BENDS	2.9	2.0	3.0
90° BENDS	6.9	4.5	12.5 _(a)
45° VERTICAL BENDS ** LENGTH HIGH SIDE - LHS (BASED ON 1.0m COVER) LENGTH HIGH SIDE - LSS (DEPTH > 1.0m)	2.9 + ONE ADDITIONAL RESTRAINT 2.9	6.0 2.0	8.0 3.0
22.5° & 11.25° VERTICAL BENDS ** LENGTH HIGH SIDE - LHS (BASED ON 1.0m COVER) LENGTH HIGH SIDE - LSS (DEPTH > 1.0m)	1.4 + ONE ADDITIONAL RESTRAINT 1.4	3.0 1.5	4.0 1.5
REDUCERS SMALL DIAMETER SIDE (mm)	LARGE DIAMETER SIDE (mm)		
	1500	2000	3000
1000	5.5	10.0	16.5
1500	n/a	6.0	14.0
2000	n/a	n/a	10.5
2500	n/a	n/a	6.0
3000	n/a	n/a	n/a
4000	n/a	n/a	n/a

TABLE VALUES BASED UPON EBAA 'CL (GRANULAR)' SOIL TYPES
(Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays - backfill with granular material)
(a) 300 Ø PIPE DIAMETER TABLE VALUES FOR 90° BENDS AND TEES HAVE BEEN INCREASED TO 12.5m MINIMUM LENGTHS.



TYPICAL MECHANICAL JOINT RESTRAINTS

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Project

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2 ISSUED FOR TENDER LG CB Jul. 23, 19

1 ISSUED FOR 95% REVIEW DJW CB Mar. 29, 19

No.	Issue	Drawn	Approved	Date
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Drawn D.WHITFIELD Designer D.WHITFIELD

Drafting Check T.GERMSHEID Design Check C.BAELCHER

Project Manager C.BAELCHER Date Mar. 29, 2019

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Title

**CIVIL
CONSTRUCTION DETAILS**






Sheet No.

C-04

Sheet 4 of 4

LCP-01

ABBREVIATIONS:

ARV	AIR RELEASE VALVE
CH	CHECK VALVE
FE	FLOW ELEMENT
FIT	FLOW INDICATING TRANSMITTER
GA	GATE VALVE
ISV	ISOLATION VALVE
LIT	LEVEL INDICATOR TRANSMITTER
PI	PRESSURE INDICATION
PIT	PRESSURE INDICATING TRANSMITTER
PRV	PRESSURE REGULATING VALVE
SV	SOLENOID VALVE
	GLOBE VALVE
	GATE VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	COUPLING (TRANSITION)






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KEY NOTES:

- ① EXISTING TO BE RELOCATED
F.W.  FIELD WELD AND INSTALL
 EXISTING
 NEW

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Project Manager	C.BAECHLER	Date	Mar. 29, 2019
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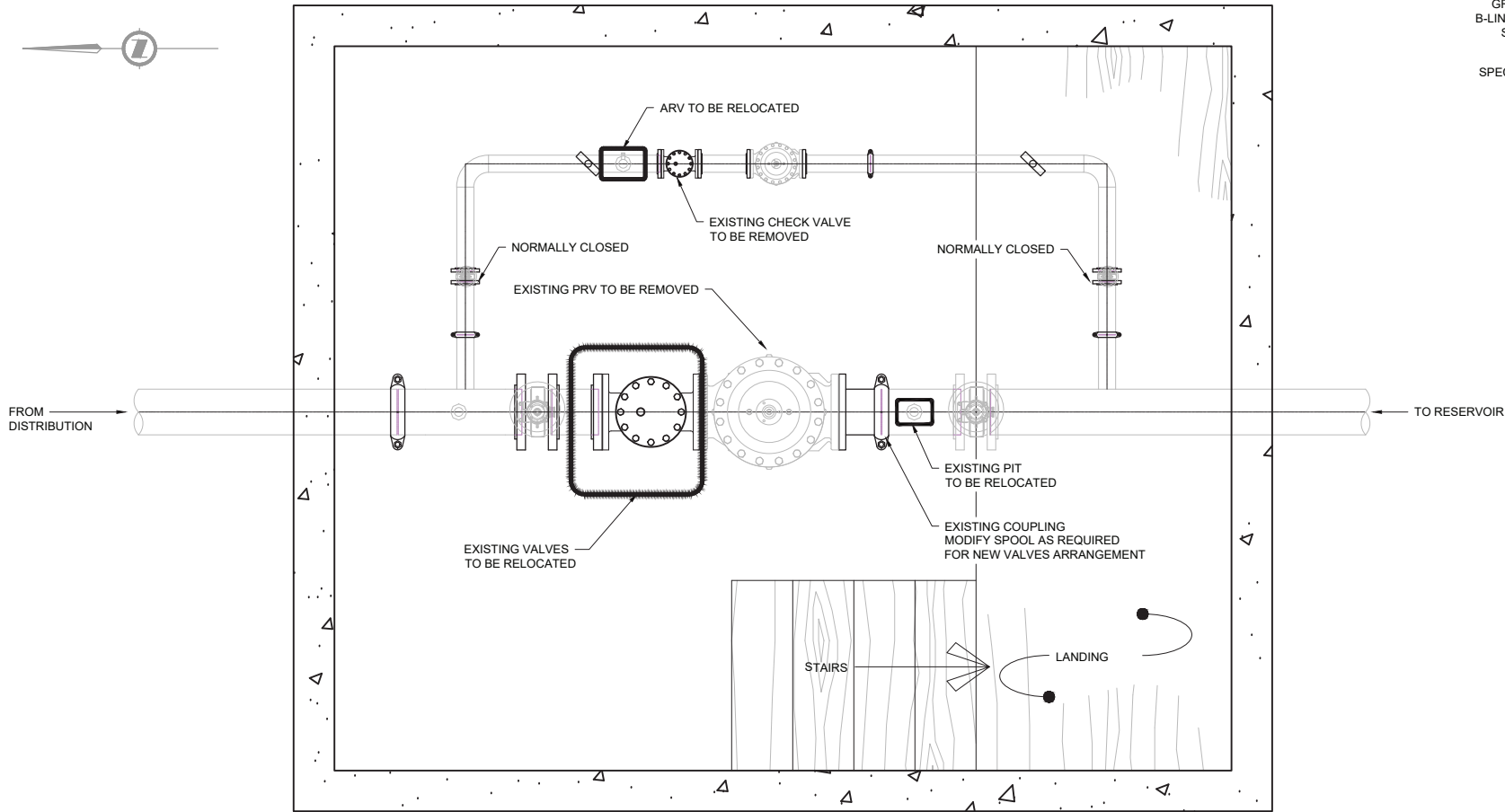
Project No. 11181229-01(004)

Title

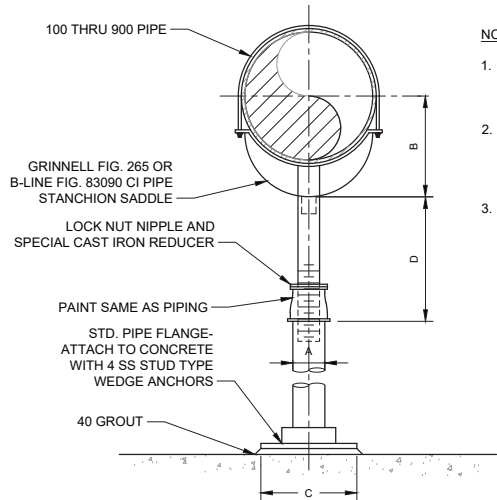
PROCESS FLOW AND
INSTRUMENTATION DIAGRAM

Sheet No.

P-01



PLAN VIEW
1:12.5



NOTES:

1. PROVIDE HALF RIGID INSULATION AND INSULATION PROTECTION SHEILD, GRINNELL FIGURE 167 OR ELCEN FIGURE 219 WHERE PIPING IS INSULATED.
2. PROVIDE NEOPRENE WAFFLE ISOLATION PAD SIMILAR TO MASON TYPE 'W' OR KORFUND KORPAD 40, UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
3. FOR BASE HEIGHT AND FLANGE DIMENSIONS, SEE TABLE.

PIPE SIZE	A (MIN.)	B (MAX.)	C	D (MIN.)	D (MAX.)
100-300	75	250	225	200	225
350-450	100	350	275	400	525
500-900	150	575	325	525	650

PIPE SUPPORT DETAIL

A

NTS C-03

MECHANICAL SPECIFICATIONS

1. GENERAL

THE GENERAL CONDITIONS OF THE CONTRACT, GENERAL REQUIREMENTS, FORM AN INTEGRAL PART OF THE REQUIREMENTS OF THIS SECTION.

 - 1.1 GENERAL REQUIREMENTS
 - 1 THE COMPLETE INSTALLATION SHALL BE INSTALLED TO THE APPROVAL OF ALL LOCAL AND PROVINCIAL CODES, REGULATIONS AND LOCAL INSPECTION.
 - 2 MANUFACTURER'S REQUIREMENTS OVER AND ABOVE THOSE SHOWN OR SPECIFIED SHALL BE ADHERED TO.
 - 3 SUBMIT THREE (3) HARD COPIES OF MAINTENANCE MANUALS AND ONE (1) COPY IN PDF FORMAT.
 - 4 HYDRO TEST ALL NEW PIPE TO ONE AND A HALF TIMES THE DESIGN PRESSURE (MINIMUM TEST PRESSURE IS 690 KPA (100PSI)) IN ACCORDANCE WITH ANSI B31.3.
 - 5 WELDING CODES AND STANDARDS SHALL BE IN ACCORDANCE WITH CSA STANDARD Z183, LATEST VERSION
 - 6 WHEN THE WORK HAS BEEN COMPLETED AND WARRANTS TESTED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THIS INTENTION TO TEST, AND SHALL OUTLINE HIS PLANS FOR TESTING PROCEDURE AND TIMING. THE CONTRACTOR, HOWEVER, MUST MAKE HIS PERMISSION TO TEST BY ENGINEER DOES NOT IN ANY WAY RELIEVE HIM FROM FINAL RESPONSIBILITY FOR ALL ASPECTS OF OPERATING THE EQUIPMENT AND DAMAGE ARISING OUT OF THE OPERATION OF THE EQUIPMENT.
 - 7 THE CONTRACTOR MAY QUOTE ON ALTERNATES, IF ACCEPTED BY THE ENGINEER AS EQUIVALENT. PRICING SHALL BE PROVIDED FOR ORIGINALLY SPECIFIED PRODUCT AND ALTERNATE. ALTERNATES ARE TO BE CLEARLY MARKED AS SUCH.
 - 8 GUARANTEE AFTER WORK AND EQUIPMENT INSTALLED FOR TWELVE (12) MONTHS AFTER CERTIFICATION OF COMPLETION.
 - 9 OBTAIN NECESSARY PERMITS PAY ALL APPLICABLE FEES. ON COMPLETION, OBTAIN A CERTIFICATE OF APPROVAL FROM THE LOCAL INSPECTION DEPARTMENT, TURN OVER THE CERTIFICATE(S) TO ENGINEER.
 2. PRODUCTS
 - 2.1 PIPE MATERIAL STANDARD
 - 1 ALL PIPE SHALL BE SCH 40 316 SS.
 - 2 FITTINGS, ANSI A21-10/AWWA C110 DIMENSIONALLY AND AWWA C153 FOR WALL THICKNESS
 - 3 FLANGES: ALL REQUIRED SIZES TO ANSI/AWWA C110/A210.10 WITH DRILLING AND FACING TO USAS STANDARD B16.1, CLASS 125.
 - 4 GASKETS: 2MM (1/16 INCH) FULL FACE RED RUBBER.
 - 5 BOLTS AND NUTS: HEX-HEAD BOLTS AND NUTS ASTM A193 B8 BOLTS TO ASTM A194 B8 NUTS, UTILIZE PLATED STEEL BOLTING FOR GROOVED JOINT COUPLERS.
 - 6 PIPE COUPLING: VICTAULIC STYLE 31 FOR RATED WORKING PRESSURE OF 150 PSI MINIMUM, AWWA FLUSH SEAL, CLASS M GASKETS. FOR PRESSURE SUCTION PIPING SHALL BE MANUFACTURE'S RECOMMENDATION FOR VACUUM APPLICATION; FLUSH SEAL MODELED GASKETS AS SUPPLIED BY VICTAULIC OR APPROVED EQUAL.
 - 2.2 PIPE PROTECTION
 - 1 ALL UNDERGROUND STEEL/IRON, COUPLINGS, PIPE AND FITTINGS SHALL BE TAPE COATED IN ACCORDANCE WITH AWWA C209-90.
 - 2 ALL STEEL /IRON PIPE AND FITTINGS SHALL BE INTERNALLY SHOP COATED IN ACCORDANCE WITH THE AWWA STANDARD C210-78.
 - 2.3 PAINT FINISH
 - 1 ALL INTERIOR/EXTERIOR NON-STAINLESS STEEL PROCESS PIPING SHALL BE PAINTED WITH IN-13-A PREMIUM, SEMI-GLOSS. ALL SHOP PRE-PAINTED EQUIPMENT TO BE LEFT AS FACTORY FINISHED.
 - 2 COLOR SCHEDULE WILL BE PROVIDED BY THE OWNER.
 3. INSTALLATION
 - 3.1 MECHANICAL
 - 1 INSTALL EQUIPMENT IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE RESPECTIVE EQUIPMENT MANUFACTURE, EXCEPT WHERE MORE STRINGENT PROCEDURES ARE NOT CLEAR OR NOT COMPLETE, THE BEST MODERN PRACTICE SHALL BE FOLLOWED, SUBJECT TO THE APPROVAL OF THE RESIDENT ENGINEER.
 - 2 THE EQUIPMENT AND MACHINERY SHALL BE ASSEMBLED, PROPERLY LOCATED, POSITIONED AND FASTENED SECURELY IN SUCH A MANNER AS TO GIVE PROPER PERFORMANCE.
 4. VALVES
 - 1 PRESSURE REDUCING VALVE - CLA-VAL E-90-01 WITH SOLENOID VALVE
 5. FLOW METER
 - 1 CLA-VAL X144D E-FLOWMETER WITH DISPLAY



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3	ISSUED FOR TENDER	LG	CB	Jul. 23, 19
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2	ISSUED FOR 95% REVIEW	DJW	CB	May 28, 19
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No.	Issue	Drawn	Approved	Date
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Drawn	S.BASHIR	Designer	D.ZHANG
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Project Manager	C.BAECHLER	Date	Mar. 29, 2019
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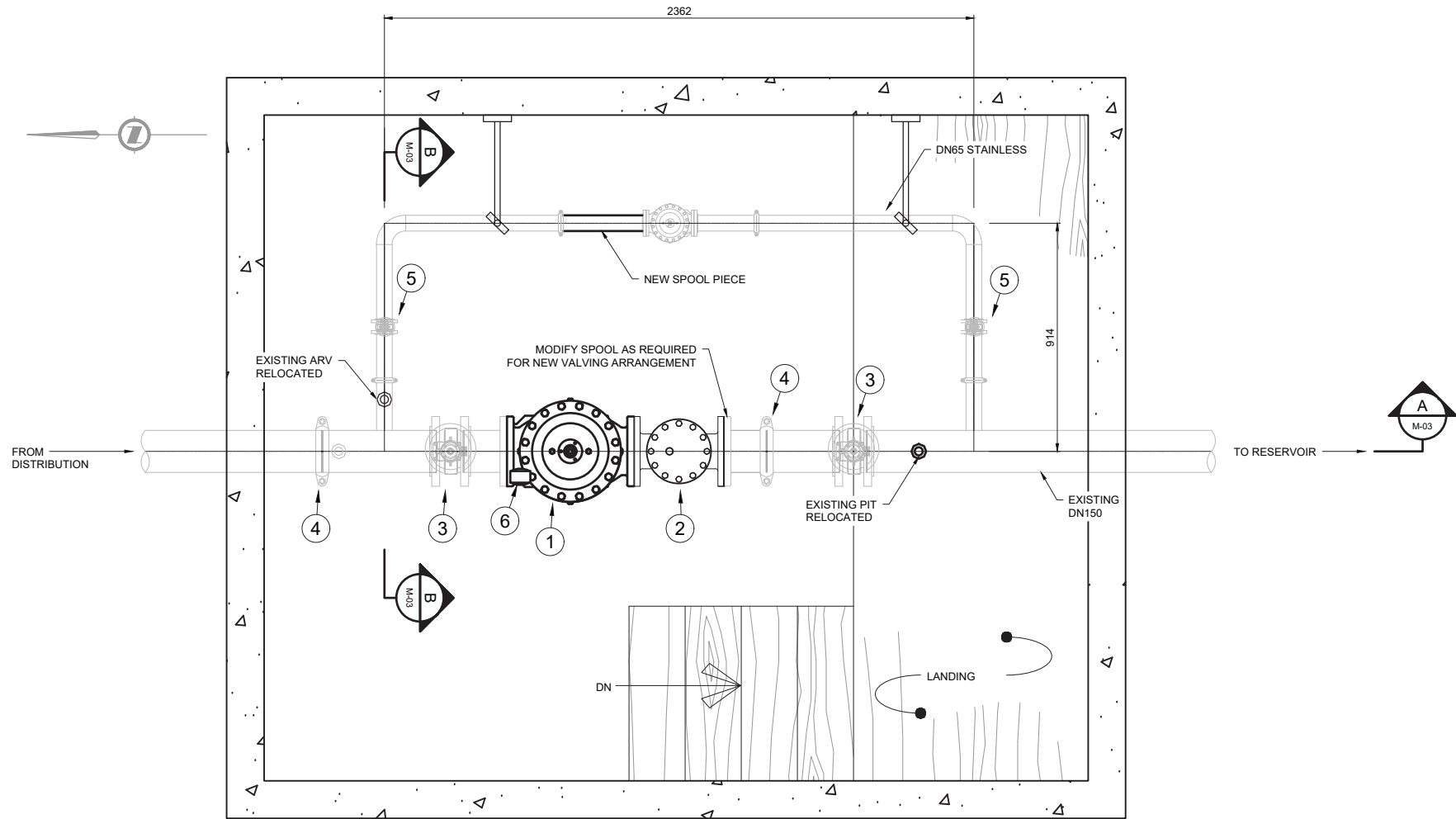
Project No. 11181229-01(004)

Title

EXISTING CONTROL BUILDING
MECHANICAL CHANGES
DETAILS AND SPECIFICATIONS

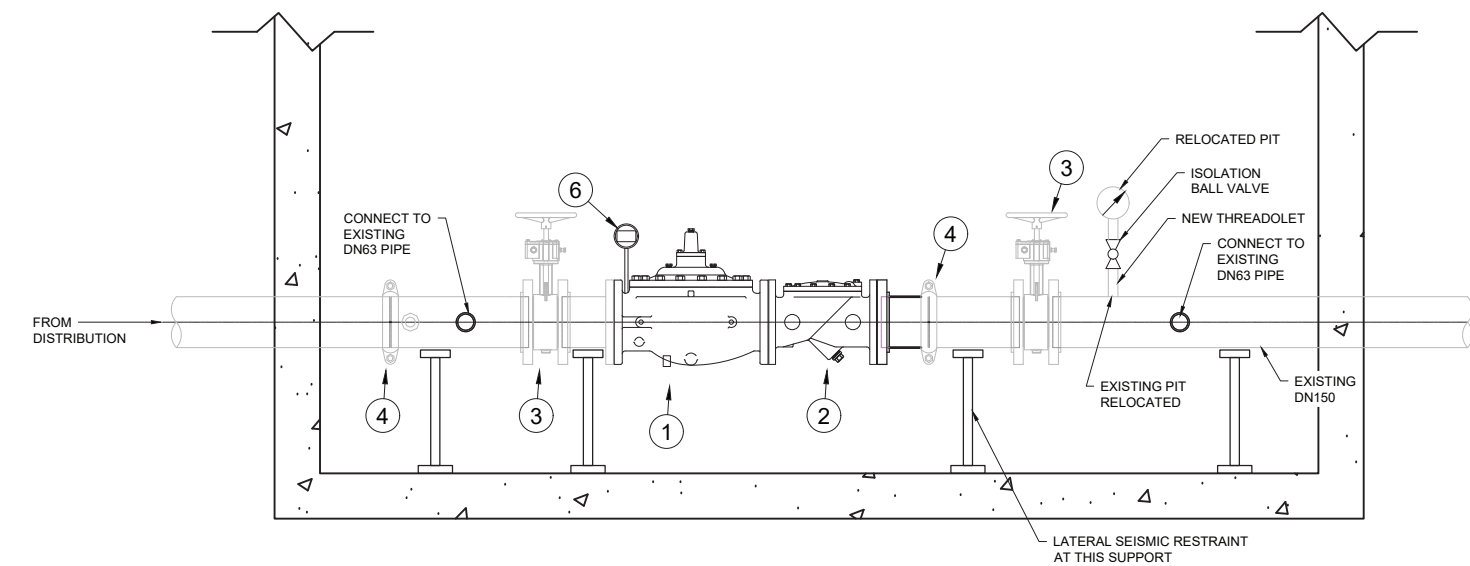
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M-01

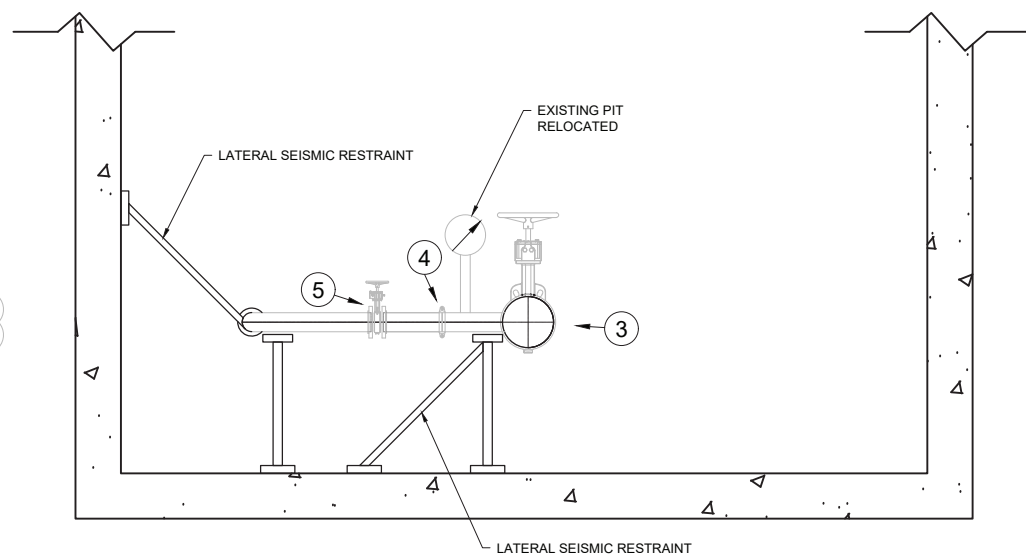


PLAN VIEW
1:12.5

MATERIALS LIST		
ITEM	QTY	DESCRIPTION
1	1	150 (6") CLA-VAL Flow Control Valve w/ S.S. Trim, Epoxy Coating and Position Indicator
2	1	150 (6") Existing Check Valve To Be Relocated
3	2	150 (6") Existing Gate Valve
4	2	150 (6") Existing VICTAULIC 89 Rigid Coupling
5	2	Existing S.S. Isolation Butterfly Valve
6	1	E-FlowMeter With Display



ELEVATION VIEW A
1:12.5

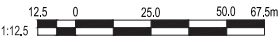


SECTION VIEW B
1:12.5



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Project Manager	C.BAECHLER	Date	Mar. 29, 2019	
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Project No. 11181229-01(004)
Title
**CONTROL BUILDING
MECHANICAL LAYOUT**

Sheet No.
M-02

1. GENERAL CLAUSES
- 1.1. GENERAL REQUIREMENTS, INSTRUCTIONS TO BIDDERS, SPECIFICATIONS AND DRAWINGS FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. UNLESS SPECIFICALLY NOTED OTHERWISE, WORK SHALL INCLUDE THE FURNISHING OF ALL LABOUR AND MATERIALS TO COMPLETE AND PUT INTO OPERATING CONDITION ALL ELECTRICAL AND INSTRUMENTATION AND CONTROL SYSTEMS AS INDICATED ON DRAWINGS AND SPECIFICATIONS HEREIN.

1.2. THESE SPECIFICATIONS AND DRAWINGS ARE TO BE READ TOGETHER WITH SPECIFICATIONS AND DRAWINGS OF ALL OTHER DIVISIONS. ADDITIONAL INFORMATION NECESSARY TO COMPLETE THE WORK IS INCLUDED IN OTHER SECTIONS OF DRAWINGS AND SPECIFICATIONS.

1.3. WORD "SUPPLY" SHALL MEAN THAT SO NOTED EQUIPMENT IS TO BE PURCHASED, ASSEMBLED, AND SHIPPED UNDAMAGED TO SITE. WHERE AN ITEM IS SUPPLIED BY THE OWNER, BY OTHERS OR BY ANOTHER DIVISION, THE WORK OF MOUNTING, CONNECTING AND COMMISSIONING THE ITEM SHALL BE INCLUDED IN THE CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE.

1.4. WORD "PROVIDE" SHALL MEAN THAT THE SO NOTED EQUIPMENT IS TO BE SUPPLIED, INSTALLED, CONNECTED, ADJUSTED, CALIBRATED, TUNED, CLEANED, COMMISSIONED, AND PLACED INTO FULL SERVICE.

1.5. WORD "INSTALL" SHALL MEAN TO PUT THE SPECIFIED ITEM INTO FULL OPERATION, SECURELY FASTENED AND CONNECTED TO THE SYSTEM. CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIAL WHICH IS NECESSARY TO SECURELY FASTEN AND GIVE A PRESENTABLE FINISHED APPEARANCE INCLUDING ALL NECESSARY CONNECTIONS AND CONDUCTORS. SUCH NOTED EQUIPMENT MUST BE FULLY CALIBRATED AND TESTED.

1.6. DRAWING PACKAGE AND SPECIFICATIONS COVERED HEREIN PROVIDE GENERAL DESIGN GUIDELINES. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL FOR ALL EQUIPMENT (INCLUDING PANELS) AND DESIGN PRIOR TO CONSTRUCTION.
2. SCOPE
- 2.1. PROVIDE ALL ITEMS, MATERIAL, EQUIPMENT AND LABORS AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM AS MENTIONED HEREIN, OR INDICATED ON DRAWINGS.

2.2. THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO:

2.2.1. PROVIDE A NEW VALVE CONTROLLER PANEL C/W A CLA-VAL VC-22D CONTROLLER, A GROUND BAR AND AN ISOLATED GROUND BAR.

2.2.2. PROVIDE A SOLENOID VALVE AND A FLOW ELEMENT C/W AN INDICATING TRANSMITTER.

2.2.3. RELOCATE, REINSTALL AND REWIRE THE EXISTING PRESSURE INDICATING TRANSMITTER AS SHOWN IN THE ELECTRICAL DRAWINGS.

2.2.4. PROVIDE ALL EQUIPMENT GROUNDING AND BONDING AS INDICATED IN THE ELECTRICAL DRAWINGS AS PER THE CANADAIAN ELECTRICAL CODE.

2.2.5. PROVIDE A NEW SCADAPACK 32 RTU MODULE IF THE EXISTING MODULE IN THE EXISTING ELECTRICAL CONTROL PANEL DOES NOT HAVE ENOUGH SPARE CAPACITY AS REQUIRED PER THE ELECTRICAL DRAWINGS. IF REQUIRED, THE NEW MODULE SHALL BE LOCATED INSIDE THE NEW VC-001 VALVE CONTROLLER PANEL. PROVIDE ALL INSTALLATION REQUIREMENTS, PROGRAMMING, WIRING, ETC.

2.2.6. PROVIDE ALL REQUIRED CABLE TIES, ATTACHMENT TAPE AND TAGS.

2.2.7. PROVIDE ALL REQUIRED CABLING AND CONNECTION OF ALL EQUIPMENT TO PANELS AS INDICATED ON DRAWINGS.

2.2.8. PROVIDE FIELD COMMISSIONING, ADJUSTMENT AND CERTIFIED MANUFACTURERS ACCEPTANCE REPORTS FOR ALL ELECTRICAL, INSTRUMENT AND CONTROL EQUIPMENT AND SYSTEMS.

2.2.9. PROVIDE THREE(3) HARD COPIES AND PDF FILE OF O&M MANUALS.

2.2.10. PROVIDE SHOP DRAWINGS FOR APPROVAL FOR ALL EQUIPMENT, INCLUDING THE VALVE CONTROLLER PANEL, VC-22D CONTROLLER, FLOW INDICATING TRANSMITTER, SOLENOID VALVE, ALL AUXILIARY SCADA, INSTRUMENT AND CONTROL DEVICES ETC.

2.2.11. CONTRACTOR SHALL BE FULLY QUALIFIED AND EQUIPPED TO CARRY OUT TESTING OF ALL ELECTRICAL, CONTROL AND POWER EQUIPMENT AND SYSTEMS OR AS AN ALTERNATIVE, SHALL PROVIDE THE SERVICES OF A QUALIFIED MANUFACTURER'S REPRESENTATIVE TO CARRY OUT TESTING.

2.2.12. PROVIDE ALL CABLING, WIREWAYS AND MATERIAL FOR POWER SUPPLY OF ALL EQUIPMENT.

2.2.13. CONTRACTOR SHALL PROVIDE ALL MODIFICATIONS AND INSTALLATIONS REQUIRED IN THE EXISTING CONTROL PANEL AS SHOWN IN ELECTRICAL DRAWINGS. THIS INCLUDES NEW TERMINALS, FUSES, WIRING, TAGS, ETC.

2.2.14. ELECTRICAL HEAT TRACING AS SHOWN IN DRAWINGS. WORK INCLUDES HEAT TRACE CONTROLLER, POWER KIT, END KIT, TRACER, RTD, AND ALL ASSOCIATED HARDWARE. SUPPLY AND INSTALL A BRANCH CIRCUIT BREAKER IN THE EXISTING POWER DISTRIBUTION PANEL AS SHOWN IN THE ELECTRICAL DRAWINGS.

3. DISCREPANCY
- 3.1. VIEW PLANS, VISIT SITE AND CHECK PLANS AGAINST EXISTING CONDITIONS. SHOULD ANY DISCREPANCY EXIST BETWEEN THE SPECIFICATION AND DRAWINGS FOR THE ACTUAL CONDITIONS ON JOB SITE, A RULING SHALL BE OBTAINED FROM THE ENGINEER BEFORE THE FINAL PRICE IS SUBMITTED.
4. CODE AND PERMITS
- 4.1. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL BUILDING BYLAW AND THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE, AS AMENDED AND ADAPTED BY THE LOCAL AUTHORITY. OBTAIN ALL NECESSARY PERMITS AND LICENSES AND PAY ALL FEES IN CONNECTIONS WITH THE WORK.
5. IDENTIFICATION
- 5.1. IDENTIFY ALL EQUIPMENT WITH STAINLESS STEEL NAME PLATES. IDENTIFY FEEDERS AND CIRCUIT WIRES AS PER CODE AND CONTRACT REQUIREMENTS.

5.2. PROVIDE STAINLESS STEEL NAME PLATE ON PANEL COVERS TO IDENTIFY VOLTAGE AND PANEL TAG. SUBMIT ALL NAMEPLATES AND TAGS FOR APPROVAL.
6. RECORD DRAWINGS (AS-BUILT)
- 6.1. OBTAIN A COPY OF CLEAN FULL SIZE DRAWING AND MAKE ALL AS BUILT CHANGES ON CLEAN DRAWING. PROVIDE A COPY OF AS BUILT DRAWINGS TO ENGINEER FOR RECORD FILES. SUBMIT ALL DRAWINGS TO PROJECT MANAGER UPON COMPLETION OF WORK.

6.2. SHOW ALL PULL BOXES, JUNCTION BOXES, SLEEVES AND CIRCUIT NUMBERS ON RECORD DRAWINGS.
7. VALVE CONTROLLER PANEL
- 7.1. THE WORK INCLUDES A VALVE CONTROLLER PANEL C/W ALL ASSOCIATED EQUIPMENT AS INDICATED ON DRAWINGS.

7.2. PANEL SHALL MEET THE FOLLOWING REQUIREMENTS:

7.2.1. PANEL SHALL BE THE GASKETED AND RATED NEMA 12.

7.2.2. PANEL SHALL BE WALL - MOUNT C/W MOUNTING BRACKETS.

7.2.3. ENCLOSURE SHALL COME WITH INNER DOOR MOUNTED EQUIPMENT SPECIFICATION AND DRAWING POCKETS.

7.2.4. ALL EQUIPMENT SHALL BE TAGGED USING STAINLESS STEEL LABELS WITH 10 mm HIGH BLACK CHARACTERS AND STAINLESS STEEL SCREWS.

7.2.5. CONTRACTOR SHALL SUPPLY AND INSTALL A CLA-VAL VC-22D CONTROLLER INSIDE THE PANEL.

7.2.6. PANEL SHALL BE OVERSIZED WITH AMPLE WORKING SPACE AROUND THE INTERNAL EQUIPMENT.

7.2.7. CONTRACTOR SHALL SUPPLY AND INSTALL OVERSIZED PANDUITS, TERMINAL BLOCKS, COPPER GROUND BAR AND ISOLATED COPPER GROUND BAR.
8. MISCELLANEOUS ELECTRICAL EQUIPMENT
- 8.1. SOLENOID VALVE

8.1.1. FOLLOW MECHANICAL DRAWINGS FOR MAKE / MODEL

8.1.2. SOLENOID RATING: 4-20mA, LOOP POWERED

8.2. MAGNETIC FLOW METER

8.2.1. SIZE DN200

8.2.2. PROCESS CONNECTION RATING CLASS 150

8.2.3. POWER SUPPLY: 24VDC

8.2.4. OUTPUT: 4-20mA

8.2.5. MECHANICAL PROTECTION: IP66

8.2.6. REMOTE - MOUNTED FLOW TRANSMITTER

8.2.7. DIGITAL LCD DISPLAY

8.2.8. LINING MATERIAL: POLYURETHANE

8.2.9. ELECTRODE MATERIAL: SS316

8.2.10. MANUFACTURER AND MODEL: CLA-VAL X144D E-FLOWMETER WITH INTEGRAL DISPLAY
9. GUARANTEE
- 9.1. WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF WORK, REPLACE OR REPAIR, AT OWN EXPENSE, ANY DEFECT IN MATERIAL, WORKMANSHIP OR INSTALLATION OR ANY CODE VIOLATIONS.
10. MATERIALS AND INSTALLATION
- 10.1. ALL MATERIALS SHALL BE NEW.

10.2. ALL MATERIALS SHALL BE INDUSTRIAL GRADE AND CSA APPROVED WITH CSA STAMP

10.3. PROVIDE SHOP DRAWINGS FOR ALL EQUIPMENT INSTALLED.

10.4. EXTEND ALL CONDUITS AND TECK CABLES TO ACCESSIBLE SPACE AS REQUIRED. DO NOT SPLICE CABLES.

11. GROUNDING
- 11.1. PROVIDE GROUNDING AS PER ELECTRICAL DRAWINGS AND CANADIAN ELECTRICAL CODE REQUIREMENTS.
12. SPECIFIC CLAUSES
- 12.1. CABLES AS LISTED IN DRAWINGS.

12.2. SUPPLY AND INSTALL POWER FEEDERS AND CONTROL WIRING TO ACHIEVE THE WIRING CONNECTION SHOWN ON DRAWINGS AND PROVIDE ALL CONNECTORS, JUNCTION BOXES, TECK CABLE CONNECTORS, CABLE SUPPORTS, CHANNEL TRAYS AND ALL ACCESSORIES AS REQUIRED.

12.3. PROVIDE IDENTIFICATION TAG WITH CABLE AND CIRCUIT NUMBER FOR FEEDERS, JUNCTION BOXES AND PANELS. USE P-TOUCH MACHINE TO LABEL WIRING DEVICES AND TERMINATIONS ASSEMBLIES.

12.4. EXACT ROUTING FOR ALL CABLES, CONDUITS AND FEEDERS TO BE CONFIRMED ONSITE TO SUIT SITE CONDITIONS.

12.5. APPROVED TECK 90 CONNECTORS SHALL BE UTILIZED.

12.6. CONTRACTOR SHALL HIRE A THIRD PARTY TO PROVIDE SCADA PROGRAMMING AND INTEGRATION INTO THE CITY OF WHITE ROCK'S SCADA SYSTEM AS PART OF CONTRACTORS SCOPE OF WORK. THIS THIRD PARTY MUST BE ON THE CITY OF WHITE ROCK'S APPROVED LIST OF SCADA SYSTEM VENDORS. CONSULT WITH THE CITY OF WHITE ROCK PRIOR TO PROCUREMENT OF EQUIPMENT/SERVICES.

CONTRACTOR SHALL PROVIDE ALL SCADA AND COMMUNICATION HARDWARE IN ACCORDANCE WITH THE CITY OF WHITE ROCK'S SPECIFICATIONS AND REQUIREMENTS FOR FULL INTEGRATION WITH THE CITY'S EXISTING SCADA SYSTEM. CONTRACTOR SHALL CONSULT WITH THE CITY OF WHITE ROCK PRIOR TO PROCUREMENT OF EQUIPMENT/SERVICES.
13. EQUIPMENT INSTALLATION
- 13.1. SUPPLY AND INSTALLATION OF PIPING AND EQUIPMENT ANCHORING BY CONTRACTOR.

13.2. MAINTAIN MINIMUM WORKING SPACE AROUND COMPONENTS ACCORDING TO MANUFACTURER'S RECOMMENDATION AND CEC.

13.3. CONTRACTOR SHALL COORDINATE AND CONDUCT, IN CONJUNCTION WITH ENGINEER AND OWNER, THE SITE ACCEPTANCE TESTING. THIS TESTING WILL CONSIST OF FUNCTIONAL AND OPERATIONAL TESTS AND COMMISSIONING OF THE OVERALL SYSTEM.

13.4. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DEMONSTRATION OF PROPER OPERATION OF EQUIPMENT. SHOULD SYSTEM FAIL TO MEET TEST REQUIREMENTS, MAKE NECESSARY REPAIRS WITH HELP / ASSISTANCE FROM EQUIPMENT SUPPLIER, AND REPEAT SITE TEST FOR AT LEAST 24 HOUR DURATION.

13.6. CONTRACTOR SHALL MAINTAIN SITE TEST RECORD LOG/SHEETS WHICH RECORD TEST CONDITIONS AND LOGGED DATA. RECORDING AND TEST RECORDING FORMAT SHALL BE SUPPLIED BY MANUFACTURER AND SHALL BE NEAT AND READILY LEGIBLE. PROVIDE TEST COPIES TO THE OWNER FOR INCLUSION IN INSTRUCTION MANUALS.
14. GENERAL
- 14.1. CLEAN UP AND REMOVE ALL UNUSED CABLE, WIRING AND CONDUITS.

14.2. CONFIRM EQUIPMENT LOCATIONS AND MOUNTING HEIGHT WITH ENGINEER PRIOR TO INSTALLATION.

14.3. FIRE PROOF ALL FIRE RATED PENETRATIONS AFTER INSTALLATION TO COMPLY WITH LOCAL FIRE CODES.



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Client
**CITY OF WHITE ROCK
BRITISH COLUMBIA**

Project
ROPER RESERVOIR INLET

3	ISSUED FOR TENDER	LG	CB	Jul. 23, 2019
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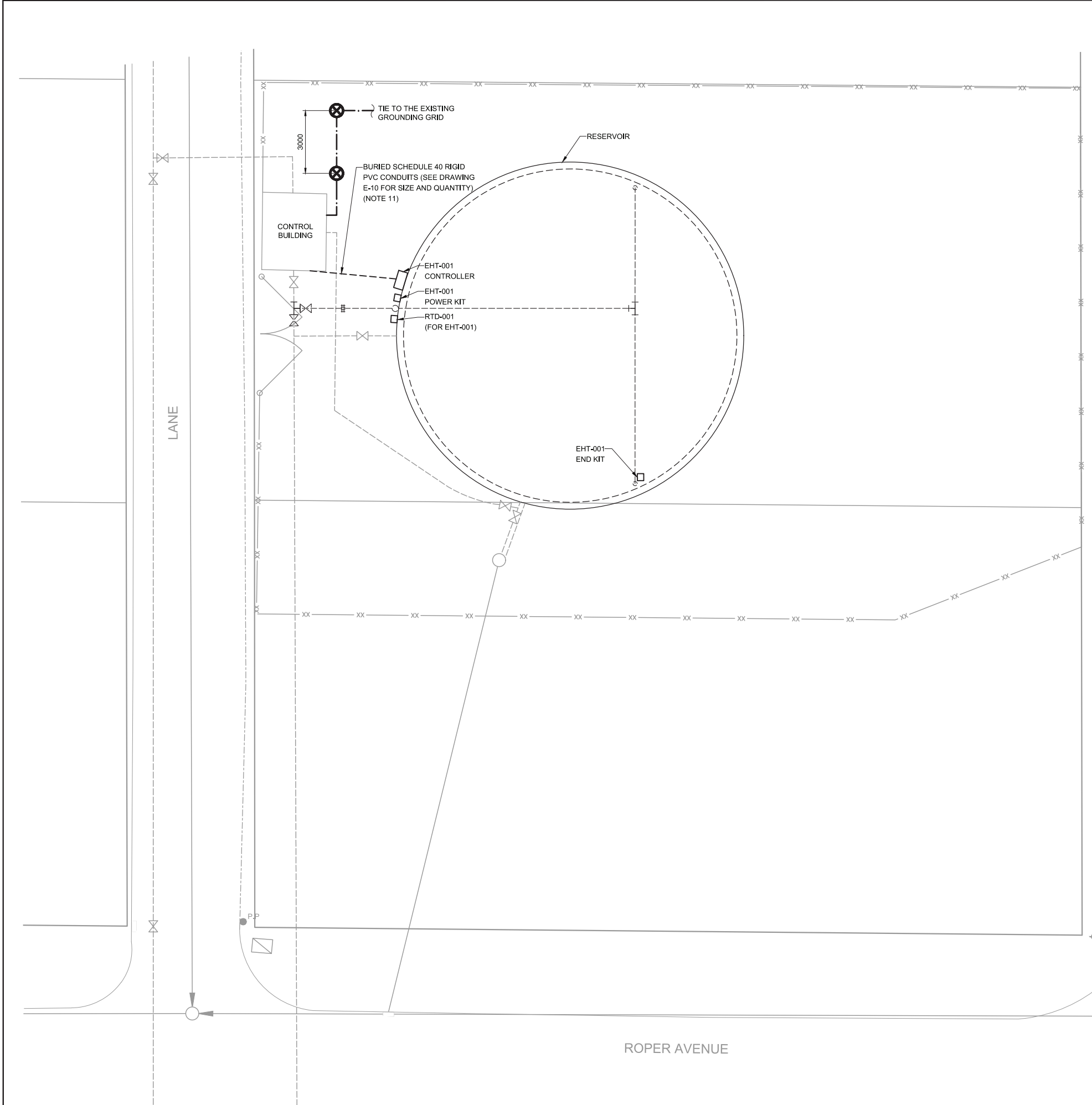
Drawn	D.MCDONALD	Designer	A.KHALILZADEH
Drafting Check	T.GERMSHEID	Design Check	A.PARSONS
Project Manager	C.BAECHLER	Date	July 23, 2019
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Project No. 11181229-01 (004)

Title
**ELECTRICAL
GENERAL NOTES**

Sheet No.

E-00



- LEGEND:**
- BURIED CABLE OR CABLES IN CONDUIT(S)
 - ⊗ GROUNDING WELL C/W A 6m LONG, 1" DIAMETER COPPER BONDED STEEL GROUND ROD AND WELL CAP
 - . - . - GROUNDING CONDUCTOR, 600mm BELOW FINISHED GRADE IN NATIVE SOIL
 - ▲ COMPRESSION CONNECTION: FOR BONDING GROUNDING CONDUCTOR TO GROUNDING CONDUCTOR
 - BOLTED CONNECTION: FOR BONDING EQUIPMENT TO GROUNDING CONDUCTOR
 - #2/0 AWG BARE COPPER CONDUCTOR: FOR GROUND GRID CONDUCTORS
 - #2/0 AWG GREEN COPPER CONDUCTOR: FOR CONNECTING CONTROL BUILDING GROUND BAR TO THE GROUND GRID
 - #2 AWG GREEN COPPER CONDUCTOR: FOR BONDING AND GROUNDING ALL EQUIPMENT RATED 600V AND BELOW

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LOCATIONS IN THE SCOPE OF WORK ARE NON-HAZARDOUS.
 - ELECTRICAL HEAT TRACE PANELS AND COMPONENTS ARE NOT DRAWN TO SCALE IN THIS DRAWING.
 - CONTRACTOR SHALL HEAT TRACE AND INSULATE ALL EXPOSED STAINLESS STEEL PIPE INCLUDING THE BURIED SECTION PORTION. FOR PIPING SECTION VIEWS SHOWING THE FULL SCOPE OF HEAT TRACING, SEE DRAWINGS P-01 AND C-03.
 - ALL PENETRATIONS INTO THE EXISTING CONTROL BUILDING SHALL BE WEATHERPROOF AND FIRE-STOP SEALED. ALL CONDUITS CARRYING CABLES OUTSIDE THE EXISTING CONTROL BUILDING SHALL BE SCHEDULE 40 RIGID PVC. ALL CONDUIT FITTINGS SHALL BE FACTORY BENT WITH 300mm BENDING RADIUS.
 - CONTRACTOR SHALL SUPPLY AND INSTALL TWO (2) 2-INCH SCHEDULE 40 RIGID PVC CONDUITS BETWEEN THE EXISTING CONTROL BUILDING AND THE EXISTING WATER RESERVOIR TO CARRY HEAT TRACE CABLES. SUPPLY AND INSTALL A THIRD 2-INCH SCHEDULE 40 RIGID PVC CONDUIT AS SPARE. CAP BOTH ENDS. EXTEND AND SUPPORT ALL CONDUITS 1000mm (MINIMUM) ABOVE FINISHED GRADE FOR MECHANICAL PROTECTION.
 - FOR EHT-001 ELECTRICAL HEAT TRACING STANDARD INSTALLATION DETAILS, SEE DRAWING E-21.
 - CONTRACTOR SHALL SUPPLY AND INSTALL ALL THE REQUIRED MOUNTING HARDWARE FOR THE ELECTRICAL HEAT TRACE SYSTEM. THE WORK INCLUDES MOUNTING EHT-001 CONTROLLER ON THE RESERVOIR WALL AT 3000mm ABOVE FINISHED GRADE USING UNISTRUTS. CONTRACTOR SHALL SUPPLY AND INSTALL A RIGID PROTECTIVE WIRE GUARD C/W A PADLOCKABLE DOOR FOR EHT-001 CONTROLLER.
 - CONTRACTOR SHALL MOUNT EHT-001 POWER KIT AND RTD-001 3000mm (MINIMUM) ABOVE FINISHED GRADE. CONTRACTOR SHAL SUPPLY AND INSTALL A RIGID PROTECTIVE WIRE GUARD FOR EHT-001 POWER KIT AND RTD-001.
 - CONTRACTOR SHALL RUN A #2AWG GREEN GROUND CONDUCTOR IN EACH PVC CONDUIT AND BOND TO THE COPPER GROUND BAR INSIDE THE CONTROL BUILDING. BOND AND GROUND EHT-001 CONTROLLER TO THE CONTROL BUILDING COPPER GROUND BAR. CONTRACTOR SHALL SUPPLY AND INSTALL A COPPER GROUND BAR IN THE CONTROL BUILDING. ALL EHT-001 COMPONENTS SHALL BE BONDED AND GROUNDED AS PER MANUFACTURER'S GUIDELINES.
 - FOR CONDUIT IN TRENCH DETAIL, CONTRACTOR SHALL FOLLOW MMCD STANDARD DETAIL DRAWING E3-2 FOR UNDERGROUND CONDUIT IN NON-PAVED AREAS.

- REFERENCE DRAWINGS:**
- E-02 CONTROL BUILDING ELECTRICAL EQUIPMENT LAYOUT
 - E-10 WIRING DIAGRAM
 - E-20 ELECTRICAL HEAT TRACING
 - E-21 ELECTRICAL HEAT TRACING STANDARD INSTALLATION DETAILS



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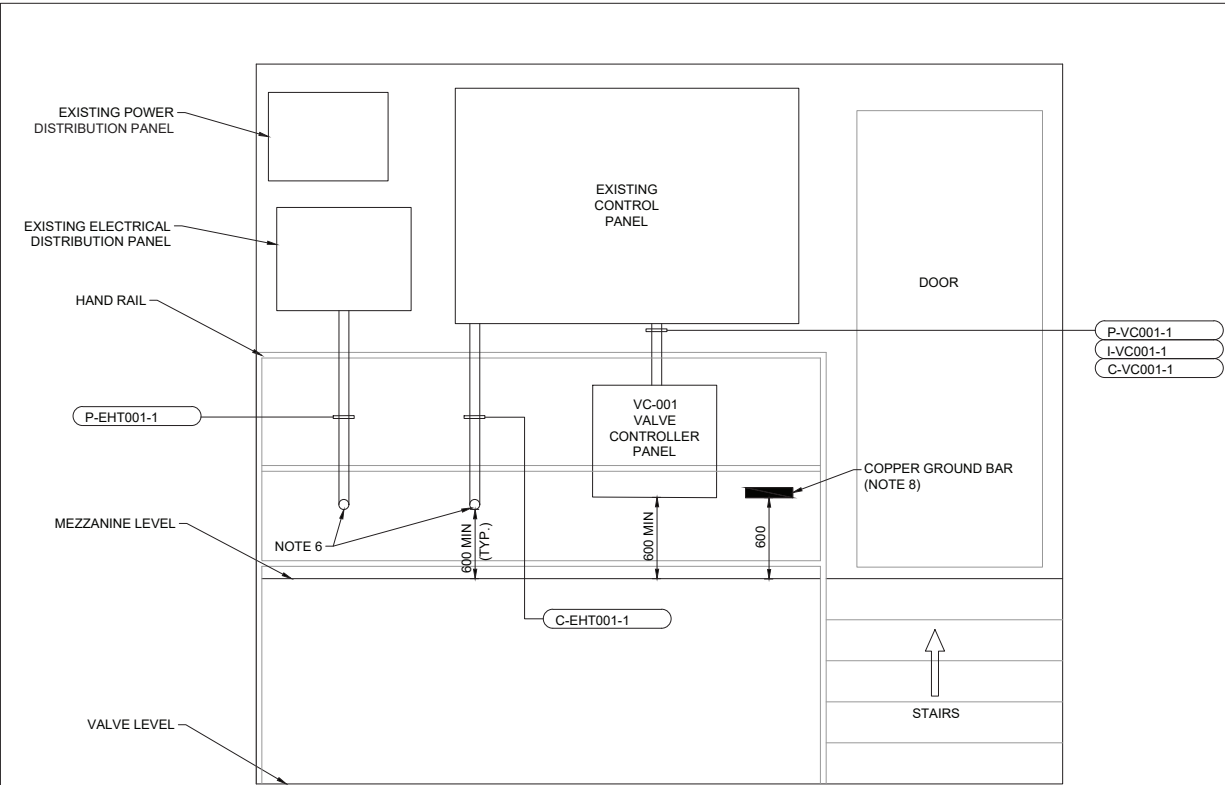
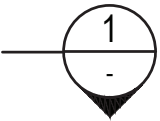
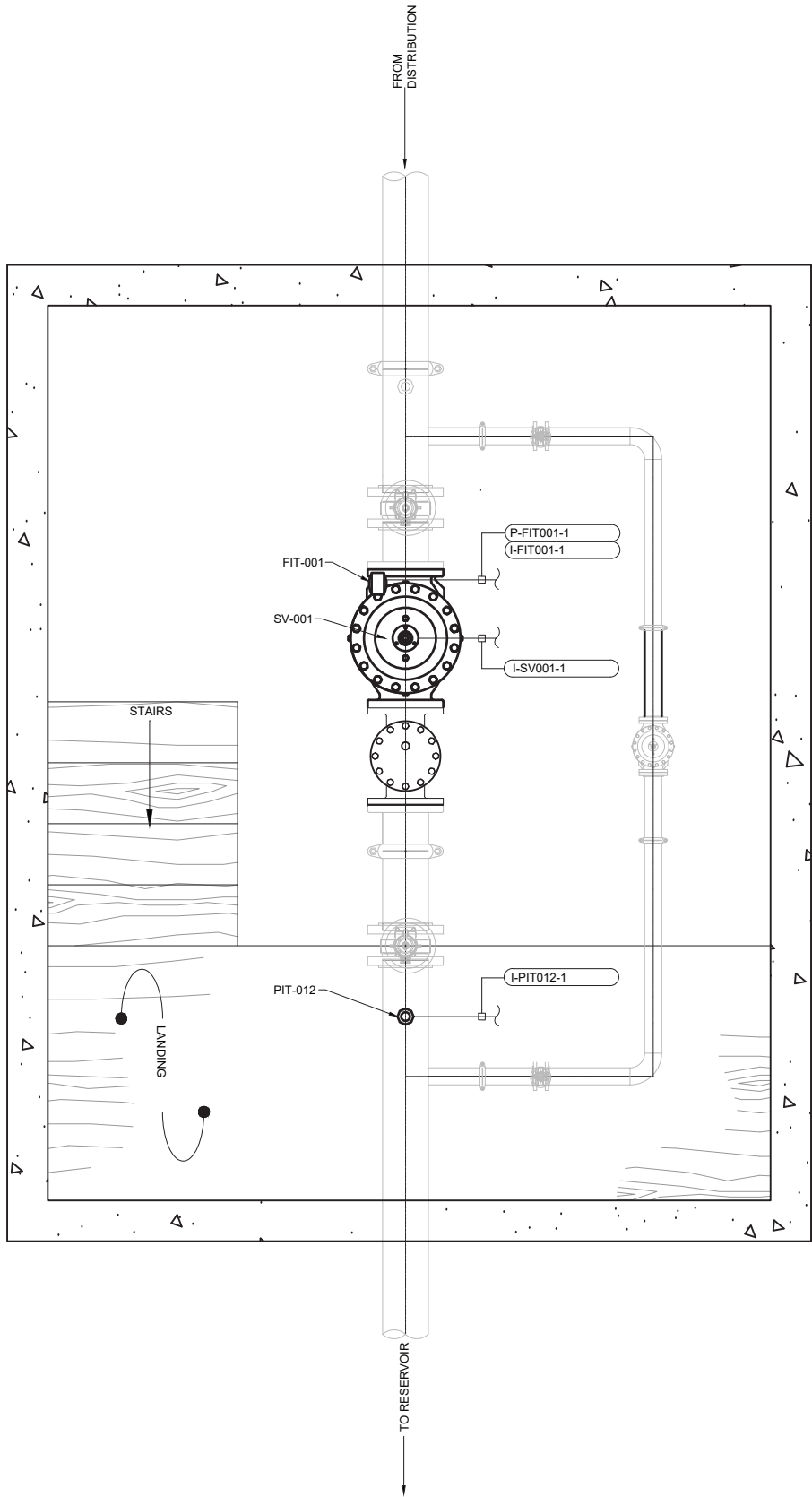
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Drafting Check	T.GERMSHEID	Design Check	A. PARSONS	
Project Manager	C.BAECHLER	Date	July 23, 2019	
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Project No. 11181229-01(004)

Title
**ELECTRICAL
SITE PLAN**

Sheet No.
E-01



DETAIL 1 ELEVATION VIEW
NTS

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 2. ELECTRICAL PANELS ARE NOT DRAWN TO SCALE.
 3. CONTRACTOR SHALL SUPPLY AND INSTALL VC-001 VALVE CONTROLLER PANEL. PANEL SHALL BE A WALL-MOUNT, GASKETED NEMA 12 ENCLOSURE C/W MOUNTING BRACKETS. SUPPLY AND INSTALL A CLA-VAL VC-22D CONTROLLER, GROUND BAR AND AN ISOLATED GROUND BAR C/W SCREW TYPE LUGS IN THIS PANEL.
 4. CONTRACTOR SHALL BOND THE GROUND BAR IN VC-001 PANEL TO THE COPPER GROUND BAR USING A #2AWG GREEN GROUND CONDUCTOR.
 5. CONTRACTOR SHALL BOND THE ISOLATED GROUND BAR IN VC-001 PANEL TO THE ISOLATED GROUND BAR IN THE EXISTING CONTROL PANEL USING A #2AWG GREEN GROUND CONDUCTOR.
 6. CONTRACTOR SHALL SUPPLY AND INSTALL FITTINGS AS REQUIRED TO TRANSITION TO BUILDING EXTERIOR WALL AND THEN BURIED UNDERGROUND TO EHT-001 CONTROLLER. STRAP CONDUITS TO WALL USING 2-HOLE STAINLESS STEEL STRAPS C/W STAINLESS STEEL SCREWS.
 7. FOR A COMPLETE LISTING OF CONDUITS (INCLUDING SIZE AND TYPE), SEE DRAWING E-10.
 8. CONTRACTOR SHALL SUPPLY AND INSTALL AN OVERSIZED BARE COPPER GROUND BAR C/W ALL GROUNDING LUGS AS REQUIRED. CONTRACTOR SHALL TIE THE GROUND BAR TO THE STATION GROUND GRID USING GREEN #2/0AWG COPPER GROUNDING CONDUCTOR.
 9. CONTRACTOR SHALL BOND ALL EXISTING ELECTRICAL PANELS TO THE COPPER GROUND BAR USING #2AWG GREEN COPPER GROUND CONDUCTOR.

- REFERENCE DRAWINGS:
1. E-01 ELECTRICAL SITE PLAN
 2. E-10 WIRING DIAGRAM
 3. E-20 ELECTRICAL HEAT TRACING



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Project
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Drafting Check	T.GERMSHEID	Design Check	A. PARSONS
Project Manager	C.BAECHLER	Date	Jul. 23, 19
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Project No. 11181229-01(004)

Title
**CONTROL BUILDING
ELECTRICAL EQUIPMENT LAYOUT**

Sheet No.

E-02




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Project No. 11181229-01(004)

Title
**ELECTRICAL
HEAT TRACING**

Sheet No.

E-20

- LEGEND:
- PANEL WIRING
 - FIELD WIRING
 - PANEL TERMINAL
 - FIELD DEVICE TERMINAL
 - PANEL DEVICE TERMINAL

NOTES:

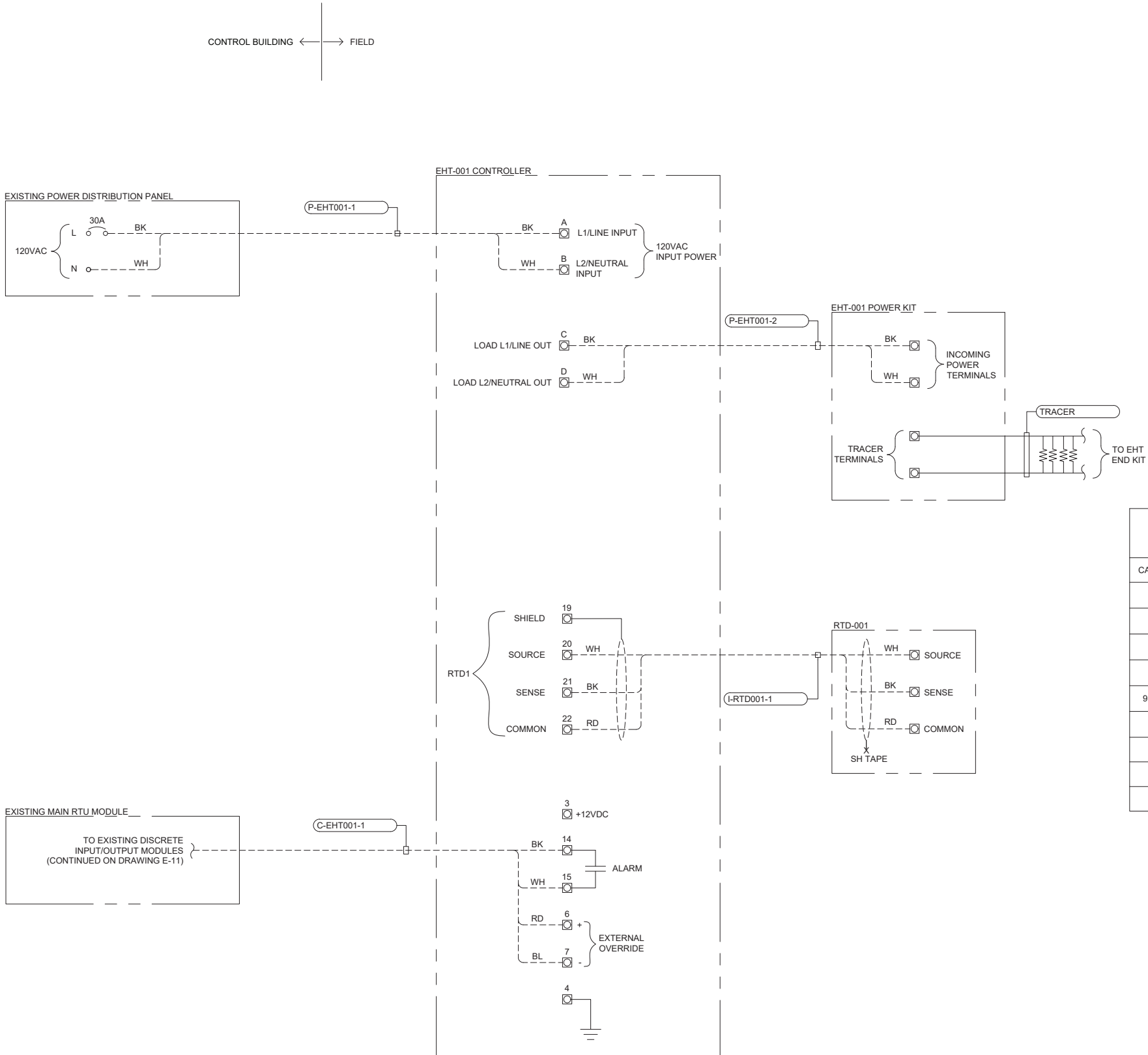
- CONTRACTOR SHALL SUPPLY AND INSTALL ONE (1) GFCI, 30A, 120VAC, 15kAIC IN THE EXISTING POWER DISTRIBUTION PANEL TO POWER THE HEAT TRACE CIRCUIT.
- CONTRACTOR SHALL PREPARE AND SUBMIT AN AS-BUILT POWER DISTRIBUTION PANEL SCHEDULE TO THE ENGINEER FOR APPROVAL PRIOR TO ADDING THE HEAT TRACE CIRCUIT.
- CONTRACTOR SHALL FOLLOW RAYCHEM INDUSTRIAL HEAT TRACING INSTALLATION AND MAINTENANCE MANUAL FOR THE HEAT TRACING SCOPE OF WORK.
- THE FOLLOWING DESIGN CRITERIA HAS BEEN USED FOR HEAT TRACE CALCULATIONS. CONTRACTOR SHALL VERIFY ALL DESIGN CRITERIA AND PROVIDE CALCULATION SHEET TO THE ENGINEER PRIOR TO PROCUREMENT AND INSTALL OF HEAT TRACE SYSTEM.
 - A. MAINTENANCE TEMPERATURE: 6C
 - B. MINIMUM AMBIENT TEMPERATURE: -18C
 - C. PIPE MATERIAL/SIZE: STAINLESS STEEL/150MM
 - D. THERMAL INSULATION: 25MM FIBERGLASS
- SEE DRAWING E-10 FOR CABLE AND CONDUIT SCHEDULE.
- ALL WIRING TERMINATIONS SHALL BE ON TERMINAL BLOCKS. NO SPLICING IS PERMITTED.

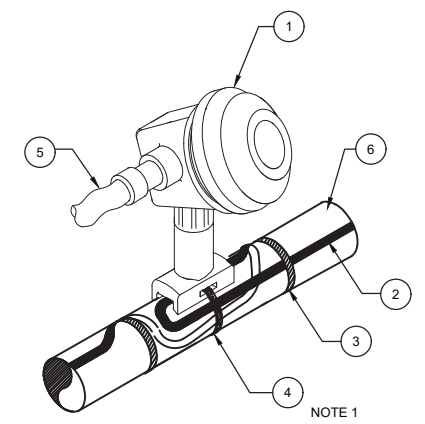
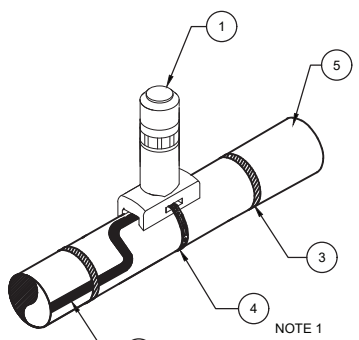
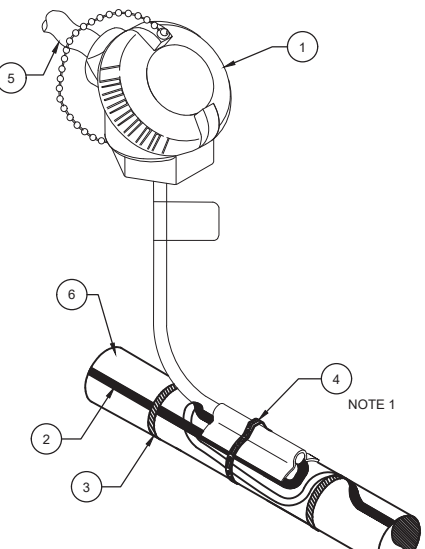
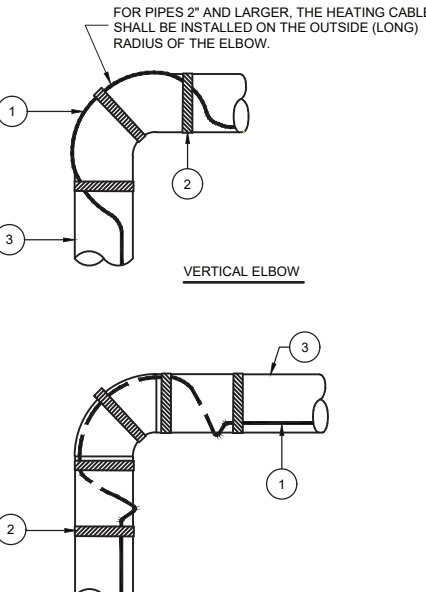
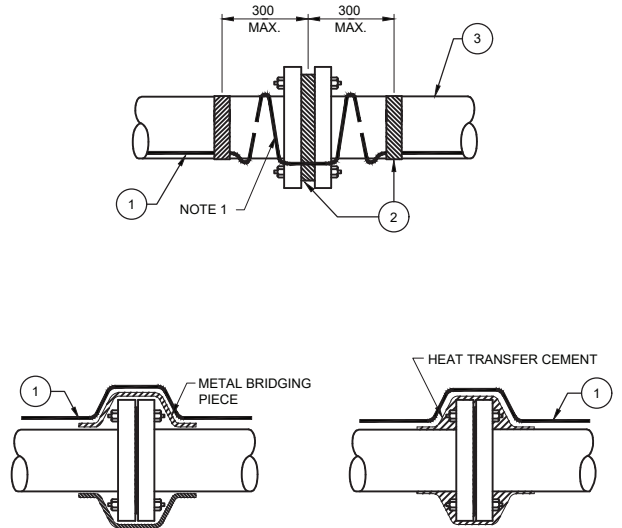
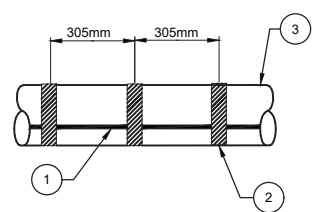
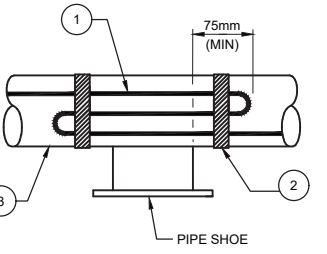
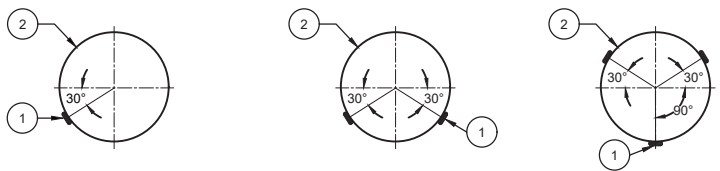
REFERENCE DRAWINGS:


- E-01 ELECTRICAL SITE PLAN
- E-02 CONTROL BUILDING ELECTRICAL EQUIPMENT LAYOUT
- E-10 WIRING DIAGRAM
- E-11 MAIN RTU MODULE WIRING DIAGRAM
- E-21 ELECTRICAL HEAT TRACING STANDARD INSTALLATION DETAILS

HEAT TRACING SCHEDULE

CATALOG NUMBER	DESCRIPTION	QUANTITY	COMMENTS
10BTV1-CT	10 Watt/ft, 120V RAYCHEM SELF-REG HEATING CABLE	150 ft	CONTRACTOR TO FIELD VERIFY AND ORDER TO LENGTH
E-100-L-A	RAYCHEM ABOVE-INSULATION END SEAL KIT C/W LED	1 EACH	
JBS-100-A	RAYCHEM SINGLE-ENTRY POWER KIT WITH JUNCTION BOX	1 EACH	
T-100	RAYCHEM TEE CONNECTION KIT	0 EACH	NOT REQUIRED
910"E1FWL"SSR2	RAYCHEM 910 CONTROLLER	1 EACH	
RTD4AL	RAYCHEM RTD	1 EACH	
ETL-ENGLISH	ELECTRIC TRACED LABEL	AS REQUIRED	
GS-54	GLASS TAPE	AS REQUIRED	
PS-10	PIPE STRAP	AS REQUIRED	



 <p>NOTE:</p> <ol style="list-style-type: none">DO NOT PLACE STRAP OVER CABLE.INSTALL 3000mm (MINIMUM) ABOVE FINISHED GRADE C/W A RIGID PROTECTIVE WIRE GUARD. <p>DETAIL 01 EHT POWER KIT / TEE CONNECTION NTS</p>			 <p>NOTE:</p> <ol style="list-style-type: none">DO NOT PLACE STRAP OVER CABLE. <p>DETAIL 02 EHT END KIT / SPLICE KIT NTS</p>			 <p>NOTE:</p> <ol style="list-style-type: none">DO NOT PLACE STRAP OVER CABLE.INSTALL 3000mm (MINIMUM) ABOVE FINISHED GRADE C/W A RIGID PROTECTIVE WIRE GUARD. <p>DETAIL 03 EHT RTD INSTALLATION NTS</p>			<p>FOR PIPES 2" AND LARGER, THE HEATING CABLE SHALL BE INSTALLED ON THE OUTSIDE (LONG) RADIUS OF THE ELBOW.</p>  <p>DETAIL 04 EHT CABLE INSTALLATION AT PIPE ELBOW 1 RUN NTS</p>			 <p>NOTE:</p> <ol style="list-style-type: none">ON SMALL FLANGES OR JOINTS, IN ORDER TO AVOID CABLE BEING EMBEDDED IN INSULATION, INSTALL EITHER NON-RUSTING METAL BRIDGING PIECES ACROSS FLANGES TO SUPPORT CABLE OR HEAT TRANSFER CEMENT TO FILL GAP BETWEEN CABLE AND FLANGE. <p>DETAIL 05 EHT CABLE INSTALLATION ON FLANGE NTS</p>		
6	-	PIPE	5	-	PIPE	6	-	PIPE	3	-	PIPE	3	-	PIPE
5	AS REQ'D	FEEDER CABLE AS PER CABLE SCHEDULE	5	AS REQ'D	INSTRUMENT CABLE AS PER CABLE SCHEDULE	5	AS REQ'D	FEEDER CABLE AS PER CABLE SCHEDULE	2	AS REQ'D	GLASS TAPE	2	AS REQ'D	GLASS TAPE
4	1	S.S. PIPE STRAP	4	1	S.S. PIPE STRAP	4	1	S.S. PIPE STRAP	1	AS REQ'D	SELF-REGULATING HEATING CABLE	1	AS REQ'D	SELF-REGULATING HEATING CABLE
3	AS REQ'D	GLASS TAPE	3	AS REQ'D	GLASS TAPE	3	AS REQ'D	GLASS TAPE						
2	AS REQ'D	SELF-REGULATING HEATING CABLE	2	AS REQ'D	SELF-REGULATING HEATING CABLE	2	AS REQ'D	SELF-REGULATING HEATING CABLE						
1	1	EHT POWER KIT OR TEE CONNECTION	1	1	EHT END KIT C/W LED	1	1	EHT RTD						
ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION
 <p>DETAIL 06 EHT CABLE INSTALLATION ON PIPE 1 RUN NTS</p>			 <p>DETAIL 07 EHT CABLE INSTALLATION AT PIPE SUPPORT LOCATIONS NTS</p>			 <p>DETAIL 08 EHT CABLE LOCATIONS NTS</p>								
3	-	PIPE	3	-	PIPE	2	-	PIPE						
2	AS REQ'D	GLASS TAPE	2	AS REQ'D	GLASS TAPE	1	-	SELF-REGULATING HEATING CABLE						
1	AS REQ'D	SELF-REGULATING HEATING CABLE	1	AS REQ'D	SELF-REGULATING HEATING CABLE									
ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION	ITEM No.	QTY	MATERIAL DESCRIPTION						



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Project
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2	ISSUED FOR TENDER	LG	CB	Jul. 23, 19
1	ISSUED OR 95% REVIEW	LG	CB	Mar. 29, 19
No.	Issue	Drawn	Approved	Date
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Drafting Check	T.GERMSHEID	Design Check	A. PARSONS	
Project Manager	C.BAECHLER	Date	Jul. 23, 19	
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Original Size		Bar is 20mm on original size drawing 0 20mm		
Project No.		11181229-01(004)		
Title		ELECTRICAL HEAT TRACING STANDARD INSTALLATION DETAILS		
Sheet No.		E-21		
		Sheet 7 of 7		

City of White Rock Everall PRV Station

CONTRACT No. WR19-009

ISSUED FOR TENDER



LOCATION PLAN
N.T.S.

DRAWING INDEX	
SHEET #	TITLE
C-01	CIVIL SPECIFICATIONS
C-02	SITE PLAN AND NEW BLOW-OFF SITE PLAN, EVERALL ST AND THRIFT AVE
C-03	SITE PLAN, PRV CHAMBER, EVERALL ST AND 16 AVE
C-04	CIVIL CONSTRUCTION DETAILS
P-01	PRV CHAMBER PROCESS AND INSTRUMENTATION DIAGRAM
M-01	MECHANICAL SPECIFICATIONS
M-02	PRV CHAMBER MECHANICAL LAYOUT
M-03	HATCH AND LADDER DETAILS
E-01	ELECTRICAL SITE PLAN
E-02	PRV CHAMBER ELECTRICAL LAYOUT
E-05	CP-001 CONTROL PANEL LAYOUT AND BILL OF MATERIALS
E-10	POWER DISTRIBUTION DIAGRAM
E-11	MOV-001 VALVE ACTUATOR WIRING DIAGRAM
E-12	CP-001 CONTROL PANEL SCHEMATIC DIAGRAM
E-13	CP-001 CONTROL PANEL MAIN RTU MODULE WIRING



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PROJECT No. 11181229-02(004)
July 2019

CIVIL SPECIFICATIONS

GENERAL

- ALL REFERENCES TO MASTER MUNICIPAL CONSTRUCTION DOCUMENTS ASSOCIATION (MMCD) MASTER MUNICIPAL SPECIFICATIONS ARE REFERRING TO PLATINUM ADDITION PRINTED 2009.
- PROJECT IDENTIFICATION AND PUBLIC NOTIFICATION OF CONSTRUCTION ACTIVITIES AND SCHEDULE IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 01 58 01.
- SITE SECURITY IS THE RESPONSIBILITY OF THE CONTRACTOR.
- DUST CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 31 15 60.
- SHRUB AND TREE PRESERVATION IS THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN SECTION 31 11 41.
- ENVIRONMENTAL PROTECTION OF THE WORK SITE IS THE RESPONSIBLY OF THE CONTRACTOR. THE CONTRACTOR SHALL FOLLOW ALL REASONABLE STEPS TO MITIGATE HARM TO THE ENVIRONMENT AS OUTLINED IN MMCD SECTION 01 57 01.
- TEMPORARY ACCESS ROADS, PARKING AREAS AND TRAFFIC CONTROL MEASURES ARE THE RESPONSIBILITY OF THE CONTRACTOR AS OUTLINED IN MMCD SECTION 01 55 00.

WATERWORKS

- ALL WATERWORKS TO CONFORM TO MMCD, MASTER MUNICIPAL SPECIFICATIONS, WATERWORKS SECTION 33 11 01, UNLESS OTHERWISE NOTED.
- WATERMAIN SIZES 100 mm THROUGH 300 mm SHALL CONFORM TO AWWA C900 AND SHALL HAVE A DIMENSION RATIO (DR) OF 18, UNLESS OTHERWISE NOTED.
- PVC WATERMAIN MATERIAL USED TO CONVEY POTABLE WATER MUST BE BLUE IN COLOR.
- ALL MATERIAL MUST BE NEW.
- GASKET MATERIAL AND JOINT LUBRICANTS MUST BE CERTIFIED FOR POTABLE WATER USE.
- FLANGED FITTINGS AND CONNECTIONS ARE ONLY TO BE USED ON THE BRANCH SIDE OF THE PIPES AT TEES WYES, ELBOWS, ETC.
- ALL FLANGED JOINTS TO CONFORM TO MMCD SPECIFICATION SECTION 33 11 01.
- ONLY FLANGES OF THE SAME TYPE TO BE MATED.
- REQUIRED TESTING FROM CONTRACTORS TO BE BY 3RD PARTY TESTING COMPANY OR OBSERVED BY CITY WATER STAFF PRIOR TO THE CITY ACCEPTING AND TIE-IN TO THE EXISTING WATER UTILITY DISTRIBUTION SYSTEM.
 - PRESSURE TEST TO MMCD 33 11 01 PAGE 20, 3.19.3, OR AWWA M23 & C605 STANDARD AND OBSERVED BY CITY WATER OPERATOR OR THIRD PARTY CONTRACTOR.
 - DISINFECTION TO AWWA STANDARDS. UNITS TO BE IN PPM WITH RESIDUALS AFTER 24 HOURS.
 - FRASER HEALTH CONSTRUCTION PERMIT FOR NEW WATERMAIN CONSTRUCTION.
 - MICRO BIOLOGICAL TEST TO AWWA STANDARD, 2 TESTS 24 HOURS APART (TOTAL CHLOROFORM & COLI COUNT)
 - PROVIDE MICRO BIOLOGICAL TEST FOR EACH TIE-IN POINT AND ENDS OF THE INSTALLED WATERMAIN.
 - PROVIDE MICRO BIOLOGICAL TEST FOR EACH SERVICE CONNECTION.
 - THE CONTRACTOR IS TO CONTACT SIMON PITHER, LEAD WATER OPERATOR, AT 604-880-4220, TO CONFIRM THEIR TIE-IN PROCEDURE AND WORKS AT THE START OF THE PROJECT.
- DIRECT BURY GATE VALVES SHALL BE USED FOR PIPES 100 mm TO 1200 mm DIAMETER IN SIZE.
- GATE VALVES SHALL CONFORM TO AWWA C500, C509, OR C515; NO RISING STEM.
- ALL EXTERNAL NUTS AND BOLTS TO BE TYPE 304 STAINLESS STEEL OR BETTER.
- PROVIDE CATHODIC PROTECTION FOR STEEL, CAST AND DUCTILE IRON PIPE, CAST IRON FITTINGS, VALVES, HYDRANTS, COPPER SERVICES AND WHEREVER ELSE SHOWN ON THE DRAWINGS.
- CATHODIC PROTECTION SHALL BE IN ACCORDANCE WITH THE LOCAL MUNICIPAL GUIDELINES OR AS SPECIFIED BY THE ENGINEER.
- COUPLINGS AND FLANGED COUPLING ADAPTERS ARE TO CONFORM TO MMCD SPECIFICATIONS, SECTION 33 11 01, ITEM 2.2.12.
- VALVES ARE TO CONFORM TO MMCD SPECIFICATIONS, SECTION 33 11 01, ITEM 2.3.
- WATERMAINS TO BE RESTRAINED INSTEAD OF USING CONCRETE THRUST BLOCKS. THIS IS DUE TO LIMITED SPACE REQUIREMENTS FOR ALL UNDERGROUND UTILITIES IN ROADWAY. HORIZONTAL AND VERTICAL DEFLECTIONS TO USE EBAA WEDGE ACTION RESTRAINTS.

EXECUTION

- GENERAL EXECUTION OF WATERMAINS, VALVES, CONNECTIONS, FITTINGS AND COUPLINGS AND THEIR APPURTENANCES INCLUDE MATERIAL PREPARATION, TRENCHING, BACKFILL AND BEDDING MATERIAL, PIPE INSTALLATION, JOINT RESTRAINTS AND CORROSION PROTECTION.
- CLEAN PIPES, FITTINGS, VALVES, HYDRANTS, AND APPURTENANCES OF DEBRIS AND WATER BEFORE INSTALLATION. CAREFULLY INSPECT MATERIALS FOR DEFECTS BEFORE INSTALLING. REMOVE DEFECTIVE MATERIALS FROM SITE.
- DO TRENCHING TO CONFORM TO THE MMCD SPECIFICATIONS, SECTION 31 23 01 - EXCAVATING, TRENCHING AND BACKFILLING.
- TRENCH ALIGNMENT AND DEPTH AS SHOWN ON THE CONTRACT DRAWINGS.
- TRENCH DEPTH TO PROVIDE COVER OVER PIPE OF NOT LESS THAN 1.0 m FROM FINISHED GRADE UNLESS SHOWN OTHERWISE IN THE CONTRACT DRAWINGS.

GRANULAR BEDDING

- FOR GRANULAR BEDDING, FILL OVER-EXCAVATION BELOW DESIGN ELEVATION OF BOTTOM OF SPECIFIED BEDDING WITH GRANULAR BEDDING PLACED AND COMPACTED IN ACCORDANCE WITH 3.5.2 AND 3.5.5 OF MMCD SPECIFICATIONS, SECTION 33 11 01. DRAIN ROCK MAY BE USED FOR BACKFILL OF OVER-EXCAVATION WITH CONTRACT ADMINISTRATOR'S APPROVAL.
- PLACE GRANULAR BEDDING MATERIAL ACROSS FULL WIDTH OF TRENCH BOTTOM IN UNIFORM LAYERS. WHERE PIPE BEDDING MATERIALS REQUIRE COMPACTION TO MEET DENSITY REQUIREMENTS, IT SHALL BE ACHIEVED BY MEANS OF HAND COMPACTION IN 150mm LIFTS TO THE DEPTHS SHOWN ON THE UTILITY TRENCH DETAIL, WITH FINAL DENSITIES CONFIRMED BY GEOTECHNICAL TESTING AND DOCUMENTATION.
- SHAPE BED TRUE TO GRADE TO PROVIDE CONTINUOUS UNIFORM BEARING SURFACE FOR PIPE. DO NOT USE BLOCKS WHEN BEDDING PIPE.
- SHAPE TRANSVERSE DEPRESSIONS IN BEDDING AS REQUIRED TO SUIT JOINTS.
- COMPACT EACH LAYER FULL WIDTH OF BED TO MINIMUM 95% MODIFIED PROCTOR DENSITY IN COMPLIANCE WITH ASTM D1557. CONTRACTOR TO INCLUDE COST OF 3RD PARTY INSPECTION SERVICES FOR COMPACTION TESTING.
- PLACE WATERMAIN PIPE AND WATER SERVICE TUBING ON PREPARED FLAT BOTTOMED TRENCH FREE OF ROCK, BACKFILL WITH APPROVED NATIVE OR IMPORTED MATERIAL AND COMPACT IN ACCORDANCE WITH MMCD - G4 SHOWN ON C-04. USE HAND TOOLS TO COMPACT MATERIAL UNDER HAUNCH AREA OF PIPE AND AROUND FITTINGS AND OTHER MATERIALS.
- USE IMPORTED BEDDING MATERIAL WHEN NATIVE MATERIAL IS DEEMED UNSUITABLE FOR BACKFILL BY CONTRACT ADMINISTRATOR OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK.
- USE IMPORTED BEDDING WHEN PROPOSED WORK IS INSTALLED THROUGH PAVED AREAS, WHEN NATIVE MATERIAL IS DEEMED UNSUITABLE FOR BACKFILL BY CONTRACT ADMINISTRATOR OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK.

PIPE INSTALLATION

- HANDLE PIPE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DO NOT USE CHAINS OR CABLES PASSED THROUGH PIPE BORE SO THAT WEIGHT OF PIPE BEARS ON PIPE ENDS.
- LAY AND JOIN PIPES TO MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS EXCEPT AS NOTED OTHERWISE HEREIN. PVC PIPE TO AWWA M23 AND AWWA C605; DUCTILE IRON PIPE TO AWWA C600.
- ADDITIONALLY FOLLOW SPECIFICATIONS AS LAID OUT IN MMCD SECTION 33 11 01, 3.6 PIPE INSTALLATION.

VALVE INSTALLATION

- INSTALL VALVES TO MANUFACTURER'S RECOMMENDATIONS AT LOCATIONS SHOWN ON CONTRACT DRAWINGS AND AS SPECIFIED IN MMCD SECTION 33 11 01, 3.7-VALVE INSTALLATION.
- VALVES TO BE INSTALLED IN VERTICAL POSITION WITH ACTUATING STEM PLUMB.

JOINT RESTRAINT DEVICES

- JOINT RESTRAINT DEVICES TO BE USED AT ALL VALVES, TEES, CROSSES, PLUGS, CAPS, BENDS, CHANGES IN PIPE DIAMETER, REDUCERS, HYDRANTS AND FITTINGS AS SPECIFIED IN MMCD SECTION 33 11 01, 2.2.4.13 AND AS SHOWN ON JOINT RESTRAINT DETAIL.

CORROSION PROTECTION

- WHERE SPECIFIED, PROVIDE CORROSION PROTECTION MEASURES AS PER SECTION 26 42 13 - CATHODIC PROTECTION OF THE MMCD SPECIFICATIONS.

PIPE SURROUND

- UPON COMPLETION OF PIPE LAYING AND AFTER CONTRACT ADMINISTRATOR HAS INSPECTED WORK IN PLACE, SURROUND AND COVER PIPES AS SHOWN ON STANDARD DETAIL DESIGN DRAWING G4.
- PLACE PIPE SURROUND BEDDING MATERIAL IN UNIFORM LAYERS SIMULTANEOUSLY ON BOTH SIDES OF PIPE. DO NOT DUMP MATERIAL WITHIN 1 m OF EXPOSED PIPE.
- COMPACT EACH LAYER FROM PIPE INVERT TO UNDERSIDE OF BACKFILL TO MINIMUM 95% MODIFIED PROCTOR DENSITY.

GENERAL PROCEDURE - FLUSHING, TESTING AND DISINFECTION

- ALL CLEANING, FLUSHING, PRESSURE AND LEAKAGE TESTING, DISINFECTION AND FINAL FLUSHING TO BE DONE BY CONTRACTOR.
- PERFORM ALL TESTS IN PRESENCE OF CONTRACT ADMINISTRATOR. NOTIFY CONTRACT ADMINISTRATOR 24 HOURS IN ADVANCE OF PROPOSED TEST.
- OBTAIN MUNICIPAL APPROVAL PRIOR TO DISCHARGING FLUSHING WATER TO MUNICIPAL SEWERS OR DRAINAGE DITCHES.
- COMPLY WITH MMCD GENERAL CONDITIONS CLAUSE 20.4, ENVIRONMENTAL LAWS, IN REGARD TO DISCHARGING FLUSHING WATER.
- PROVIDE CONTRACT ADMINISTRATOR WITH ALL REQUIRED APPROVALS PRIOR TO DISCHARGING FLUSHING WATER.
- CLEANING AND PRELIMINARY FLUSHING TO BE PERFORMED IN ACCORDANCE TO 3.18 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.
- UPON COMPLETION OF CONSTRUCTION OF ANY SECTION, WHICH SHALL BE DEFINED AS THAT PIPELINE AND APPURTENANCES LOCATED BETWEEN ANY TWO ADJACENT LINE VALVES, MAKE SECTION READY FOR TESTING. CARRY OUT TESTING IN ACCORDANCE WITH 3.19 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.
- AFTER CONTRACT ADMINISTRATOR HAS CERTIFIED THAT PIPES AND APPURTENANCES HAVE PASSED ALL SPECIFIED TESTS, FLUSH AND DISINFECT PIPES AND APPURTENANCES.
- DISINFECT AND FLUSH IN ACCORDANCE WITH 3.21 OF SECTION 33 11 01 OF THE MMCD SPECIFICATIONS.

CONNECTIONS TO EXISTING MAINS

- CONTRACTOR TO MAKE ALL NECESSARY ARRANGEMENTS WITH OWNER OF WATERWORKS SYSTEMS AND CONTRACT ADMINISTRATOR TO SCHEDULE WORK FOR CONNECTION TO EXISTING WATERWORKS SYSTEM. TO ENSURE NO DISRUPTION IN SERVICE TO CUSTOMERS, RESIDENTS OR BUILDINGS, USE VALVE INSERT, HOT TAP OR LINE STOP FOR CUT-IN.

EXCAVATING, TRENCHING AND BACKFILLING

- REFERS TO THOSE PORTIONS OF THE WORK THAT ARE UNIQUE TO EXCAVATING, TRENCHING AND BACKFILLING OF UNDERGROUND UTILITY INSTALLATIONS AND RELATED STRUCTURES.

MATERIALS

- REFER TO SECTION 31 05 17 - AGGREGATES AND GRANULAR MATERIALS IN THE MMCD SPECIFICATIONS FOR APPROVED GRANULAR MATERIALS AND APPROVED NATIVE MATERIAL.
- OTHER GRANULAR MATERIALS: GRANULAR MATERIALS APPROVED FOR ROADWORK (SUBBASE, BASE) ARE ALSO ACCEPTABLE FOR TRENCH BACKFILL SUBJECT TO APPROVAL OF CONTRACTOR ADMINISTRATOR.
- CONCRETE: TO SECTION 03 30 53 - CAST-IN-PLACE CONCRETE, OF THE MMCD SPECIFICATIONS TO BE MINIMUM 20 MPa.
- CONTROLLED DENSITY FILL: TO SECTION 31 23 23 - CONTROLLED DENSITY FILL OF THE MMCD SPECIFICATIONS, TO BE MAXIMUM 0.5 MPa.

SITE PREPARATION AND STOCKPILING

- REMOVE ALL BRUSH, WEEDS, GRASSES AND ACCUMULATED DEBRIS TO AN APPROVED OFFSITE LOCATION.
- CUT PAVEMENT OR SIDEWALK NEATLY ALONG LIMITS OF PROPOSED EXCAVATION AS SHOWN ON STANDARD DETAIL DRAWING G4 IN ORDER THAT SURFACE MAY BREAK EVENLY AND CLEANLY. CUT BEYOND LIMITS SHOWN ONLY IF AUTHORIZED BY CONTRACT ADMINISTRATOR.
- WHERE TRENCH PASSES THROUGH LAWN, NEATLY CUT AND REMOVE SOD BEFORE TRENCH EXCAVATION. SAVE SOD FOR REPLACEMENT UPON BACKFILLING TRENCH.
- STRIP TOPSOIL AFTER AREA HAS BEEN CLEARED AND STOCKPILE IN LOCATIONS AS SHOWN ON CONTRACT DRAWINGS OR DESIGNATED BY MUNICIPALITY. STOCKPILE HEIGHT NOT TO EXCEED 2 m, AVOID MIXING TOPSOIL WITH SUBSOIL. DISPOSE OF UNUSED TOPSOIL AS SPECIFIED. DO NOT HANDLE TOPSOIL WHILE IN WET OR FROZEN CONDITION OR IN ANY MANNER IN WHICH SOIL STRUCTURE IS ADVERSELY AFFECTED.
- STOCKPILE FILL MATERIALS IN AREAS DESIGNATED BY CONTRACT ADMINISTRATOR. STOCKPILE GRANULAR MATERIALS IN MANNER TO PREVENT SEGREGATION.

EXCAVATION AND PIPE INSTALLATION

- EXCAVATE TRENCHES TO ALLOW PIPE TO BE LAID TO ALIGNMENT AND THE GRADES REQUIRED WITH ALLOWANCE FOR SPECIFIED PIPE BEDDING, EXCAVATING, TRENCHING AND BACKFILLING.
- EXCAVATION TO BE PERFORMED TO 3.3 - EXCAVATION, OF SECTION 31 23 01, EXCAVATING, TRENCHING AND BACKFILL, OF THE MMCD SPECIFICATIONS.
- PIPE INSTALLATION TO BE PERFORMED TO 3.4, PIPE INSTALLATION, OF SECTION 31 23 01, EXCAVATING, TRENCHING AND BACKFILL, OF THE MMCD SPECIFICATIONS. INSTALL PIPE PER MMCD G4. FINAL PAVEMENT LIFT PER MMCD G9

BACKFILL AND COMPACTION

- PLACE AND COMPACT BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 31 23 01 - EXCAVATION, TRENCHING AND BACKFILLING.
- BACKFILL REQUIREMENTS, INCLUDING TYPE OF MATERIAL AND COMPACTION REQUIREMENTS AS SHOWN ON CONTRACT DRAWINGS, INCLUDING STANDARD DETAIL DRAWING G4.
- PLACE BACKFILL CAREFULLY IN TRENCH TO PREVENT DAMAGE TO INSTALLED PIPE.
- DURING BACKFILL AND COMPACTION OF TRENCH, REMOVE SHORING IN SUCH A MANNER AS TO ALLOW PROPER COMPACTION AND TO PREVENT TRENCH WALLS FROM COLLAPSING. REMOVE ALL BRACING AND/OR SHORING FROM TRENCH.
- FOR BACKFILL MATERIALS AND DIRECTIONS FOLLOW 3.5.3. BACKFILL MATERIALS, OF SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- PLACE BACKFILL AND COMPACT TO FOLLOWING MODIFIED PROCTOR DENSITIES IN COMPLIANCE WITH ASTM D1557.
- BOULEVARDS AND EASEMENTS TO 90% MIN.
- ROADS, DRIVEWAYS, SHOULDERS, RE-SHAPED DITCHES AND SIDEWALKS COMPACT TO 95% MIN.
- USE CAUTION IN PIPE ZONE TO ENSURE NO DAMAGE TO PIPE.

SURFACE RESTORATION

- RESTORE ALL DISTURBED SURFACES TO CONDITION AT LEAST EQUAL TO THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
- REPAIR ANY DAMAGE TO ADJACENT LANDS OR IMPROVEMENTS.
- RESOLVE ALL REASONABLE CLAIMS ARISING FROM CONTRACTOR'S ACTIONS AND OBTAIN WRITTEN RELEASES FROM LAND OWNERS FOLLOWING FINAL RESTORATION.
- RESTORE BOULEVARDS AND EASEMENTS IN ACCORDANCE WITH 3.6.2 - BOULEVARDS AND EASEMENTS, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- RESTORE GRAVELED ROADS AND DRIVEWAYS IN ACCORDANCE WITH 3.6.3 - GRAVELED ROADS AND DRIVEWAYS, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- RESTORE DITCHES IN ACCORDANCE WITH 3.6.4 - DITCHES, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- BASE PREPARATION FOR PAVED SURFACES IN ACCORDANCE WITH 3.6.5 - BASE PREPARATION FOR PAVED SURFACES, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- TEMPORARY PAVEMENT PATCHING IN ACCORDANCE WITH 3.6.6 - TEMPORARY PAVEMENT PATCHING, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.
- PERMANENT PAVEMENT RESTORATION IN ACCORDANCE WITH 3.6.7 - PERMANENT PAVEMENT RESTORATION, SECTION 31 23 01 OF THE MMCD SPECIFICATIONS.

VALVE CHAMBER

- 3512 TOP CHAMBER C/W BLACK EXTERIOR, WHITE INTERIOR, ELECTRICAL CONDUIT, LADDER, PIPE STANDS, ALUMINUM HATCH, GALVANIZED STEEL SUMP GRATE AND PIPES AND FITTINGS. MANUFACTURER - COAST WATER SYSTEMS 1-604-460-3622 OR APPROVED EQUAL. THE PRECAST SUPPLIER IS RESPONSIBLE TO DESIGN THE CHAMBER FOR BUOYANCY ASSUMING HIGH WATER LEVEL AT THE SURFACE.



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BRITISH COLUMBIA

Project

EVERALL PRV STATION

3	ISSUED FOR TENDER	DJW	CB	July 22, 19
2	FOR FINAL REVIEW	DJW	CB	May 23, 19
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No.	Issue	Drawn	Approved	Date

Drawn	S.BRIGGS	Designer	D.HOFSTETTER
Drafting Check	T.GERMSHEID	Design Check	C. BAECHLER
Project Manager	C. BAECHLER	Date	Mar. 29, 2019
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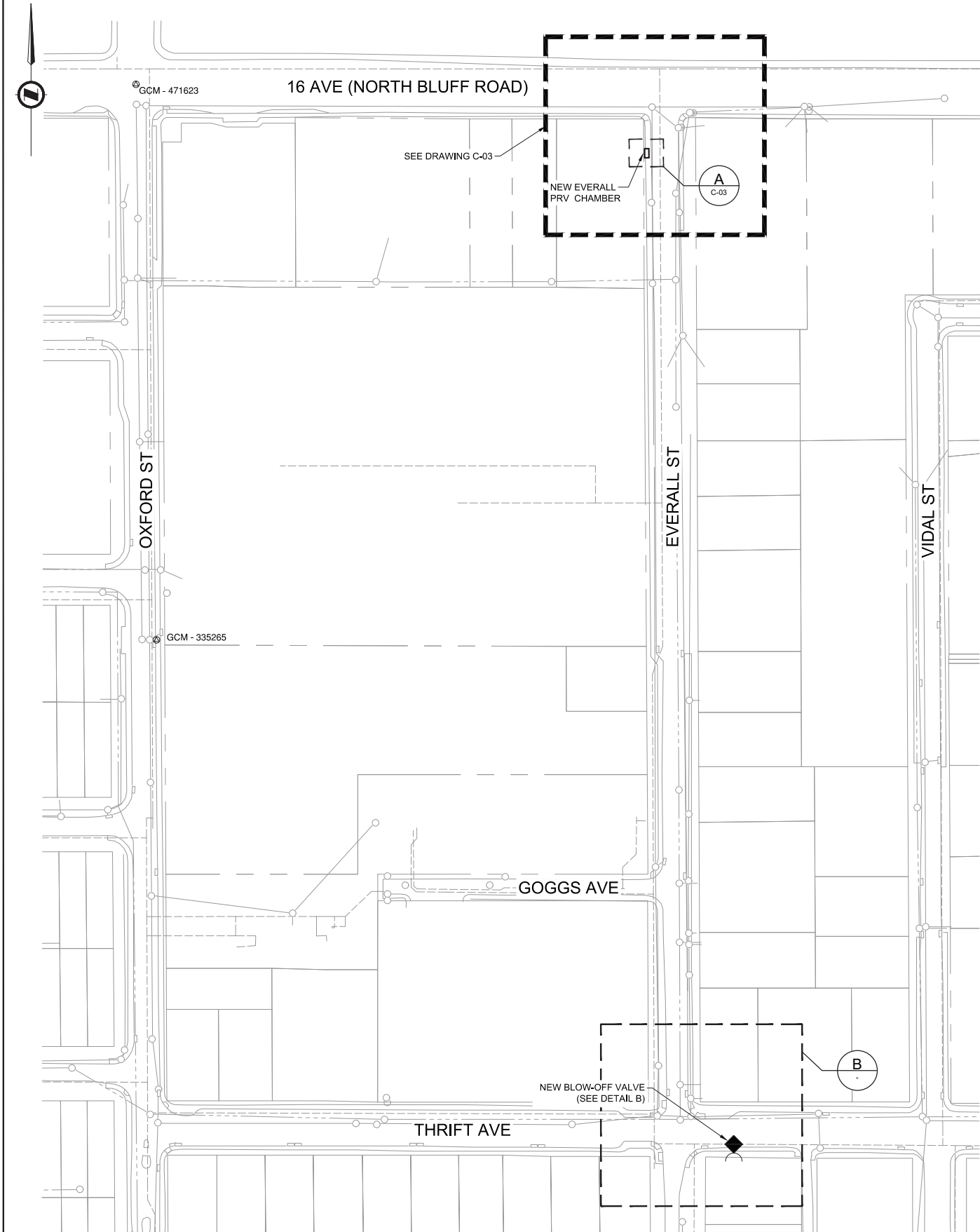
Project No. 11181229-02(004)

Title

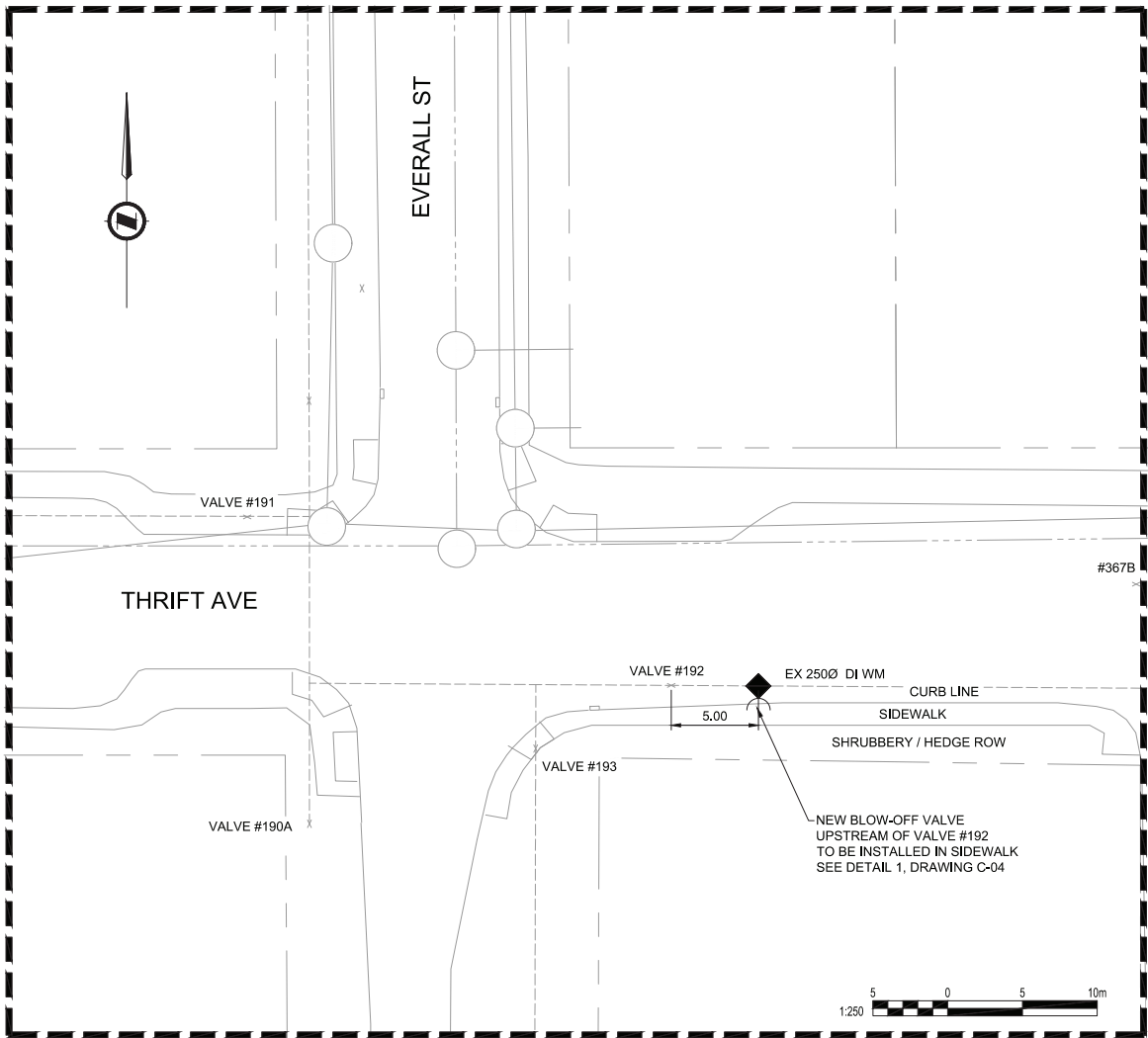
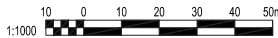
CIVIL
SPECIFICATIONS

Sheet No.

C-01



SITE PLAN



NEW BLOW-OFF SITE PLAN

1:250

GENERAL NOTES

1. DIMENSIONS ON DRAWINGS ARE IN METERS UNLESS OTHERWISE NOTED.
2. PIPE SIZES ARE SHOWN IN NOMINAL mm SIZES.
3. ALL EXISTING UTILITIES MUST BE INDEPENDENTLY VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND OTHER SITE SPECIFIC FEATURES THAT ARE REQUIRED TO REMAIN INTACT DURING THE COURSE OF CONSTRUCTION.
5. PLACE JOINT RESTRAINT DEVICE AT THE BLOW-OFF CONNECTIONS TO WATERMAIN, SEE DETAIL ON DRAWING C-04.

BLOW-OFF INSTALLATION NOTES

1. ALL FIELD ROUTING TO VERIFIED WITH ENGINEER PRIOR TO EXECUTION.
2. BLOW-OFF VALVE TO BE FIELD FIT BY THE CONTRACTOR.

1. FIBRE OPTIC AND ROGERS COMMUNICATION CABLES ARE KNOWN TO BE IN THE VICINITY OF THE SIDEWALK. CONTRACTOR TO VERIFY UTILITY LOCATIONS PRIOR TO PERFORMING WORK.

CONTROL POINTS

TABLET MARKING	NAME	NORTHING	EASTING	ELEVATION
5471	GCM - 471623	5430936.019	513727.242	95.934
5472	GCM - 208850	5430934.713	514232.381	108.654
88H3862	GCM - 335265	5430726.384	513734.978	88.724



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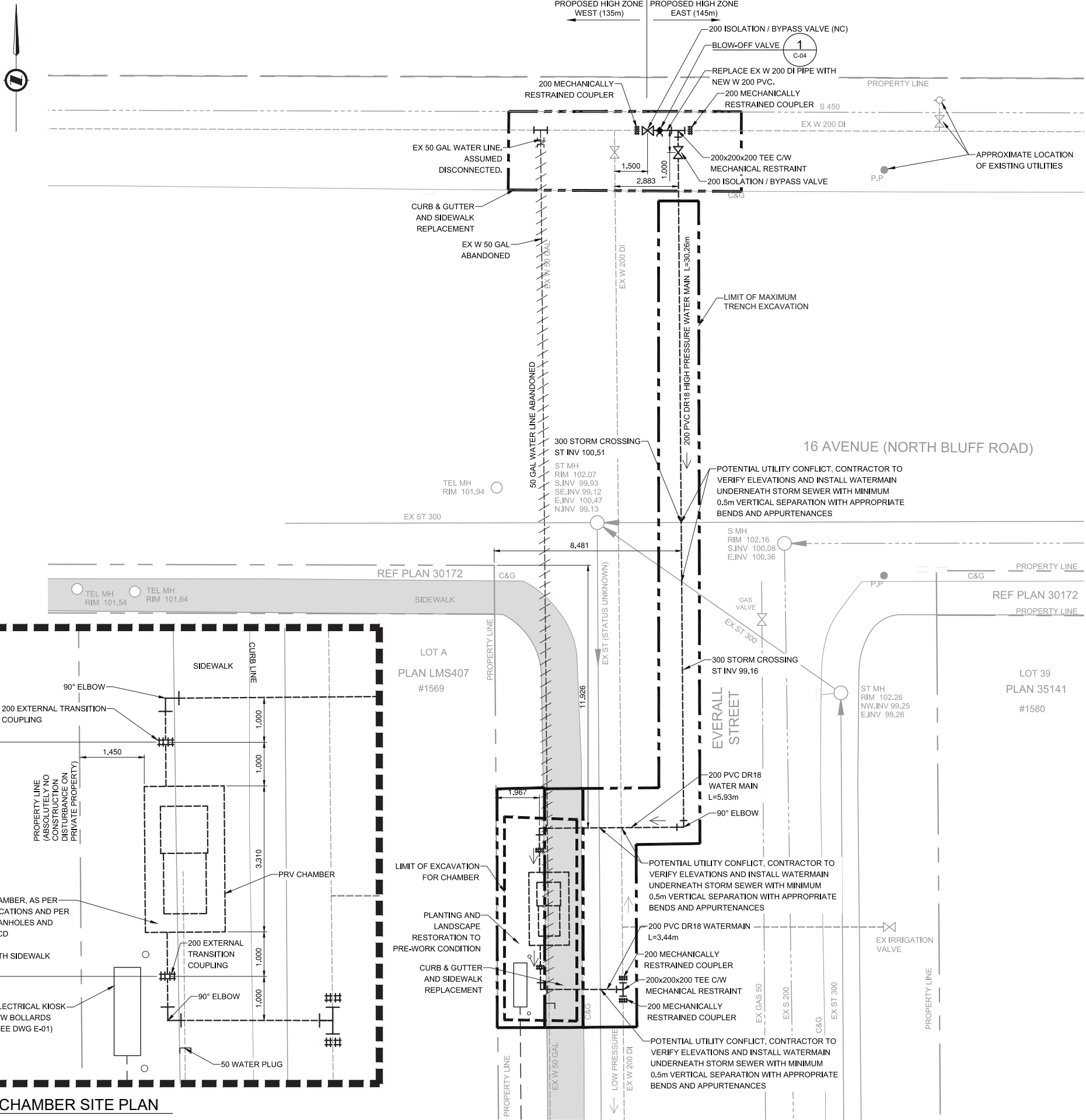
Project No. 11181229-02(004)

Title

SITE PLAN
NEW BLOW-OFF SITE PLAN
EVERALL ST AND THRIFT AVE

Sheet No.

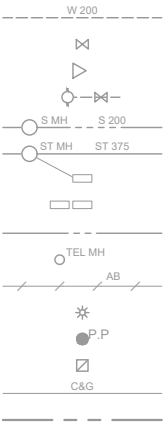
C-02



LEGEND

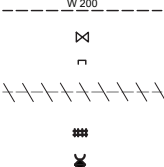
EXISTING CONDITIONS

WATER MAIN
WATER VALVE
WATER REDUCER/INCREASER
HYDRANT
SANITARY MANHOLE
STORM MANHOLE
CATCH BASIN & LEAD
TWIN CATCH BASIN
GAS
TELECOMMUNICATION MANHOLE
ABANDONED UTILITY
LIGHT STANDARD
POWER POLE
UTILITY PEDESTAL
CURB AND GUTTER
PROPERTY LINE
LOT LINE
GAL
DI



PROPOSED WORKS

WATER MAIN
WATER VALVE
WATER PLUG
ABANDON / REMOVE WATER MAIN
ROBAR COUPLING
WATER BLOW-OFF VALVE



GENERAL NOTES

- DIMENSIONS ON DRAWINGS ARE IN METERS UNLESS OTHERWISE NOTED.
- PIPE SIZES ARE SHOWN IN NOMINAL mm SIZES.
- ALL EXISTING UTILITIES MUST BE INDEPENDENTLY VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION.
- ALL UTILITIES BEING CROSSED NEED TO BE EXPOSED, CROSSING LOCATION PLANNED AND BE APPROVED BY CONTRACT ADMINISTRATOR, PRIOR TO CONSTRUCTING THE CROSSING.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND OTHER SITE SPECIFIC FEATURES THAT ARE REQUIRED TO REMAIN INTACT DURING THE COURSE OF CONSTRUCTION.
- WATER MAINS TO BE CONSTRUCTED WITH A MINIMUM OF 1.0m COVER.
- WHERE NEW WATER MAIN WILL CROSS UNDER EXISTING SEWER LINE, THE MINIMUM CLEARANCE FROM SEWER INVERT TO WATER MAIN OVERTOP IS 0.50m.
- PLACE JOINT RESTRAINT DEVICE AT ALL VALVES, TEES, PLUGS, CAPS, BENDS, CHANGES IN PIPE SIZE, REDUCERS, HYDRANTS AND FITTINGS. SEE DETAIL ON DRAWING C-04.
- EXACT LOCATION OF VAULT AND ELECTRICAL KIOSK TO BE DETERMINED IN THE FIELD AND APPROVED BY ENGINEER PRIOR TO CONSTRUCTION. ALL PIPE LENGTHS ARE APPROXIMATE AND SUBJECT TO CHANGE WITH VAULT AND ELECTRICAL KIOSK LOCATION.



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Client

CITY OF WHITE ROCK
BRITISH COLUMBIA

Project

EVERALL PRV STATION

3	ISSUED FOR TENDER	DJW	CB	July 22, 19
2	FOR FINAL REVIEW	DJW	CB	May 23, 19
1	ISSUED FOR 95% REVIEW	DJW	CB	Mar. 29, 19
No.	Issue	Drawn	Approved	Date

Drawn	S.BRIGGS	Designer	D.HOFSTETTER
Drafting Check	T.GERMSHEID	Design Check	C. BAECHLER
Project Manager	C. BAECHLER	Date	Mar. 29, 2019
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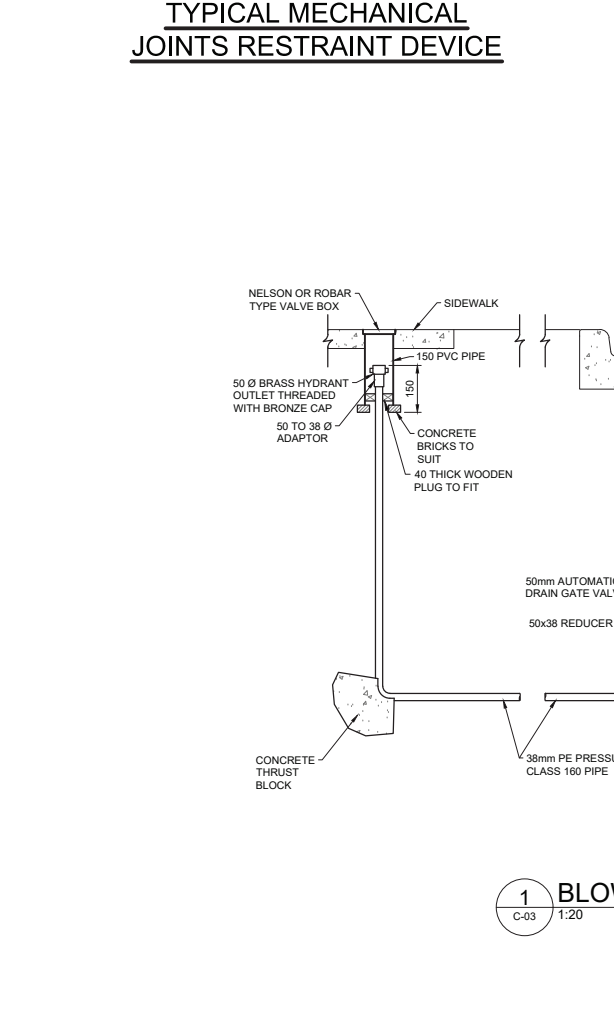
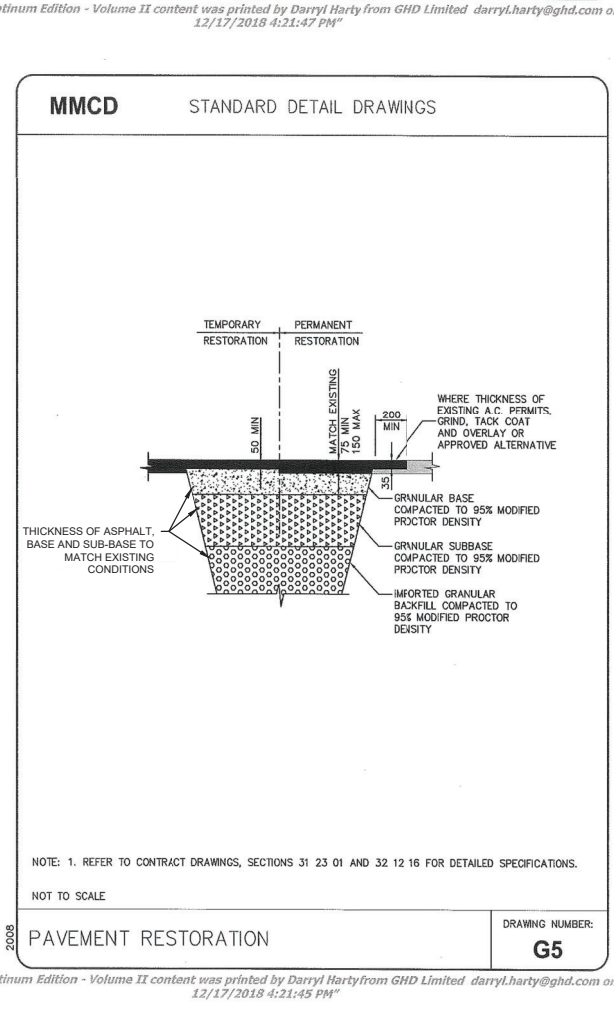
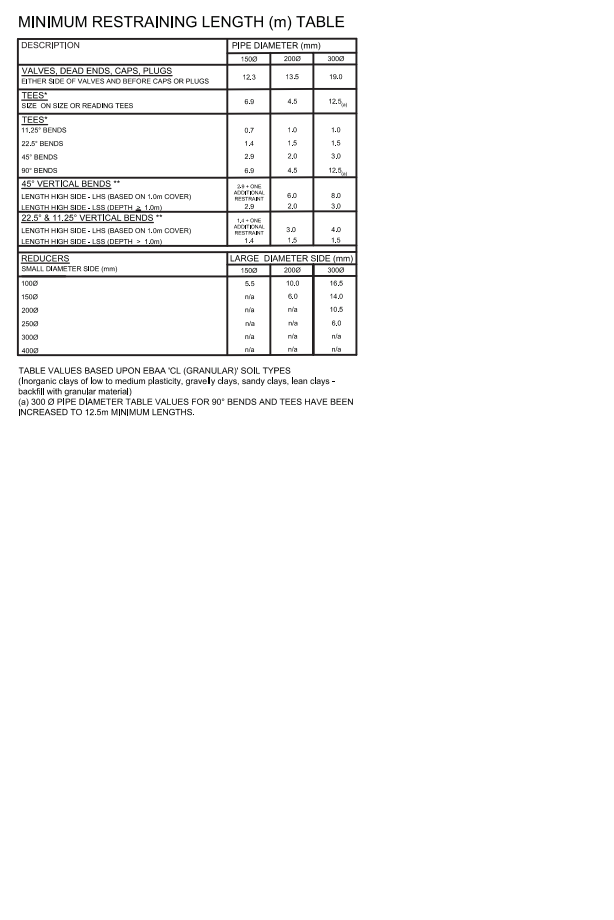
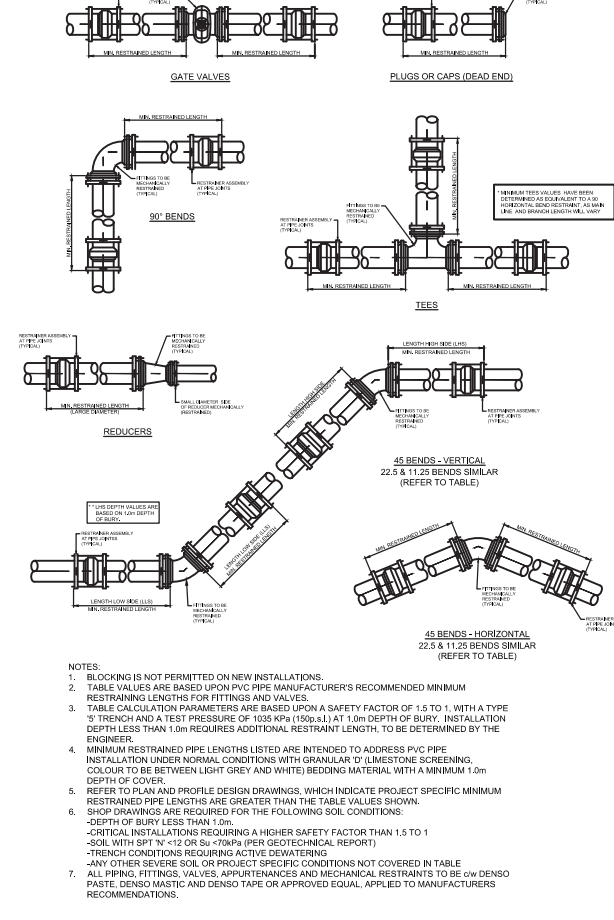
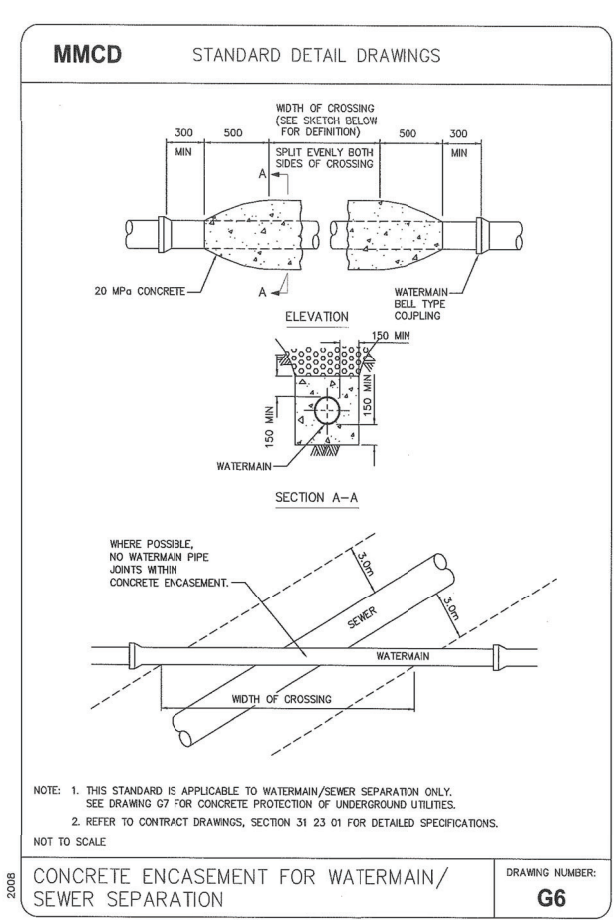
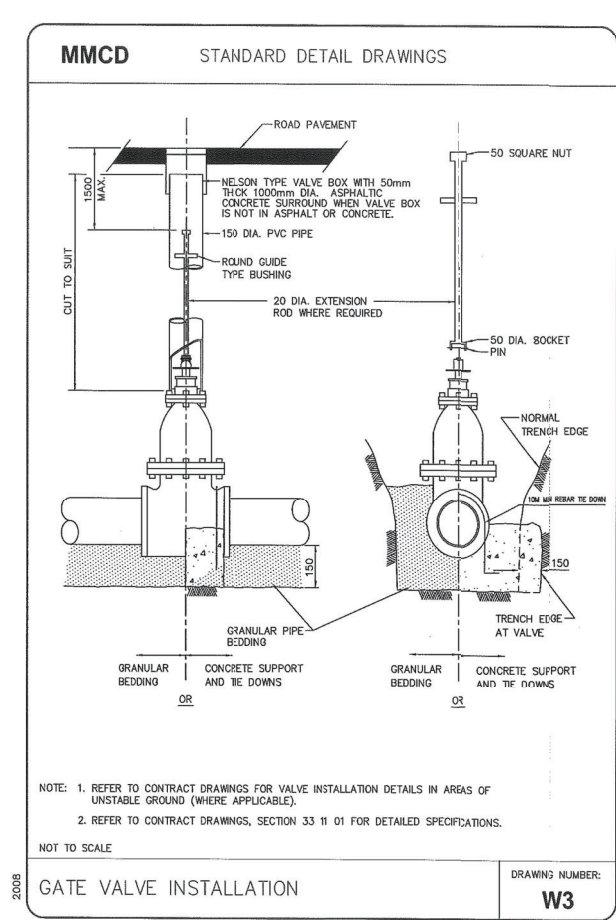
Project No. 11181229-02(004)

Title

SITE PLAN
PRV STATION
EVERALL ST AND 16 AVE

Sheet No.

C-03



Client: **CITY OF WHITE ROCK BRITISH COLUMBIA**

Project: **EVERALL PRV STATION**

No.	Issue	Drawn	Approved	Date
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Drawn: **S.BRIGGS** Designer: **D.HOFSTETTER**

Drafting Check: **T.GERMSHEID** Design Check: **C.BAECHLER**

Project Manager: **C.BAECHLER** Date: **Mar. 29, 2019**

Original Size: **ANSI D** Scale: **AS SHOWN**

Project No.: **11181229-02(004)**

Title: **CIVIL CONSTRUCTION DETAILS**

Sheet No.: **C-04**

Sheet 4 of 4



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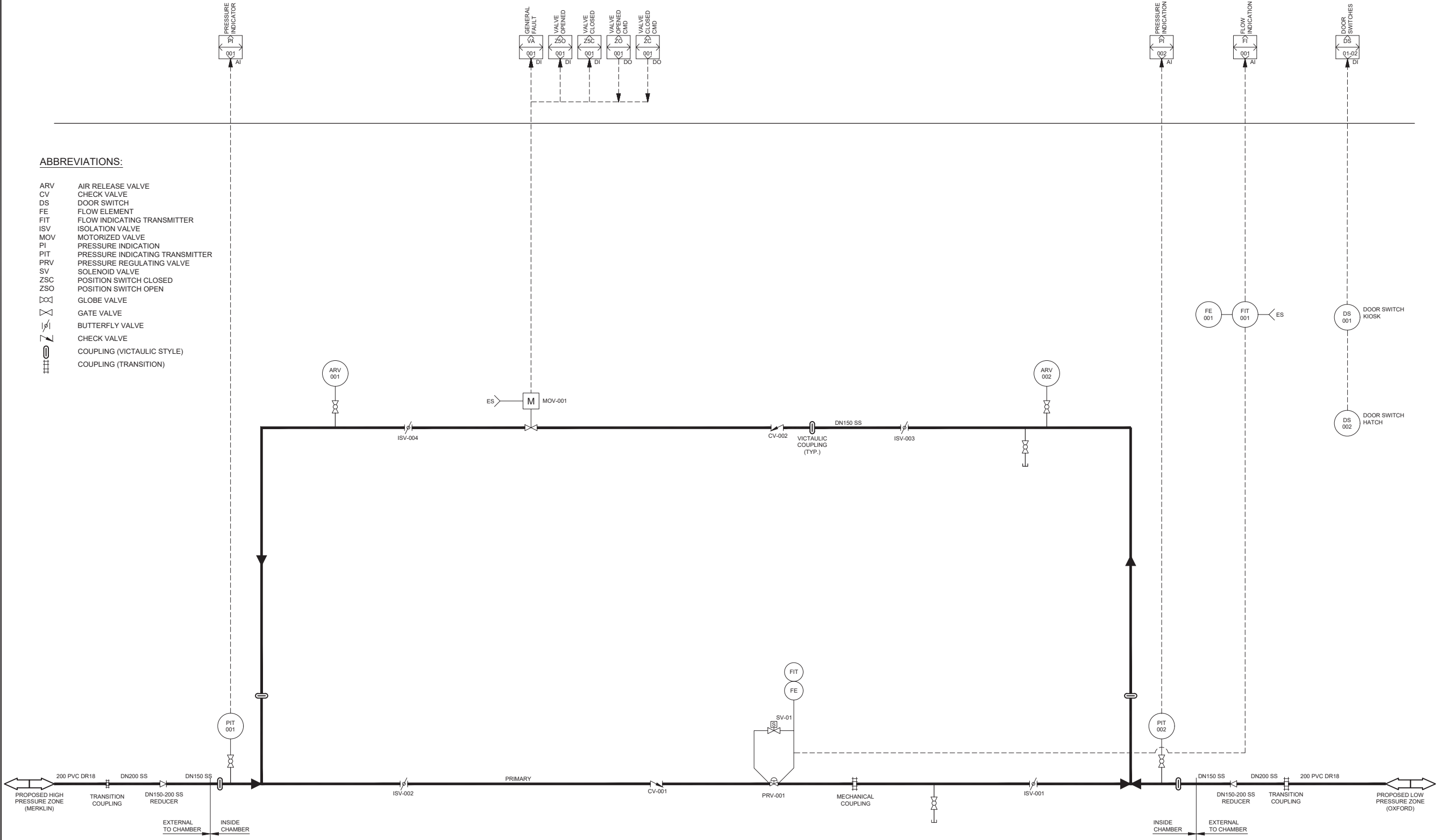
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Client
**CITY OF WHITE ROCK
BRITISH COLUMBIA**
Project
EVERALL PRV STATION

3	ISSUED FOR TENDER	LG	CB	July 22, 2019
2	FOR FINAL REVIEW	LG	CB	May 23, 2019
1	ISSUED FOR 95% REVIEW	CRJ	CB	Mar. 29, 2019
No.	Issue	Drawn	Approved	Date
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Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER	
Project Manager	C.BAECHLER	Date	Mar. 29, 2019	
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Project No. **11181229-02(004)**
Title
**PRV CHAMBER
PROCESS AND
INSTRUMENTATION DIAGRAM**

Sheet No.
P-01



MECHANICAL SPECIFICATIONS

1. GENERAL
- THE GENERAL CONDITIONS OF THE CONTRACT, GENERAL REQUIREMENTS, FORM AN INTEGRAL PART OF THE REQUIREMENTS OF THIS SECTION.
- 1.1 GENERAL REQUIREMENTS
- .1 THE COMPLETE INSTALLATION SHALL BE INSTALLED TO THE APPROVAL OF ALL LOCAL AND PROVINCIAL CODES, REGULATIONS AND LOCAL INSPECTION.

.2 MANUFACTURER'S REQUIREMENTS OVER AND ABOVE THOSE SHOWN OR SPECIFIED SHALL BE ADHERED TO.

.3 SUBMIT THREE (3) COPIES OF MAINTENANCE MANUALS AND 1 USB COPY IN PDF AND NATIVE.DOC FORMATS.

.4 HYDRO TEST ALL NEW PIPE TO ONE AND A HALF TIMES THE DESIGN PRESSURE (MINIMUM TEST PRESSURE IS 1034 KPA (150 PSIG) IN ACCORDANCE WITH ANSI B31.3.

.5 WELDING CODES AND STANDARDS SHALL BE IN ACCORDANCE WITH CSA STANDARD Z183, LATEST VERSION

.6 WHEN THE WORK HAS BEEN COMPLETED AND WARRANTS TESTING, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THIS INTENTION TO TEST, AND SHALL OUTLINE HIS PLANS FOR TESTING PROCEDURE AND TIMING. THE PERMISSION TO TEST BY ENGINEER DOES NOT IN ANY WAY RELIEVE FINAL RESPONSIBILITY FOR ALL ASPECTS OF OPERATING THE EQUIPMENT AND DAMAGE ARISING OUT OF THE OPERATION OF THE EQUIPMENT.

.7 GUARANTEE INSTALLED EQUIPMENT AND WORKMANSHIP FOR 12 MONTHS AFTER CERTIFICATION OF COMPLETION.

.8 OBTAIN NECESSARY PERMITS PAY ALL APPLICABLE FEES. ON COMPLETION, OBTAIN A CERTIFICATE OF APPROVAL FROM THE LOCAL INSPECTION DEPARTMENT, TURN OVER THE CERTIFICATE(S) TO ENGINEER.
2. PRODUCTS
- 2.1 PIPE MATERIAL STANDARD
- .1 ALL PIPE SHALL BE SCH 40 316 SS.

.2 FITTINGS: ANSI A21-10/AWWA C110 DIMENSIONALLY AND AWWA C153 FOR WALL THICKNESS. STAINLESS STEEL PIPE AND FITTINGS SHALL CONFORM TO ASME B16.9

.3 FLANGES: ALL REQUIRED SIZES TO ANSI/AWWA C110/A210.10 WITH DRILLING AND FACING TO STANDARD B16.5, CLASS 150 FLAT FACED.

.4 GASKETS: 2MM (1/8 INCH) FULL FACE RED RUBBER.

.5 BOLTS AND NUTS: HEX-HEAD BOLTS AND NUTS ASTM A193 B8 BOLTS TO ASTM A194 B8 NUTS, UTILIZE PLATED STEEL BOLTING FOR GROOVED JOINT COUPLERS.

.6 PIPE COUPLING: VICTAULIC STYLE 89 FOR RATED WORKING PRESSURE OF 150 PSI MINIMUM, AWWA FLUSH SEAL, CLASS M GASKETS, FOR PRESSURE SUCTION PIPING SHALL BE MANUFACTURE'S RECOMMENDATION FOR VACUUM APPLICATION; FLUSH SEAL MODELED GASKETS AS SUPPLIED BY VICTAULIC OR APPROVED EQUAL.
- 2.2 PIPE PROTECTION
- .1 ALL UNDERGROUND STEEL/IRON, COUPLINGS, PIPE AND FITTINGS SHALL BE TAPE COATED IN ACCORDANCE WITH AWWA C209-90.

.2 ALL STEEL /IRON PIPE AND FITTINGS SHALL BE INTERNALLY SHOP COATED IN ACCORDANCE WITH THE AWWA STANDARD C210-76.
- 2.3 PAINT FINISH
- .1 ALL NON-STAINLESS STEEL INTERIOR EXTERIOR PROCESS PIPING SHALL BE PAINTED WITH IN>13-A PREMIUM, SEMI-GLOSS. ALL SHOP PRE-PAINTED EQUIPMENT TO BE LEFT AS FACTORY FINISHED.

.2 COLOR SCHEDULE WILL BE PROVIDED BY THE OWNER.
3. INSTALLATION
- 3.1 MECHANICAL
- .1 INSTALL EQUIPMENT IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE RESPECTIVE EQUIPMENT MANUFACTURER, EXCEPT WHERE MORE STRINGENT PROCEDURES ARE NOT CLEAR OR NOT COMPLETE. THE BEST MODERN PRACTICE SHALL BE FOLLOWED, SUBJECT TO THE APPROVAL OF THE RESIDENT ENGINEER.

.2 THE EQUIPMENT AND MACHINERY SHALL BE ASSEMBLED, PROPERLY LOCATED, POSITIONED AND FASTENED SECURELY IN SUCH A MANNER AS TO GIVE PROPER PERFORMANCE.
4. VALVES
- .1 PRESSURE REDUCING VALVE - CLA-VAL E90-01

.2 CHECK VALVE - SWING-FLEX VAL-MATIC VALVE AND SURGEBUSTER CHECK VALVE

.3 ISOLATION VALVE - BRAY BUTTERFLY VALVE C/W GEAR OP AND HANDWHEEL

.4 AIR RELEASE VALVE - VAL-MATIC 15A AIR RELEASE VALVE AND 201C COMBINATION AIR RELEASE VALVE.
5. BLOW-OFF VALVE - IN ACCORDANCE WITH DETAIL 1, DRAWING C-04.
6. FLOW METER
- .1 CLA-VAL X144D E-FLOWMETER WIUTH DISPLAY.



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Client
**CITY OF WHITE ROCK
BRITISH COLUMBIA**

Project
EVERALL PRV STATION

3	ISSUED FOR TENDER	DJM	CB	July 22, 19
2	FOR FINAL REVIEW	DJW	CB	May 23, 19
1	ISSUED FOR 95% REVIEW	DJW	CB	Mar. 29, 19
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Drafting Check	T.GERMSHEID	Design Check	C. BAECHLER	
Project Manager	C. BAECHLER	Date	Jul. 19, 19	
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Title
**MECHANICAL
SPECIFICATIONS**

Sheet No.
M-01



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**CITY OF WHITE ROCK
BRITISH COLUMBIA**

Project

EVERALL PRV STATION

3	ISSUED FOR TENDER	LG	CB	July 22, 19
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1	ISSUED FOR 95% REVIEW	DJW	CB	Mar. 29, 19
No.	Issue	Drawn	Approved	Date

Drawn	D.WHITFIELD	Designer	B.SAMUELL
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Drafting	T. GERMSHEID	Design	C. BAECHLI
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Project	C. BAEGULER	Date	May 20, 2004
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ANSI D

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Project No. **11181229-02(004)**

Title

PRV CHAMBER MECHANICAL LAYOUT

Sheet No.

M-02




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1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. MATERIAL: ALUMINIUM
3. FINISH: MILL
4. LOADING: 300 PSF
5. 316 SS NUTS AND BOLTS
6. AREA OF FRAME IN CONTACT WITH CONCRETE TO BE PAINTED WITH BITUMINOUS COATING
7. SAFETY GRATING TO BE PAINTED WITH SAFETY ORANGE POWDER COAT.

**CITY OF WHITE ROCK
BRITISH COLUMBIA**

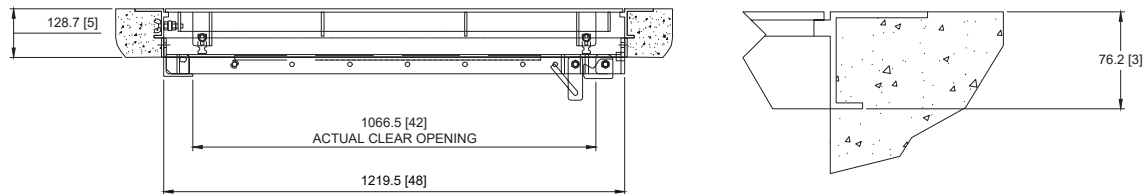
EVERALL PRV STATION

Drawn	S.BRIGGS	Designer	B.SAMUELL
Drafting Check	T.GERMSHEID	Design Check	C. BAECHLER
Project Manager	C. BAECHLER	Date	Feb. 26, 19
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Title

M-03

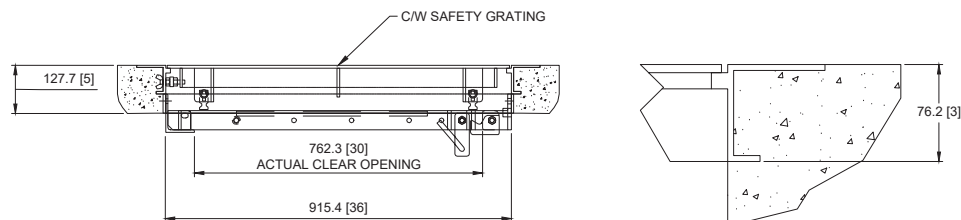
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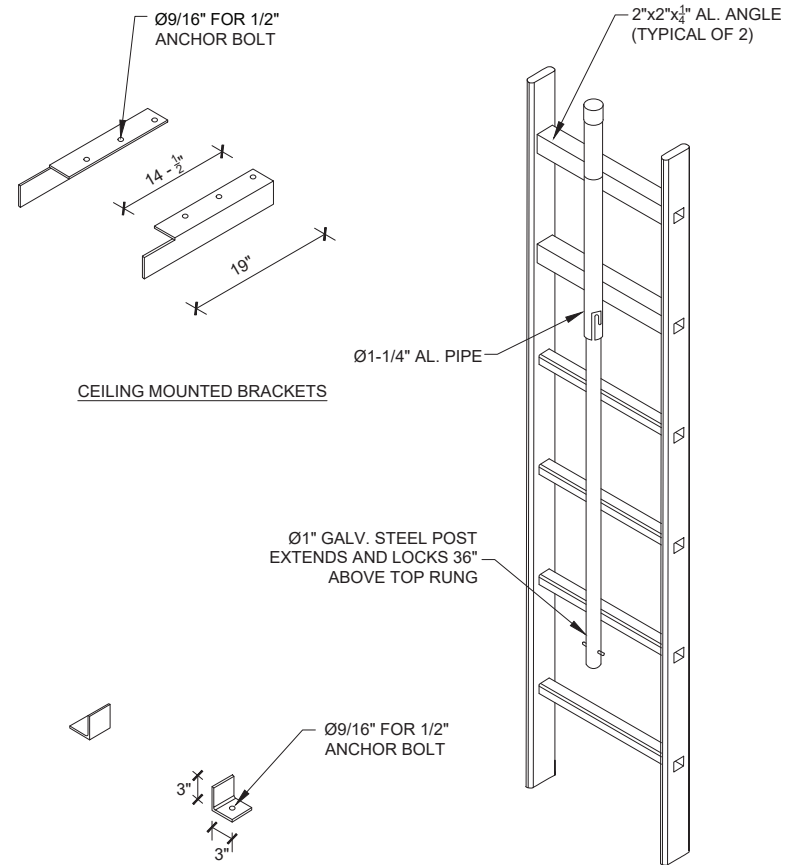
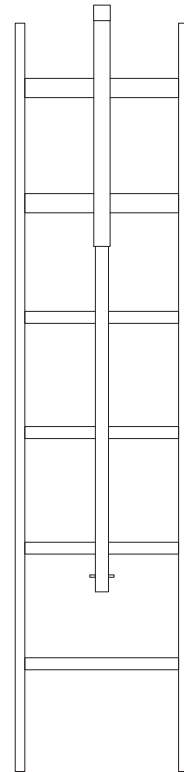
M-02



1:10

2

M-02



FOOT BRACKETS

1:10

33

M-02

1. GENERAL CLAUSES

- 1.1. GENERAL REQUIREMENTS, INSTRUCTIONS TO BIDDERS, SPECIFICATIONS AND DRAWINGS FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. UNLESS SPECIFICALLY NOTED OTHERWISE, WORK SHALL INCLUDE THE FURNISHING OF ALL LABOUR AND MATERIALS TO COMPLETE AND PUT INTO OPERATING CONDITION ALL ELECTRICAL AND INSTRUMENTATION AND CONTROL SYSTEMS AS INDICATED ON DRAWINGS AND SPECIFICATIONS HEREIN.
- 1.2. THESE SPECIFICATIONS AND DRAWINGS ARE TO BE READ TOGETHER WITH SPECIFICATIONS AND DRAWINGS OF ALL OTHER DIVISIONS. ADDITIONAL INFORMATION NECESSARY TO COMPLETE THE WORK IS INCLUDED IN OTHER SECTIONS OF DRAWINGS AND SPECIFICATIONS.
- 1.3. WORD "SUPPLY" SHALL MEAN THAT SO NOTED EQUIPMENT IS TO BE PURCHASED, ASSEMBLED, AND SHIPPED UNDAMAGED TO SITE. WHERE AN ITEM IS SUPPLIED BY THE OWNER, BY OTHERS OR BY ANOTHER DIVISION, THE WORK OF MOUNTING, CONNECTING AND COMMISSIONING THE ITEM SHALL BE INCLUDED IN THE CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE.
- 1.4. WORD "PROVIDE" SHALL MEAN THAT THE SO NOTED EQUIPMENT IS TO BE SUPPLIED, INSTALLED, CONNECTED, ADJUSTED, CALIBRATED, TUNED, CLEANED, COMMISSIONED, AND PLACED INTO FULL SERVICE.
- 1.5. WORD "INSTALL" SHALL MEAN TO PUT THE SPECIFIED ITEM INTO FULL OPERATION, SECURELY FASTENED AND CONNECTED TO THE SYSTEM. CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIAL WHICH IS NECESSARY TO SECURELY FASTEN AND GIVE A PRESENTABLE FINISHED APPEARANCE INCLUDING ALL NECESSARY CONNECTIONS AND CONDUCTORS. SUCH NOTED EQUIPMENT MUST BE FULLY CALIBRATED AND TESTED.
- 1.6. DRAWING PACKAGE AND SPECIFICATIONS COVERED HEREIN PROVIDE GENERAL DESIGN GUIDELINES. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL FOR ALL EQUIPMENT (INCLUDING PANELS) AND DESIGN PRIOR TO CONSTRUCTION.

2. SCOPE

- 2.1. PROVIDE ALL ITEMS, MATERIAL, EQUIPMENT AND LABOUR AS REQUIRED FOR A COMPLETE AND AN OPERATIONAL SYSTEM AS MENTIONED HEREIN, OR INDICATED ON DRAWINGS.
- 2.2. THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO:
- 2.2.1. PROVIDE NEW ELECTRICAL KIOSK C/W PULL BOX, METERING SOCKET, MAIN FUSED DISCONNECT SWITCH, PANEL BOARD C/W A SURGE SUPPRESSOR, HEATER WITH ASSOCIATED THERMOSTAT, VALVE ACTUATOR REMOTE HAND STATION, CONTROL PANEL C/W ASSOCIATED EQUIPMENT, INTERNAL LIGHT WITH DOOR SWITCH, RECEPTACLE, COPPER GROUND BAR, PANDUITS AND WIRING.
- 2.2.2. PROVIDE A VALVE ACTUATOR, A SOLENOID VALVE, A FLOW ELEMENT C/W AN INDICATING TRANSMITTER, TWO PRESSURE INDICATING TRANSMITTERS, A HATCH DOOR SWITCH, LED LIGHT FIXTURE, CHANNEL TRAYS AND WIRING TO BE INSTALLED INSIDE THE PRV CHAMBER.
- 2.2.3. PROVIDE TWO (2) 6m COPPER GROUNDING WELL, ROD AND WELL CAP. BOND WITH #2/0 AWG GREEN COPPER WIRE TO KIOSK GROUND BAR.
- 2.2.4. PROVIDE UNDERGROUND SLEEVES AS INDICATED ON DRAWINGS.
- 2.2.5. PROVIDE ALL GROUNDING, INCLUDING BUT NOT LIMITED TO MAIN SERVICE DISCONNECT GROUNDING AND BONDING OF ALL ELECTRICAL EQUIPMENT TO GROUND BAR. GROUND BAR SHALL BE BONDED TO GROUND GRID AND ALL METAL PIPING SYSTEMS AS REQUIRED BY CANADIAN ELECTRICAL CODE.
- 2.2.6. PROVIDE ALL REQUIRED CABLE TIES, ATTACHMENT TAPE AND TAGS.
- 2.2.7. PROVIDE ALL REQUIRED CABLING, SLEEVES AND CONNECTION OF ALL EQUIPMENT TO CONTROL PANEL AS INDICATED ON DRAWINGS.
- 2.2.8. PROVIDE FIELD COMMISSIONING, ADJUSTMENT AND CERTIFIED MANUFACTURERS ACCEPTANCE REPORTS FOR ALL ELECTRICAL, INSTRUMENT AND CONTROL EQUIPMENT AND SYSTEMS.
- 2.2.9. PROVIDE O&M MANUALS.
- 2.2.10. PROVIDE SHOP DRAWINGS FOR APPROVAL FOR ALL EQUIPMENT, INCLUDING DISTRIBUTION PANELBOARD, ELECTRICAL KIOSK, VALVE ACTUATOR INCLUDING REMOTE HAND STATION, CONTROL PANEL (ENGINEERED SHOP DRAWINGS), MAIN SERVICE FUSED DISCONNECT SWITCH, TVSS, LIGHTING FIXTURES, UPS, 24VDC POWER SUPPLY, SCADA, INSTRUMENTS AND CONTROL DEVICES, ETC.
- 2.2.11. CONTRACTOR SHALL BE FULLY QUALIFIED AND EQUIPPED TO CARRY OUT TESTING OF ALL ELECTRICAL, CONTROL AND POWER EQUIPMENT AND SYSTEMS OR AS AN ALTERNATIVE, SHALL PROVIDE THE SERVICES OF A QUALIFIED MANUFACTURER'S REPRESENTATIVE TO CARRY OUT TESTING.
- 2.2.12. PROVIDE ALL CABLING, WIREWAYS AND MATERIAL FOR POWER SUPPLY OF ALL EQUIPMENT.
- 2.2.13. COORDINATE WITH POWER UTILITY PROVIDER FOR ELECTRICAL SERVICE. THE SCOPE INCLUDES ALL NECESSARY APPLICATIONS, STEPS AND FEES ASSOCIATED WITH A NEW CONNECTION UP TO AND INCLUDING UTILITY POWER ENERGIZATION.

3. DISCREPANCY

- 3.1. VIEW PLANS, VISIT SITE AND CHECK PLANS AGAINST EXISTING CONDITIONS. SHOULD ANY DISCREPANCY EXIST BETWEEN THE SPECIFICATION AND DRAWINGS FOR THE ACTUAL CONDITIONS ON JOB SITE, A RULING SHALL BE OBTAINED FROM THE ENGINEER BEFORE THE FINAL PRICE IS SUBMITTED.
4. CODE AND PERMITS
- 4.1. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL BUILDING BYLAW AND THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE, AS AMENDED AND ADAPTED BY THE LOCAL AUTHORITY. OBTAIN ALL NECESSARY PERMITS AND LICENSES AND PAY ALL FEES IN CONNECTIONS WITH THE WORK.

5. IDENTIFICATION

- 5.1. IDENTIFY ALL EQUIPMENT (CONTROL PANELS, PANELBOARDS, MAIN FUSED DISCONNECT SWITCH, ETC.) WITH STAINLESS STEEL NAME PLATES. IDENTIFY FEEDERS AND CIRCUIT WIRES AS PER CODE AND CONTRACT REQUIREMENTS.
- 5.2. PROVIDE STAINLESS STEEL NAME PLATE ON PANEL COVERS TO IDENTIFY VOLTAGE AND PANEL TAG. SUBMIT ALL NAMEPLATES AND TAGS FOR APPROVAL.

6. RECORD DRAWINGS (AS-BUILT)

- 6.1. OBTAIN A COPY OF CLEAN FULL SIZE DRAWING AND MAKE ALL AS BUILT CHANGES ON CLEAN DRAWING. PROVIDE A COPY OF AS BUILT DRAWINGS TO ENGINEER FOR RECORD FILES. SUBMIT ALL DRAWINGS TO PROJECT MANAGER UPON OF COMPLETION OF WORK.
- 6.2. SHOW ALL PULL BOXES, JUNCTION BOXES, SLEEVES AND CIRCUIT NUMBERS ON RECORD DRAWINGS.

7. ELECTRICAL KIOSK

- 7.1. THE WORK INCLUDES AN ELECTRICAL KIOSK C/W ALL ASSOCIATED EQUIPMENT AS INDICATED ON DRAWINGS.
- 7.2. ELECTRICAL KIOSK SHALL MEET THE FOLLOWING REQUIREMENTS:
- 7.2.1. THE ELECTRICAL KIOSK SHALL BE RATED NEMA 4X AND FABRICATED OF 316 STAINLESS STEEL.
- 7.2.2. THE ROOF SHALL BE FORMED WITH A 50mm CROWN AND 25mm RAIN GUTTERS ON ALL SIDES.
- 7.2.3. THE ELECTRICAL KIOSK SHALL COME WITH TWO LIFTING LUGS DESIGNED TO LIFT THE ENCLOSURE'S WEIGHT PLUS 500kg WITHOUT FAILURE.
- 7.2.4. CONTRACTOR SHALL SEAL KIOSK COMPARTMENT TO CONCRETE SLAB.
- 7.2.5. THE ELECTRICAL KIOSK DOOR AND SIDE WALLS SHALL BE EQUIPPED WITH TAMPER-PROOF LOUVERS.
- 7.2.6. THE BASE FRAME SHALL BE FORMED FROM A MINIMUM 75mm CHANNEL.
- 7.2.7. THE DOORS SHALL BE FULLY GASKETED WITH GREASABLE HINGES.
- 7.2.8. ENCLOSURE SHALL COME WITH INNER DOOR MOUNTED EQUIPMENT SPECIFICATION AND DRAWING POCKETS.
- 7.2.9. ALL EQUIPMENT SHALL BE TAGGED USING STAINLESS STEEL LABELS WITH 10 mm HIGH BLACK CHARACTERS AND STAINLESS STEEL SCREWS.
- 7.2.10. CONCRETE PAD SHALL BE PROVIDED BY CONTRACTOR.
- 7.2.11. ANCHOR BOLTS SHALL BE PROVIDED BY CONTRACTOR.
- 7.3. CONTROL PANEL CP-1 SHALL MEET THE FOLLOWING REQUIREMENTS:
- 7.3.1. CONTROL PANEL CP-1 SHALL BE RATED NEMA 4X AND CONSTRUCTED OF 316 STAINLESS STEEL C/W WALL MOUNTING BRACKETS.
- 7.3.2. CONTRACTOR SHALL SUPPLY AND INSTALL A UPS, 24VDC POWER SUPPLY C/W LEAD BATTERIES, CELLULAR ROUTER AND ANTENNA, SCADAPACK RTU MODULE, RED DUPLEX RECEPTACLE, BREAKERS, FUSED DISCONNECTS, CONTROL RELAYS C/W AUXILIARY CONTACTS, AND ALL OTHER EQUIPMENT AS SHOWN IN DRAWINGS INSIDE CONTROL PANEL.
- 7.3.3. CONTROL PANEL CP-1 SHALL BE OVERSIZED WITH AMPLE WORKING SPACE AROUND THE INTERNAL EQUIPMENT.
- 7.3.4. CONTRACTOR SHALL SUPPLY AND INSTALL OVERSIZED PANDUITS, TERMINAL BLOCKS AND COPPER GROUND BAR.
- 7.3.5. CONTROL PANEL CP-1 SHALL BE SUPPLIED AND INSTALLED WITH A 24VDC LED LIGHT AND DOOR SWITCH.
- 7.3.6. ENCLOSURE SHALL COME WITH INNER DOOR MOUNTED EQUIPMENT SPECIFICATION AND DRAWING POCKETS.
- 7.3.7. ALL EQUIPMENT SHALL BE TAGGED USING STAINLESS STEEL LABELS WITH 10 mm HIGH BLACK CHARACTERS AND STAINLESS STEEL SCREWS.

8. MISCELLANEOUS ELECTRICAL EQUIPMENT

- 8.1. ROTORK IQT3 RANGE VALVE ACTUATOR WITH RATING AND OPTIONS AS SHOWN ON DRAWING E-11.
- 8.2. MAGNETIC FLOW METER
- 8.2.1. SIZE DN200
- 8.2.2. PROCESS CONNECTION RATING CLASS 150
- 8.2.3. POWER SUPPLY: 24VDC
- 8.2.4. OUTPUT: 4-20mA
- 8.2.5. MECHANICAL PROTECTION: IP66
- 8.2.6. REMOTE - MOUNTED FLOW TRANSMITTER
- 8.2.7. DIGITAL LCD DISPLAY
- 8.2.8. LINING MATERIAL: POLYURETHANE
- 8.2.9. ELECTRODE MATERIAL: SS316
- 8.2.10. MANUFACTURER AND MODEL: CLA-VAL X144D E-FLOWMETER WITH INTEGRAL DISPLAY
- 8.3. DOOR CONTACT
- 8.3.1. MINIMAL RATED VOLTAGE: 120VAC AND/OR 24VDC
- 8.3.2. RATED OPERATIONAL CURRENT: 10AMP
- 8.3.3. MECHANICAL PROTECTION: IP66
- 8.3.4. 1 N.O. AND 1 N.C CONTACT
- 8.3.5. 6000 OPERATING CYCLES
- 8.3.6. TWIST ROLLER LEVER, WITH ADJUSTABLE LENGTH
- 8.4. PRESSURE TRANSMITTER
- 8.4.1. MEASURING RANGE: 0-200 kPa
- 8.4.2. ALUMINUM NEMA 4X HOUSING
- 8.4.3. DIGITAL LCD DISPLAY
- 8.4.4. OUTPUT: 4-20mA, LOOP POWERED
- 8.4.5. PROCESS CONNECTION: 1/4" NPT
- 8.4.6. CSA APPROVED
- 8.4.7. MANUFACTURER AND MODEL: ENDRES + HAUSER CERABAR PMP71 OR SEIMENS SITRANS P DS III
- 8.5. SOLENOID VALVE
- 8.5.1. FOLLOW MECHANICAL DRAWINGS FOR MAKE / MODEL
- 8.5.2. SOLENOID RATING: 4-20mA, LOOP POWERED

9. GUARANTEE

- 9.1. WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF WORK, REPLACE OR REPAIR, AT OWN EXPENSE, ANY DEFECT IN MATERIAL, WORKMANSHIP OR INSTALLATION OR ANY CODE VIOLATIONS.

10. MATERIALS AND INSTALLATION

- 10.1. ALL MATERIALS SHALL BE NEW.
- 10.2. ALL MATERIALS SHALL BE INDUSTRIAL GRADE AND CSA APPROVED WITH CSA STAMP.
- 10.3. PROVIDE SHOP DRAWINGS FOR ALL EQUIPMENT INSTALLED.
- 10.4. EXTEND ALL CONDUITS AND TECK CABLES TO ACCESSIBLE SPACE AS REQUIRED. DO NOT SPLICE CABLES.

11. GROUNDING

- 11.1. PROVIDE GROUNDING AS PER CANADIAN ELECTRICAL CODE REQUIREMENTS.
- 11.2. PROVIDE TWO (2) 6m COPPER GROUNDING WELL, ROD AND WELL CAP.

12. SPECIFIC CLAUSES

- 12.1. CABLES AS LISTED IN DRAWINGS.
- 12.2. SUPPLY AND INSTALL POWER FEEDERS AND CONTROL WIRING TO ACHIEVE THE WIRING CONNECTION SHOWN ON DRAWINGS AND PROVIDE ALL CONNECTORS, JUNCTION BOXES, TECK CABLE CONNECTORS, CABLE SUPPORTS, CHANNEL TRAYS AND ALL ACCESSORIES AS REQUIRED.
- 12.3. PROVIDE IDENTIFICATION TAG WITH CABLE AND CIRCUIT NUMBER FOR FEEDERS, JUNCTION BOXES AND PANELS. USE P-TOUCH MACHINE TO LABEL WIRING DEVICES AND TERMINATIONS ASSEMBLIES.
- 12.4. EXACT ROUTING FOR ALL CABLES, CONDUITS AND FEEDERS TO BE CONFIRMED ONSITE TO SUIT SITE CONDITIONS.
- 12.5. APPROVED TECK 90 CONNECTORS SHALL BE UTILIZED.
- 12.6. CONTRACTOR SHALL HIRE A THIRD PARTY TO PROVIDE SCADA PROGRAMMING AND INTEGRATION INTO THE CITY OF WHITE ROCK'S SCADA SYSTEM AS PART OF CONTRACTORS SCOPE OF WORK. THIS THIRD PARTY MUST BE ON THE CITY OF WHITE ROCK'S APPROVED LIST OF SCADA SYSTEM VENDORS. CONSULT WITH THE CITY OF WHITE ROCK PRIOR TO PROCUREMENT OF EQUIPMENT/SERVICES.
- 12.7. CONTRACTOR SHALL PROVIDE ALL SCADA AND COMMUNICATION HARDWARE IN ACCORDANCE WITH THE CITY OF WHITEROCK'S SPECIFICATIONS AND REQUIREMENTS FOR FULL INTEGRATION WITH THE CITY'S EXISTING SCADA SYSTEM. CONTRACTOR SHALL CONSULT WITH THE CITY OF WHITE ROCK PRIOR TO PROCUREMENT OF EQUIPMENT /SERVICES.

13. EQUIPMENT INSTALLATION

- 13.1. SUPPLY AND INSTALLATION OF PIPING AND EQUIPMENT ANCHORING BY CONTRACTOR.
- 13.2. MAINTAIN MINIMUM WORKING SPACE AROUND COMPONENTS ACCORDING TO MANUFACTURER'S RECOMMENDATION AND CEC.
- 13.3. CONTRACTOR SHALL COORDINATE AND CONDUCT, IN CONJUNCTION WITH ENGINEER AND OWNER, THE SITE ACCEPTANCE TESTING. THIS TESTING WILL CONSIST OF FUNCTIONAL AND OPERATIONAL TESTS AND COMMISSIONING OF THE OVERALL SYSTEM.
- 13.4. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DEMONSTRATION OF PROPER OPERATION OF EQUIPMENT.
- 13.5. SHOULD SYSTEM FAIL TO MEET TEST REQUIREMENTS, MAKE NECESSARY REPAIRS WITH HELP / ASSISTANCE FROM EQUIPMENT SUPPLIER, AND REPEAT SITE TEST FOR AT LEAST 24 HOUR DURATION.
- 13.6. CONTRACTOR SHALL MAINTAIN SITE TEST RECORD LOG/SHEETS WHICH RECORD TEST CONDITIONS AND LOGGED DATA. RECORDING AND TEST RECORDING FORMAT SHALL BE SUPPLIED BY MANUFACTURER AND SHALL BE NEAT AND READILY LEGIBLE. PROVIDE TEST COPIES TO THE OWNER FOR INCLUSION IN INSTRUCTION MANUALS.

14. GENERAL

- 14.1. CLEAN UP AND REMOVE ALL UNUSED CABLE, WIRING AND CONDUITS.
- 14.2. CONFIRM EQUIPMENT LOCATIONS AND MOUNTING HEIGHT WITH ENGINEER PRIOR TO INSTALLATION.
- 14.3. FIRE PROOF ALL FIRE RATED PENETRATIONS AFTER INSTALLATION TO COMPLY WITH LOCAL FIRE CODES.



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CITY OF WHITE ROCK
BRITISH COLUMBIA

Project

EVERALL PRV STATION

3	ISSUED FOR TENDER	LG	CB	July 22, 19
2	FOR FINAL REVIEW	LG	CB	May 23, 19
1	FOR REVIEW	DCM	CB	19-05-02

No.	Issue	Drawn	Approved	Date
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Drawn	S.BRIGGS	Designer	A.KHALILZADEH
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Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER
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Project Manager	C.BAECHLER	Date	July 19, 2019
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ANSI D	0 20mm

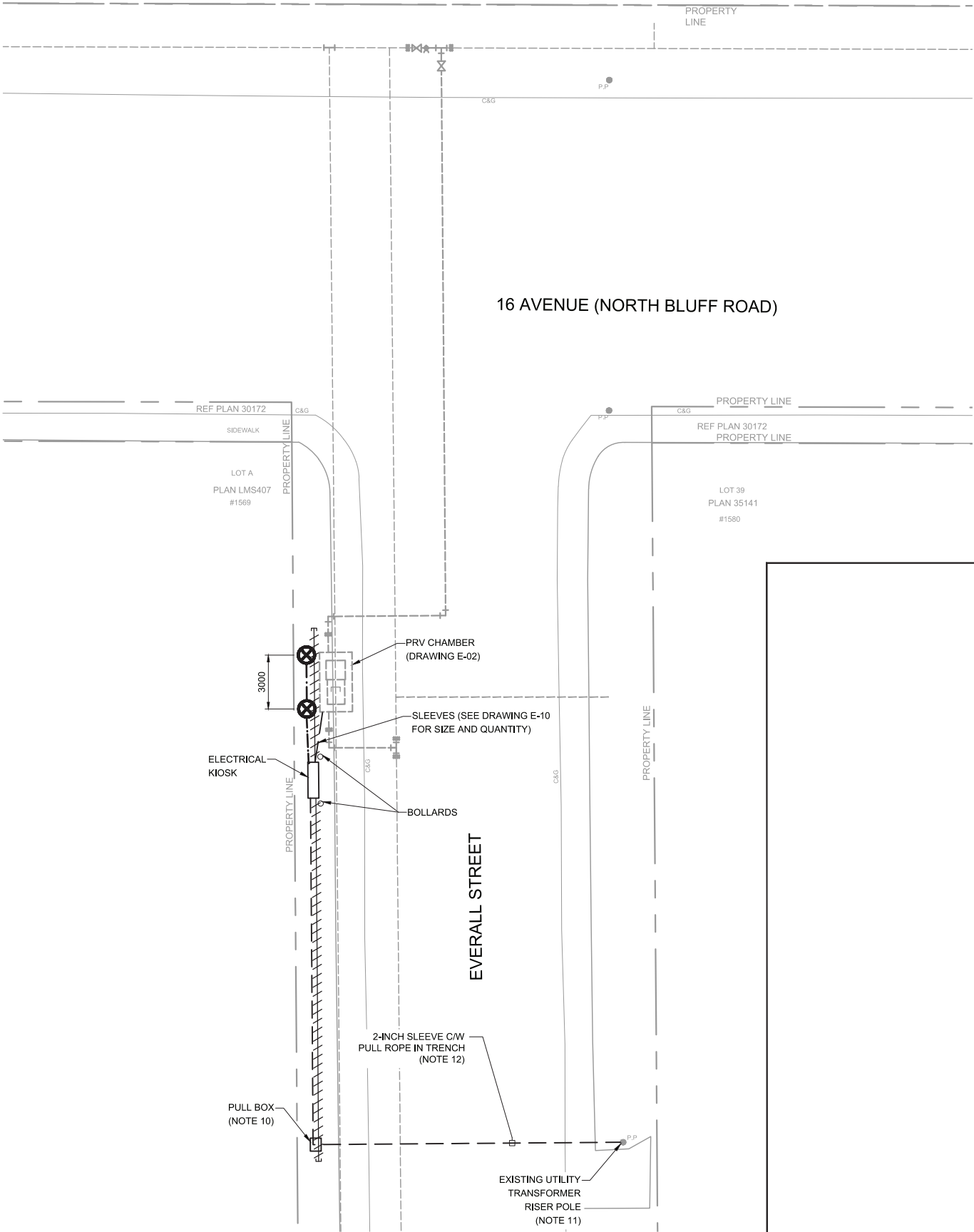
Project No. 11181229-02 (004)

Title

ELECTRICAL
GENERAL NOTES

Sheet No.

E-00



LEGEND:

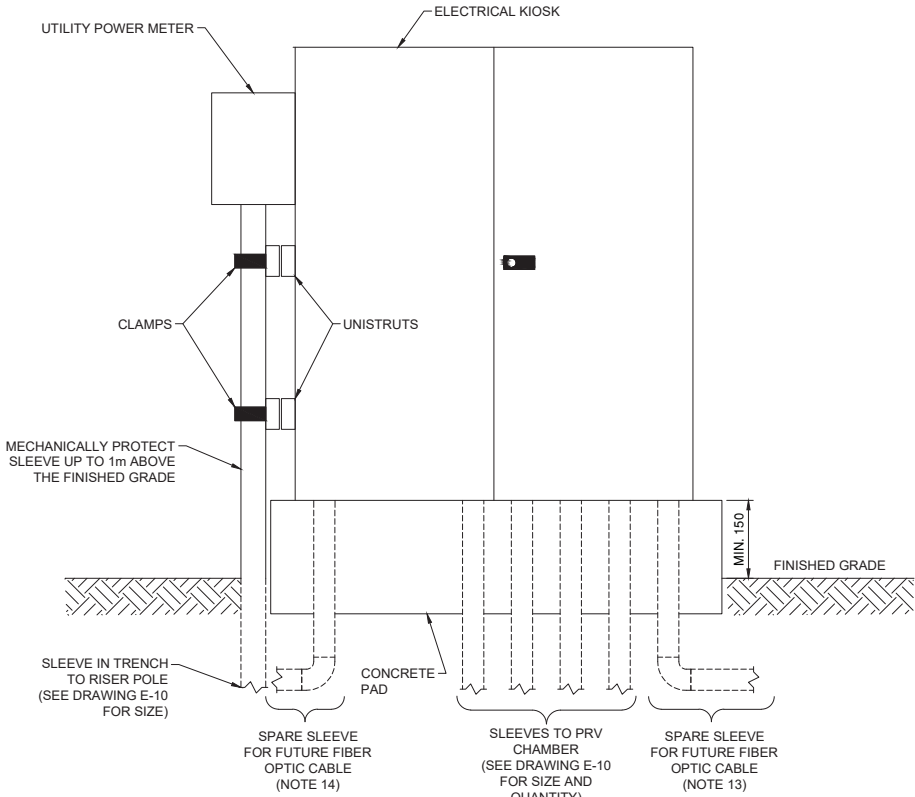
- BURIED CABLE OR CABLES IN RIGID PVC SLEEVE
- ++++ SPARE RIGID PVC SLEEVE (FOR FUTURE FIBER OPTIC CABLE)
- ⊗ GROUNDING WELL C/W A 6m LONG, 1" DIAMETER COPPER BONDED STELL GROUND ROD AND WELL CAP
- ▲ GROUNDING CONDUCTOR, 600mm BELOW FINISHED GRADE IN NATIVE SOIL
- COMPRESSION CONNECTION: FOR BONDING GROUNDING CONDUCTOR TO GROUNDING CONDUCTOR
- BOLTED CONNECTION: FOR BONDING EQUIPMENT / TRAY TO GROUNDING CONDUCTOR
- #2/0 AWG BARE COPPER CONDUCTOR: FOR GROUND GRID CONDUCTORS
- #2/0 AWG GREEN COPPER CONDUCTOR: FOR CONNECTING SERVICE ENTRANCE GROUND BAR TO THE GROUND GRID
- #2 AWG GREEN COPPER CONDUCTOR: FOR BONDING AND GROUNDING ALL EQUIPMENT RATED 600V AND BELOW

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- ALL LOCATIONS IN THE SCOPE OF WORK ARE NON-HAZARDOUS.
- THE ELECTRICAL KIOSK IS NOT DRAWN TO SCALE IN THIS DRAWING.
- CONTRACTOR SHALL SUPPLY AND INSTALL THE ELECTRICAL KIOSK. ENCLOSURE SHALL BE FREE STANDING, PADLOCKABLE, RATED NEMA 4X AND MADE OF 316 RATED STAINLESS STEEL C/W LIFTING LUGS. ENCLOSURE SHALL BE BOLTED AND SECURED TO THE CONCRETE PAD.
- ELECTRICAL KIOSK CONCRETE PAD MUST BE SIZED ADEQUATELY WITH MINIMUM 6-INCH SIDE LIPS AROUND THE ENCLOSURE. IT SHALL BE PLACED ON COMPACTED SOIL.
- ALL SLEEVE ENTRIES INTO THE ELECTRICAL KIOSK MUST BE BOTTOM ENTRY.
- ALL PENETRATIONS INTO THE ELECTRICAL KIOSK SHALL BE WEATHERPROOF SEALED. THE ELECTRICAL KIOSK MUST REMAIN RODENT-PROOF UPON COMPLETION OF WORK.
- ALL SLEEVES SHALL BE SCHEDULE 40 RIGID PVC, SUPPLIED AND INSTALLED BY CONTRACTOR. BEND FITTINGS MUST BE FACTORY BENT WITH MINIMUM 300mm BENDING RADIUS. APPLY LUBRICANT WHEN PULLING CABLES THROUGH SLEEVES.
- DELINEATION IN THE SCOPE OF WORK BETWEEN THE CONTRACTOR AND UTILITY PROVIDER SHALL BE COORDINATED WITH THE UTILITY PROVIDER IN CONJUNCTION WITH THE ENGINEER. CONTRACTOR IS RESPONSIBLE FOR TRENCHING, DIRECTIONAL DRILLING, PULL BOXES, CONDUITS, CABLES, ETC. THAT FALL OUTSIDE THE UTILITY PROVIDER'S SCOPE OF WORK.
- CONTRACTOR SHALL SUPPLY AND INSTALL A PULL BOX IF NECESSARY.
- THIS RISER POLE IS ASSUMED TO BE THE TIE-IN LOCATION FOR NEW SERVICE. EXACT LOCATION SHALL BE DETERMINED BY THE UTILITY PROVIDER ONCE THE APPLICATION FOR NEW SERVICE IS FILED BY THE CONTRACTOR.
- FOR CONDUIT IN TRENCH DETAILS, CONTRACTOR SHALL FOLLOW MMCD STANDARD DETAIL DRAWING E3-2 FOR UNDERGROUND CONDUIT IN NON-PAVED AREAS AND STANDARD DETAIL DRAWING E3-1 FOR UNDERGROUND CONDUIT IN PAVED AREAS.
- CONTRACTOR SHALL SUPPLY AND INSTALL A 2" SCHEDULE 40 RIGID PVC CONDUIT FOR FUTURE FIBER OPTIC CABLE. THIS CONDUIT SHALL EXTEND NORTHWARD PAST GROUNDING WELLS C/W A 90° ELBOW, PULL ROPE AND AN END CAP TO SEAL BOTH ENDS.
- CONTRACTOR SHALL SUPPLY AND INSTALL A 2" SCHEDULE 40 RIGID PVC CONDUIT FOR FUTURE FIBER OPTIC CABLE. THIS CONDUIT SHALL EXTEND SOUTHWARD PAST THE PULL BOX C/W A 90° ELBOW, PULL ROPE AND AN END CAP TO SEAL BOTH ENDS. CONTRACTOR SHALL COORDINATE THIS CONDUIT RUN WITH THE ENGINEER AND THE CITY OF WHITE ROCK PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS:

- E-02 PRV CHAMBER ELECTRICAL LAYOUT
- E-10 POWER DISTRIBUTION DIAGRAM



ELECTRICAL KIOSK FRONT VIEW

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1:150
3 2 1 0 2 4 6m

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BRITISH COLUMBIA**
Project
EVERALL PRV STATION

3	ISSUED FOR TENDER	DJW	CB	July 22, 19
2	FOR FINAL REVIEW	LG	CB	May 23, 19
1	ISSUED FOR 95% REVIEW	LG	CB	Mar. 29, 19
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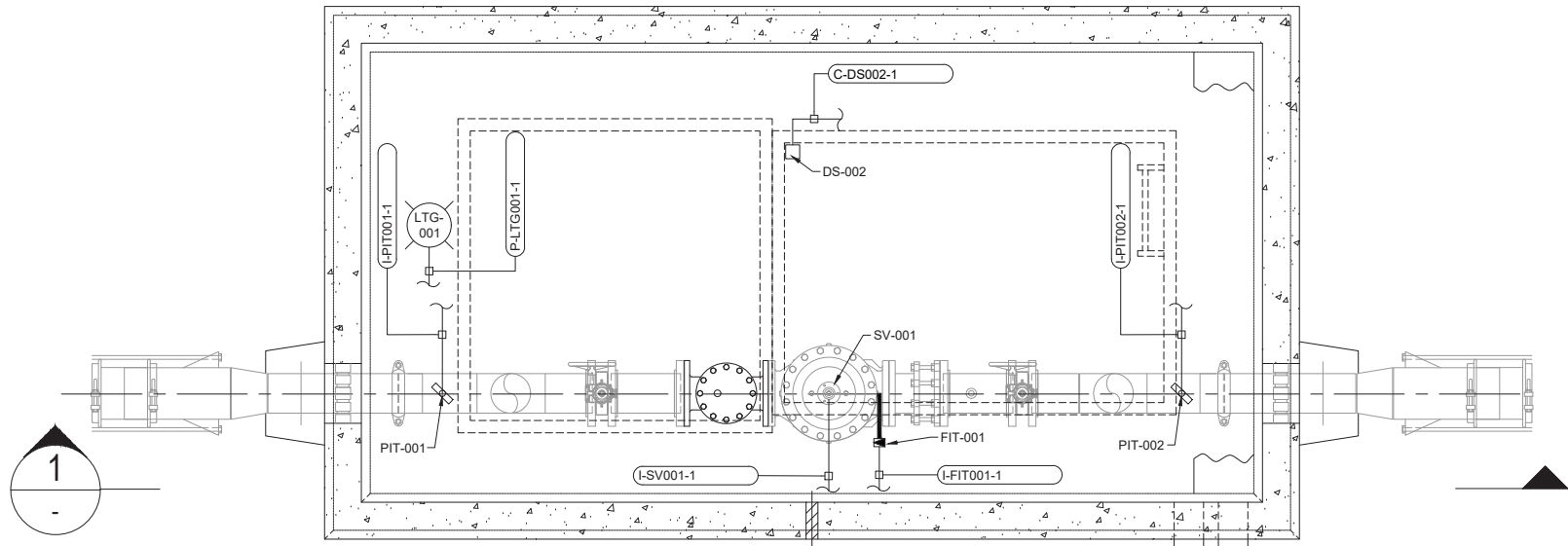
Drawn	S.BRIGGS	Designer	A.KHALILZADEH
Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER
Project Manager	C.BAECHLER	Date	Jul. 22, 19
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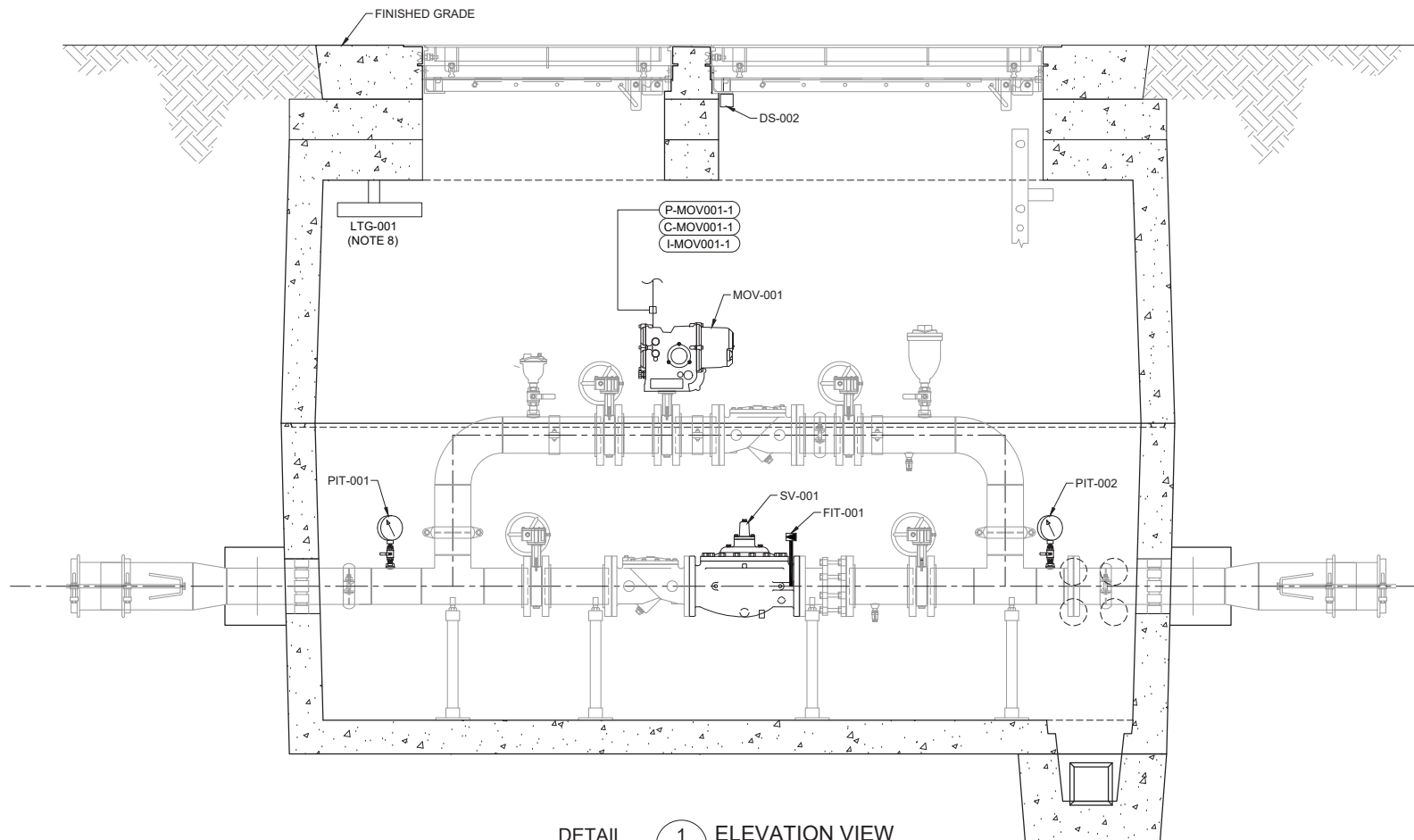
Title
ELECTRICAL SITE PLAN

Sheet No.

E-01



LAYOUT
1:12.5



DETAIL 1 ELEVATION VIEW
1:12.5

NOTES:

1. CONTRACTOR SHALL SUPPLY AND INSTALL 6-INCH ALUMINUM CHANNEL TRAYS (NOT SHOWN IN THIS DRAWING) FOR CARRYING CABLES INSIDE THE PRV CHAMBER. ALL CHANNEL TRAYS MUST BE SUPPLIED WITH COVER. PROVIDE ADEQUATE STRUCTURAL SUPPORT FOR ALL CHANNEL TRAYS AS PER TRAY MANUFACTURER'S GUIDELINES. CHANNEL TRAYS AND SUPPORT SYSTEM SHALL NOT HINDER ACCESS TO THE PIPING SYSTEM AND COMPONENTS.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL CHANNEL TRAYS WITH A #2AWG GREEN GROUND CONDUCTOR BONDED TO THE TRAY AT 2m INTERVALS USING COMPRESSION LUGS. MOV-001 GROUND TERMINAL SHALL BE BONDED TO THE GROUNDING CONDUCTOR IN CABLE TRAY VIA A #2AWG GREEN GROUND CONDUCTOR USING A COMPRESSION LUG. LTG-001 GROUND TERMINAL SHALL BE BONDED TO THE GROUNDING CONDUCTOR IN CABLE TRAY VIA A #2AWG GREEN GROUND CONDUCTOR USING A COMPRESSION LUG.
3. CONTRACTOR SHALL BOND ALL GROUNDING CONDUCTORS IN PVC SLEEVES TO THE GROUNDING CONDUCTOR IN CHANNEL TRAY USING COMPRESSION LUGS.
4. ALL PENETRATIONS INTO THE PRV CHAMBER SHALL BE WEATHERPROOF SEALED. THE CHAMBER MUST REMAIN RODENT-PROOF AND SEALED FOR WATER LEAKAGE UPON COMPLETION OF WORK.
5. CONTRACTOR SHALL INSTALL BARRIER IN CHANNEL TRAYS TO SEGREGATE POWER CABLES FROM INSTRUMENT/CONTROL CABLES.
6. CONTRACTOR SHALL BOND ALL METAL STRUCTURES IN THE PRV CHAMBER (INCLUDING THE CHAMBER HATCH) TO THE GROUNDING CONDUCTOR IN CHANNEL TRAY USING BOLTED CONNECTION.
7. EXACT HEIGHT AND LOCATION OF CONDUIT ENTRY INTO THE PRV CHAMBER SHALL BE FIELD DETERMINED FOR THE SIMPLEST AND THE LEAST INTRUSIVE WIRING LAYOUT TO THE PIPING SYSTEM.
8. EATON'S CROUSE-HINDS CHAMP PFM3LWY/UNV1 C/W CEILING MOUNT BRACKET AND P62 WIRE GUARD.
9. LAYOUT ONLY SHOWS THE BOTTOM PIPING TRAIN. MOV-001 IS NOT VISIBLE IN THIS LAYOUT.

REFERENCE DRAWINGS:

1. E-01 ELECTRICAL SITE PLAN



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0.1 0 0.2 0.4 0.6m
1:12.5


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BRITISH COLUMBIA

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Drawn	S.BRIGGS	Designer	A.KHALILZADEH
Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER
Project Manager	C.BAECHLER	Date	Jul. 12, 19
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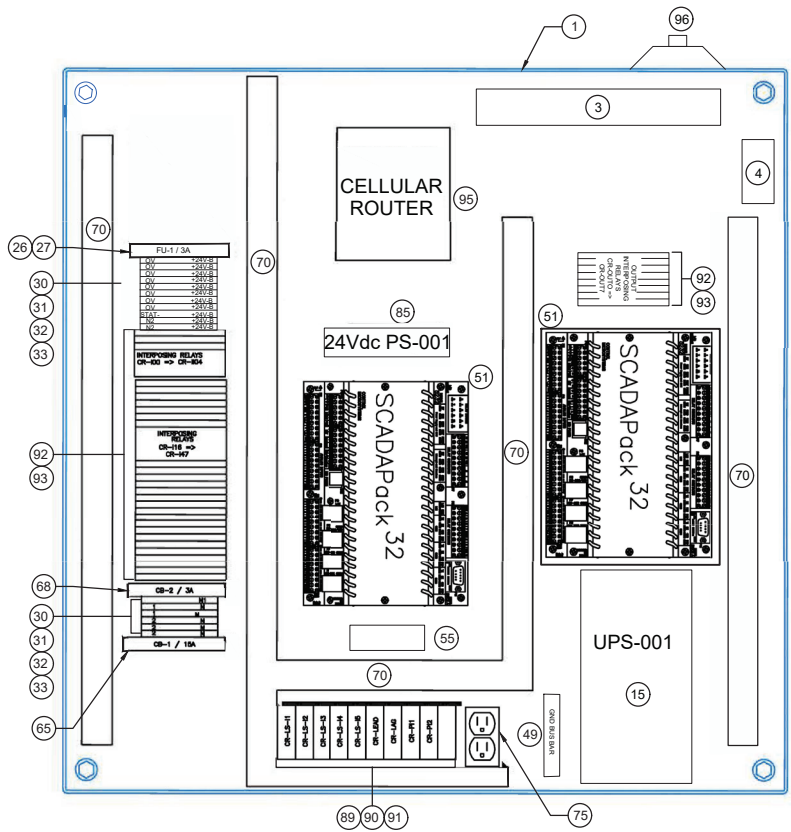
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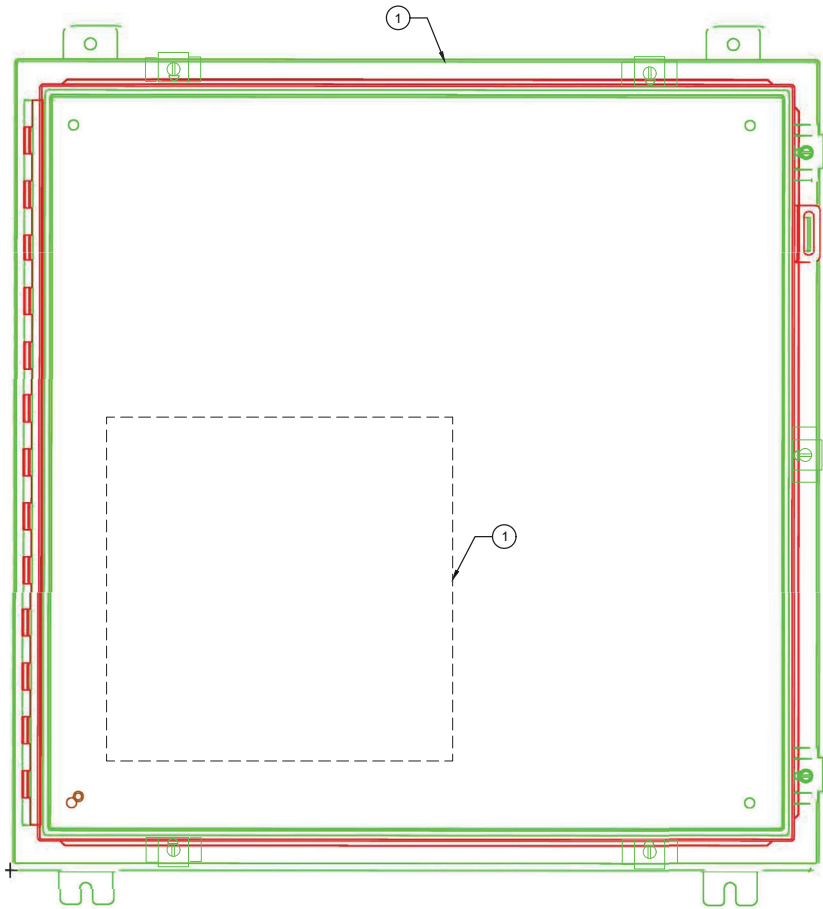
PRV CHAMBER
ELECTRICAL LAYOUT

Sheet No.

E-02



BACKPAN LAYOUT



FRONT LAYOUT

- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - PANEL SIZE AND LAYOUT ARE FOR ILLUSTRATION PURPOSES ONLY. PANEL SHOP SHALL SIZE THE PANEL WITH AMPLE WORKING SPACE AROUND THE COMPONENTS. PANEL LAYOUT SHOULD BE OPTIMIZED FOR EASE OF PANEL AND FIELD WIRING.
 - PROVIDE OVERSIZED PANDUITS. INTERNAL PANEL WIRING SHALL TAKE UP TO 50% SPACE IN EACH PANDUIT.
 - ALL EQUIPMENT SHALL BE CSA APPROVED AND MUST BEAR THE SEAL OF APPROVAL.
 - PANEL DOOR SHALL BE BONDED TO THE FRAME. PANEL MUST BE EQUIPPED WITH AN ADDITIONAL SCREW TYPE LUG SUITABLE FOR A #2AWG GROUNDING CONDUCTOR.
 - ALL TERMINAL BLOCKS SHALL HAVE 20% SPARE TERMINALS.
 - MATERIAL LISTED IN THE BILL OF MATERIALS IN THIS DRAWING ARE NOT INCLUSIVE OF ALL THE MATERIAL IN THE SCOPE OF WORK. CONTRACTOR SHALL EXAMINE THE FULL DRAWING SET FOR A COMPLETE LIST OF MATERIALS.
 - CONTRACTOR SHALL SUPPLY AND INSTALL A FULLY PROGRAMMED SCADAPACK32 RTU MODULE AS SPARE.

ITEM	TAG	QTY	PART NUMBER	DESCRIPTION	MANUFACTURER	ITEM	TAG	QTY	PART NUMBER	DESCRIPTION	MANUFACTURER
1	CP-001	1	A###H####SS6LP	ENCLOSURE, NEMA 4X, 762X762X203 MINIMUM C/W BACK PANEL AND DATA POCKET	HOFFMAN	51		2		SCADAPACK 32 P4, INTEGRATED 5601A I/O BOARD (NOTE 8)	SCHNEIDER ELECTRIC
2						52					
3		1	LED24V15	LED ENCLOSURE LIGHT C/W LDSWITCH72 AND LED24VCORD	HOFFMAN	53					
4		1	ALFSWD	CP-1 DOOR SWITCH	HOFFMAN	54					
5						55		1		ISOLATED GROUND BAR C/W 6 LUGS	
6						56					
7						57					
8						58					
9						59					
10						60					
11						61					
12						62					
13						63					
14						64					
15	UPS-001			1500VA, 120VAC UNINTERRUPTIBLE POWER SUPPLY C/W MOUNTING BRACKETS, EATON POWERWAVE 9130	EATON	65		AS REQ.	1492-MCAA115	CIRCUIT BREAKER, PRIMARY, 15A	ALLEN BRADLEY
16						66		AS REQ.	1492-MCAA110	CIRCUIT BREAKER, PRIMARY, 10A	ALLEN BRADLEY
17						67		AS REQ.	1492-SP1B050	CIRCUIT BREAKER, SUPPLEMENTARY, 5A	ALLEN BRADLEY
18						68		AS REQ.	1492-SP1B020	CIRCUIT BREAKER, SUPPLEMENTARY, 2A	ALLEN BRADLEY
19						69					
20		AS REQ.	1020100000	TERMINAL BLOCK, WDU 4	WEIDMULLER	70		AS REQ.		WIRING DUCT, WIDTH AND HEIGHT TO FIT, NARROW SLOT, GRAY	PANDUIT
21		AS REQ.	1010100000	GROUND TERMINAL BLOCK, GREEN YELLOW, WPE 4	WEIDMULLER	71					
22		AS REQ.	1061200000	TERMINAL BLOCK END BRACKET, WEW 35/2	WEIDMULLER	72	CRUPS	1	100C16D200	CONTACTOR, 110VAC, 16A, 4 POLE	ALLEN BRADLEY
23		AS REQ.	1806120000	TERMINAL BLOCK END BRACKET MARKER, EM 8/30	WEIDMULLER	73	CRUPS	1	100-FA11	100-C AUXILIARY CONTACT BLOCK, FRONT MOUNTING	ALLEN BRADLEY
24		AS REQ.	1909020000	PLUG IN JUMPER, 20 POLE, YELLOW, FOR WDU 4	WEIDMULLER	74					
25						75	REC-002	1		DUPLEX RECEPTACLE (SEE DRAWING E-12 NOTE 1)	
26		AS REQ.	1880410000	FUSED TERMINAL BLOCK, 10-60V AC/DC, LED INDICATOR, WSI 4/2/LD	WEIDMULLER	76					
27		AS REQ.	1880450000	FUSED TERMINAL BLOCK END PLATE, WAP WSI 4/2	WEIDMULLER	77					
28		AS REQ.	AGC-2	FUSE, 2A (INCLUDES 20 SPARES)	BUSSMAN	78					
29		AS REQ.	AGC-4	FUSE, 4A (INCLUDES 20 SPARES)	BUSSMAN	79					
30		AS REQ.	1022300000	TERMINAL BLOCK, TWO LEVEL, SCREW CLAMPS, TOP AND BOTTOM LEVELS CONNECTED, WDK2.5V	WEIDMULLER	80					
31		AS REQ.	1041100000	DI TERMINAL BLOCK, TWO LEVEL, SCREW CLAMPS, WDK 2.5 ZQV	WEIDMULLER	81					
32		AS REQ.	1059100000	END PLATE FOR DI TERMINAL BLOCK, TWO LEVEL, WDK 2.5 ZQV	WEIDMULLER	82					
33		AS REQ.	1909000000	PLUG IN JUMPERS, 20-POLE, FOR WDK 2.5 ZQV	WEIDMULLER	83					
34						84					
35		AS REQ.	9532440000	AI TERMINAL BLOCK, TWO LEVEL FUSED, SCREW CLAMPS, KDKS 1/35 DB	WEIDMULLER	85	PS-001	1	2904601	24 VDC POWER SUPPLY, QUINT4-PS/1AC/24DC/10, 10A OUTPUT	PHOENIX CONTACT
36		AS REQ.	9532470000	END PLATE FOR AI TERMINAL BLOCK, TWO LEVEL FUSED, SCREW CLAMPS, KDKS 1/35 DB	WEIDMULLER	86		2		12VDC PURE LEAD BATTERY PACK	
37		AS REQ.	GMA-500-R	FUSE, 0.5A, FAST ACTING, FOR AI FUSED TERMINALS (INCLUDES 20 SPARES)	BUSSMAN	87					
38		AS REQ.	1609900000	AI TERMINAL BLOCK MARKER FOR KDKS 1/35 DB	WEIDMULLER	88					
39						89		AS REQ.	700-HN153	700-HB RELAY BASE	ALLEN BRADLEY
40						90		AS REQ.	700-HB33A1-4	RELAY, 120VAC COIL, 3PDT, 15A CONTACT RATING, LED STATUS INDICATION	ALLEN BRADLEY
41						91		AS REQ.	700-HB33Z24-4	RELAY, 24VDC COIL, 3PDT, 15A CONTACT RATING, LED STATUS INDICATION	ALLEN BRADLEY
42						92		AS REQ.	8967350000	RELAY & BASE, 24VDC COIL, 3PDT, 6A CONTACT RATING, LED STATUS INDICATION	WEIDMULLER
43		AS REQ.	1609900000	W SERIES TERMINAL BLOCK MARKER, WS 12/6 MC, 12mm LENGTH, WHITE	WEIDMULLER	93		AS REQ.	1909120000	PLUG IN CROSS CONNECTION FOR DO RELAYS	WEIDMULLER
44						94					
45						95		1	SN-6901-AM	CELLULAR ROUTER	RED LION
46						96	ANT-001	1	ANT-G30B108111	CELLULAR ANTENNA	RED LION
47						97					
48		1	7914760001	DIN RAIL MOUNT SPARE FUSE DRAWER	WEIDMULLER	98					
49		2	PK9GTACP	GROUND BAR, COPPER, 9 TERMINALS	SQUARE D	99		AS REQ	PSHT-250-175-WT	HEAT SHRINK WIRE LABELS, PERMASLEEVE, 1.765"W x 0.439"H	BRADY
50		2	04154-02	STANDOFF, HEXAGONAL, RED, 25.4mm HIGH, 12-24 UNC x .375" LONG EXTERNAL STUD	TELECT	100					

BILL OF MATERIALS



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Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER
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Project Manager	C.BAECHLER	Date	Jul. 12, 19
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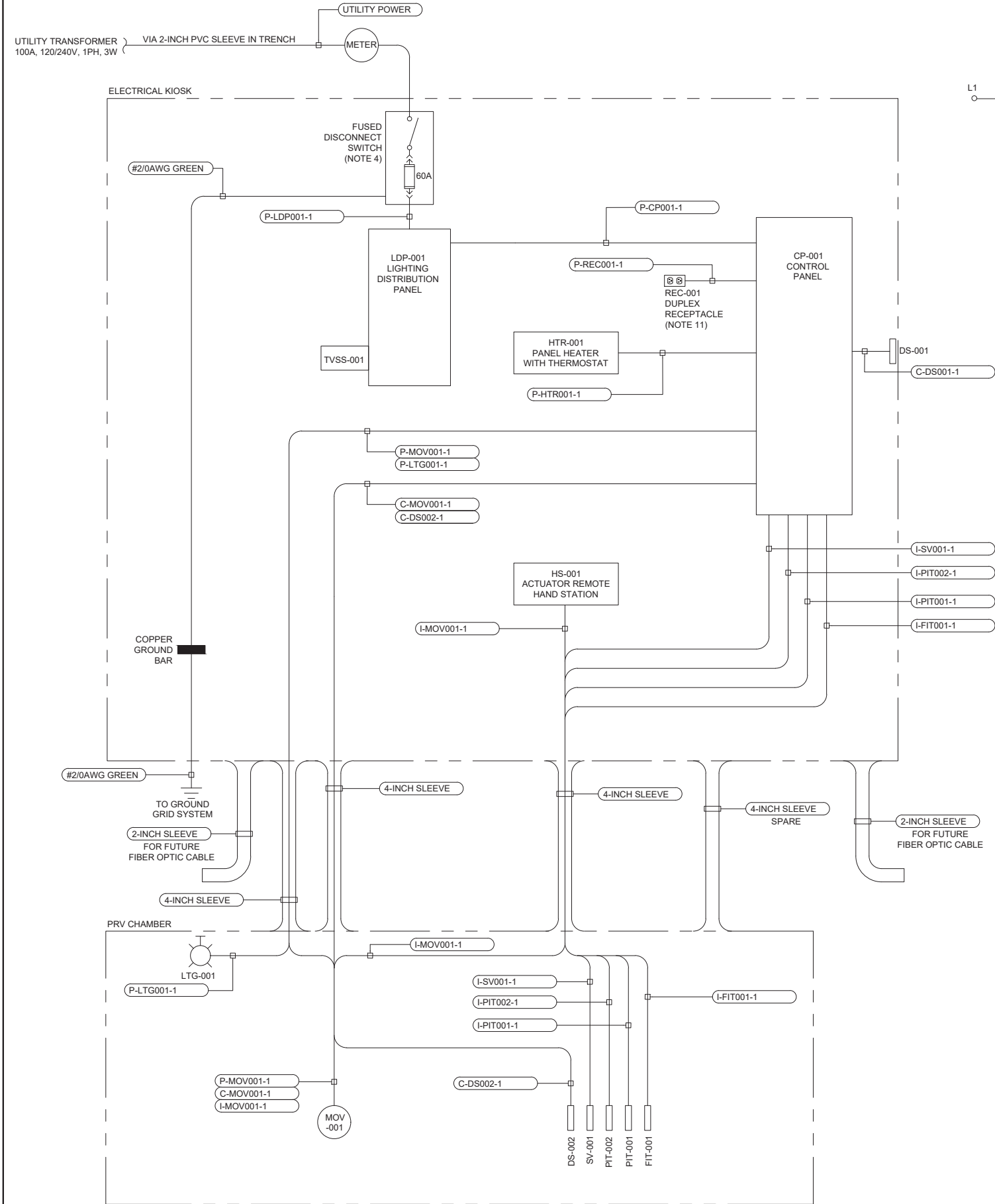
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Project No. 11181229-02(004)

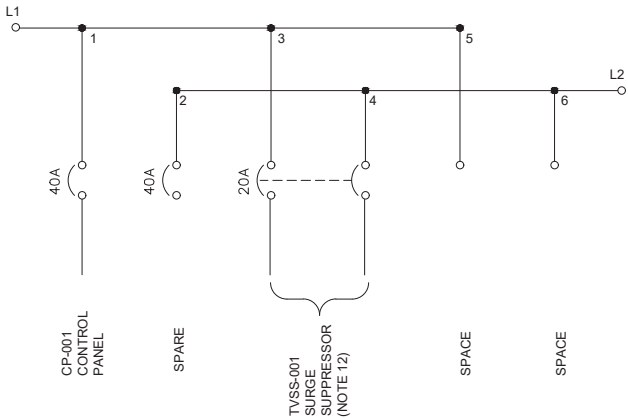
Title
**CP-001
CONTROL PANEL LAYOUT
AND BILL OF MATERIALS**

Sheet No.

E-05



LDP-001 SQUARE D CQO612L100/GN/R/CU
LIGHTING DISTRIBUTION PANEL SCHEDULE
120/240V, 100A, 1PH, 3W
6 CCT



NOTES:

- THE ELECTRICAL KIOSK ENCLOSURE SHALL BE FREE STANDING, RATED NEMA 4X AND MADE OF 316 RATED STAINLESS STEEL. THIS ENCLOSURE SHALL BE SIZED TO SUIT AND CONSTRUCTED WITH AMPLE WORKING SPACE AROUND INDIVIDUAL EQUIPMENT. KIOSK BACKPAN SHALL HAVE 20% SPARE SPACE FOR FUTURE EQUIPMENT INSTALLATIONS SUCH AS FIBER/ETHERNET SWITCH. ALL PANDUCTS SHALL BE OVERSIZED. KIOSK SHALL BE EQUIPPED WITH VENTILATION LOUVERS ON BOTH SIDES C/W FILTERS. LOUVERS SHALL BE CONSTRUCTED IN SUCH A WAY TO PREVENT INGRESS OF WATER AND INSECTS. CONTRACTOR SHALL PROVIDE PANEL SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION.
- ALL EQUIPMENT AND ENCLOSURES INSIDE THE ELECTRICAL KIOSK MUST BE DAISY-CHAIN BONDED TO THE FUSED DISCONNECT SWITCH USING SCREW TYPE GROUNDING LUGS AND #2AWG GREEN GROUND CONDUCTOR.
- SITE CONTRACTOR SHALL SUPPLY AND INSTALL A #2/0AWG GREEN GROUND CONDUCTOR BONDING THE GROUND BAR IN FUSED DISCONNECT SWITCH TO THE COPPER GROUND BAR SUPPLIED AND INSTALLED IN THE ELECTRICAL KIOSK. SITE CONTRACTOR SHALL SUPPLY AND INSTALL A #2/0AWG GREEN GROUND CONDUCTOR BONDING THE GROUND BAR IN THE ELECTRICAL KIOSK TO THE EXTERIOR GROUND GRID SYSTEM. SUPPLY AND INSTALL ALL LUGS AS NECESSARY.
- A NEMA 3R SERVICE-ENTRANCE RATED FUSED DISCONNECT SWITCH. INSTALLATION, NEUTRAL BONDING AND GROUNDING MUST ADHERE TO UTILITY STANDARDS.
- ALL CONDUIT OR CABLE ENTRIES INTO THE ELECTRICAL KIOSK MUST BE BOTTOM ENTRY.
- ALL PENETRATIONS INTO THE ELECTRICAL KIOSK SHALL BE WEATHERPROOF SEALED. THE ELECTRICAL KIOSK MUST REMAIN RODENT-PROOF UPON COMPLETION OF WORK.
- ALL SLEEVES SHALL BE SCHEDULE 40 RIGID PVC. CONTRACTOR SHALL RUN A GREEN GROUND WIRE CONDUCTOR IN EACH CONDUIT/SLEEVE SIZED AS PER THE CANADIAN ELECTRICAL CODE.
- ALL CABLES RUN INSIDE THE PRV CHAMBER SHALL EITHER RUN IN CHANNEL TRAYS OR SURFACE MOUNTED AND ADEQUATELY SUPPORTED USING UNISTRUTS AND CABLE CLAMPS.
- INSIDE THE PRV CHAMBER, ALL GREEN GROUND CONDUCTORS IN PVC SLEEVES SHALL BE DAISY-CHAIN BONDING USING COMPRESSION LUGS. MOV-001 AND LTG-001 GROUND TERMINALS SHALL BE DAISY-CHAIN BONDED TO THE GROUND GRID VIA #2AWG GREEN GROUND CONDUCTORS USING COMPRESSION LUGS. ALL INSTRUMENTS AND OTHER ELECTRICAL EQUIPMENT SHALL BE BONDED AS PER MANUFACTURER'S RECOMMENDED GUIDELINES.
- ALL WIRING TERMINATIONS SHALL BE ON TERMINAL BLOCKS. NO SPLICING PERMITTED.
- INDUSTRIAL GRADE NEMA 5-20R DUPLEX RECEPTACLE (GFCI/AFCI) C/W STAINLESS STEEL HOUSING AND FRONT PLATE.
- CONTRACTOR SHALL SUPPLY AND INSTALL A AEGIS AG-PH-240-20 SURGE PROTECTOR.
- HTR-001 PANEL HEATER SHALL BE SIZED TO SUIT THE ELECTRICAL KIOSK.

REFERENCE DRAWINGS:

- E-05 CP-001 CONTROL PANEL LAYOUT
- E-11 MOV-001 VALVE ACTUATOR WIRING DIAGRAM
- E-12 CP-001 CONTROL PANEL POWER DISTRIBUTION DIAGRAM
- E-13 CP-001 CONTROL PANEL MAIN RTU MODULE WIRING

CABLE AND CONDUIT SCHEDULE

TAG	FROM	TO	VIA	CABLE SIZE	NOTES	COMMENTS
UTILITY POWER	UTILITY	METER	2-INCH PVC SLEEVE	PULL ROPE	-	WIRING BY UTILITY PROVIDER
P-LDP001-1	METER	LDP-001	2-INCH EMT	3C #2AWG	2	VIA FUSED DISCONNECT SWITCH
P-TVSS001-1	LDP-001	TVSS-001	WIRES IN WIRE WAY OR SURFACE RUN	2C #10AWG	2	
P-CP001-1	LDP-001	CP-001	WIRES IN WIRE WAY OR SURFACE RUN	2C #8AWG	2	
P-REC001-1	CP-001	REC-001	WIRES IN WIRE WAY OR SURFACE RUN	2C #10AWG	2	
P-HTR001-1	CP-001	HTR-001	WIRES IN WIRE WAY OR SURFACE RUN	2C #12AWG	2	
P-MOV001-1	CP-001	MOV-001	4-INCH PVC SLEEVE	2C #12AWG	2	
P-LTG001-1	CP-001	LTG-001		2C #12AWG	2	
C-DS001-1	CP-001	DS-001	WIRES IN WIRE WAY OR SURFACE RUN	2C #14AWG	2	
C-MOV001-1	CP-001	MOV-001	4-INCH PVC SLEEVE	15C #14AWG	2	
C-DS002-1	CP-001	DS-002		2C #14AWG	2	
I-MOV001-1	HS-001	MOV-001	4-INCH PVC SLEEVE	2PR #16AWG SH	3	OR THE CABLE SUPPLIED BY ROTORK
I-PIT001-1	CP-001	PIT-001		1PR #16AWG SH	3	
I-PIT002-1	CP-001	PIT-002		1PR #16AWG SH	3	
I-FIT001-1	CP-001	FIT-001		2PR #16AWG SH	3	OR THE CABLE SUPPLIED BY CLA-VAL
I-SV001-1	CP-001	SV-001		1PR #16AWG SH	3	
T-ANT001-1	CELLULAR ROUTER	ANT-001		RG316 COAX	-	SUPPLIED WITH ANTENNA. ORDER LENGTH TO SUIT
T-ETHERNET -1	MAIN RTU MODULE	CELLULAR ROUTER		4PR #23AWG SH	4	

CABLE AND CONDUIT SCHEDULE NOTES:

- CABLE TYPES LISTED IN THE NOTES BELOW ARE FOR SURFACE-MOUNTED CABLES AND CABLES RUN IN SLEEVES. INDIVIDUAL CONDUCTORS IN WIREWAYS SHALL ADHERE TO THE WIRE RATING LISTED IN THE NOTES BELOW.
- 600V MULTICONDUCTOR TECK 90 CABLE, STRANDED BARE COPPER CONDUCTORS, RW90 XLPE INSULATION, UNINSULATED STRANDED COPPER BONDING WIRE, PVC INNER JACKET, ALUMINUM INTERLOCKED ARMOUR, AND UV-RESISTANT PVC OUTER JACKET RATED FOR -40°C TO +90°C, HL, FT4, CSA, STANDARD COLOUR CODE
- 300V MULTI-PAIR OR MULTI-TRIAD INDIVIDUALLY SHIELDED AND OVERALL SHIELDED ACIC CABLE, RW90 XLPE INSULATION, PVC INNER JACKET, ALUMINUM INTERLOCKED ARMOUR, AND UV-RESISTANT PVC OUTER JACKET RATED FOR -40°C TO +75°C, HL, FT4, CSA, STANDARD COLOUR CODE
- 300V INDUSTRIAL GRADE ARMoured ETHERNET CAT6 COMMUNICATION CABLE, STRANDED BARE COPPER CONDUCTORS, POLYPROPYLENE INSULATION, PVC INNER JACKET, TC SHIELD (INDIVIDUAL PAIR SHIELD AND OVERALL SHIELD), ALUMINUM CORRUGATED ARMOUR, AND UV-RESISTANT PVC OUTER JACKET RATED FOR -40°C TO +75°C, HL, FT4, CSA, STANDARD COLOUR CODE
- ALL GREEN GROUND CONDUCTORS SHALL BE 600V, STRANDED BARE COPPER CONDUCTOR, FR RATED RWU90 XLPE INSULATION, AND UV-RESISTANT PVC OUTER JACKET RATED FOR -40°C TO +90°C, HL, FT4, CSA.



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Client

CITY OF WHITE ROCK
BRITISH COLUMBIA

Project

EVERALL PRV STATION

3	ISSUED FOR TENDER	LG	CB	July 22, 19
2	FOR FINAL REVIEW	LG	CB	May 23, 19
1	ISSUED FOR 95% REVIEW	LG	CB	Mar. 29, 19
No.	Issue	Drawn	Approved	Date
Drawn	S.BRIGGS	Designer	A.KHALILZADEH	
Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER	
Project Manager	C.BAECHLER	Date	Jul. 19, 19	
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Original Size		Bar is 20mm on original size drawing 0  20mm		
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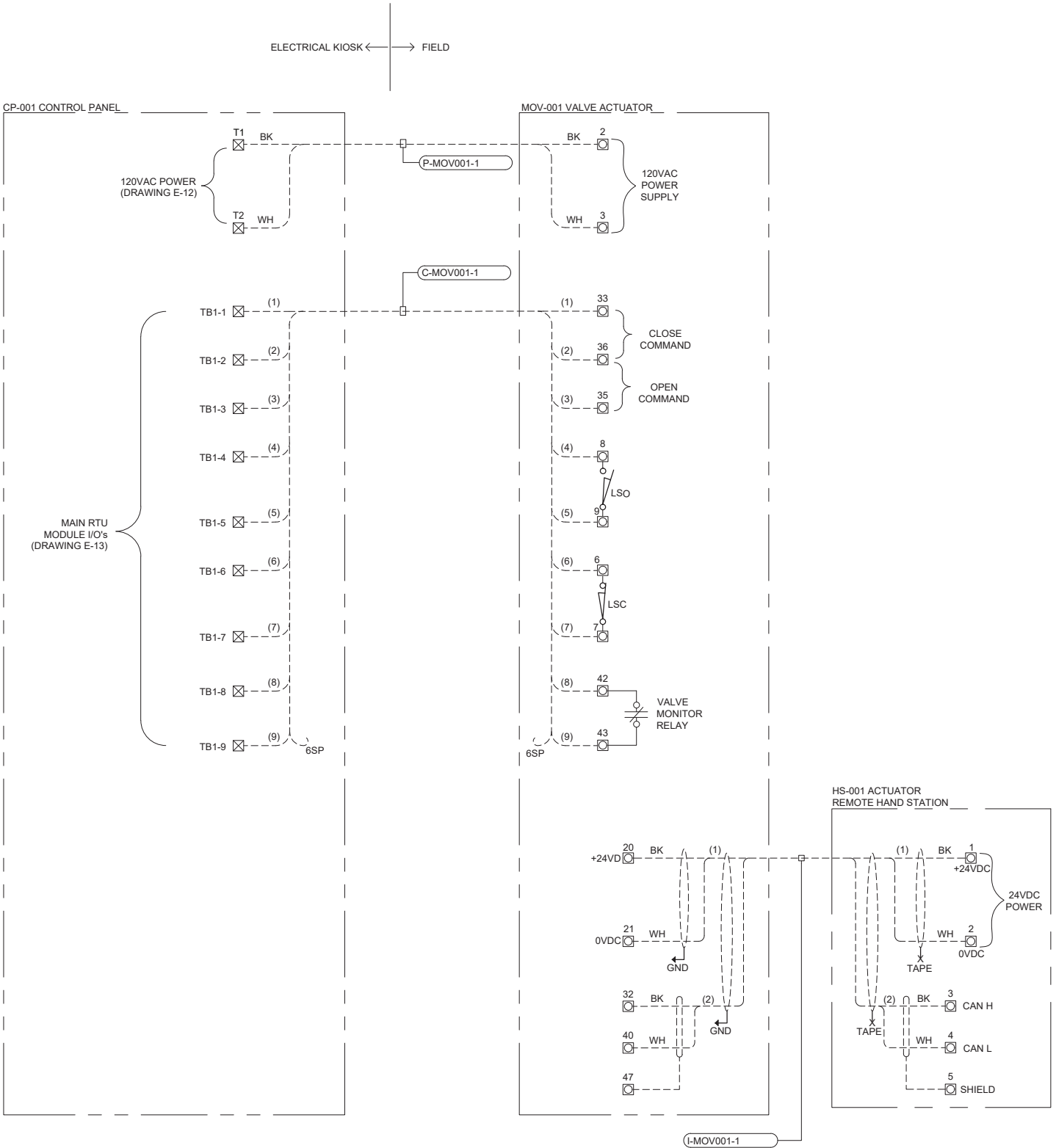
Project No.

Title

POWER DISTRIBUTION
DIAGRAM

Sheet No.

E-10



- LEGEND:
- PANEL WIRING
 - FIELD WIRING
 - PANEL TERMINAL
 - FIELD DEVICE TERMINAL
 - PANEL DEVICE TERMINAL

- NOTES:
- ALL TERMINAL BLOCKS SHALL BE SUPPLIED WITH 20% SPARE TERMINALS.

- REFERENCE DRAWINGS:
- E-10 POWER DISTRIBUTION DIAGRAM
 - E-12 CP-001 CONTROL PANEL SCHEMATIC DIAGRAM
 - E-13 CP-001 CONTROL PANEL MAIN RTU MODULE WIRING




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Drawn	S.BRIGGS	Designer	A.KHALILZADEH
Drafting Check	T.GERMSHEID	Design Check	C.BAECHLER
Project Manager	C.BAECHLER	Date	Jul. 12, 19
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Project No. 11181229-02(004)

Title
**MOV-001 VALVE ACTUATOR
WIRING DIAGRAM**

Sheet No.

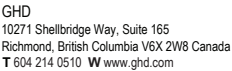
E-11



FOR LEGEND, SEE DRAWING E-11.

1. UPS DUPLEX RECEPTACLE MUST BE RED IN COLOR. INDUSTRIAL GRADE NEMA 5-15P DUPLEX RECEPTACLE (GFCI/AFCI) C/W STAINLESS STEEL HOUSING.
2. ALL TERMINAL BLOCKS SHALL BE SUPPLIED WITH 20% SPARE TERMINALS.
3. ALL CONTROL RELAYS SHALL BE SUPPLIED WITH ONE (1) SPARE N.O. AND ONE (1) SPARE N.C. CONTACTS.

1.	E-05	CP-001 CONTROL PANEL LAYOUT AND BILL OF MATERIALS
2.	E-10	POWER DISTRIBUTION DIAGRAM
3.	E-11	MOV-001 VALVE ACTUATOR WIRING DIAGRAM
4.	E-13	CP-001 CONTROL PANEL MAIN RTU MODULE WIRING



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**CITY OF WHITE ROCK
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Project Manager	C.BAECHLER	Date	Jul. 12, 19
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Original Size ANSI D		Bar is 20mm on original size drawing 	

Project No. 11181229-02(004)

Title

CP-001 CONTROL PANEL SCHEMATIC DIAGRAM

Sheet No.

E-12

APPENDIX D – HISTORICAL GEOTECHNICAL REPORTS

FINAL GEOTECHNICAL ASSESSMENT

1444 Oxford Street
White Rock, British Columbia



Prepared for:
Epcor Utilities Inc.
2000 – 10423 101 Street NW
Edmonton, AB T5H 0E8

Prepared by:
Stantec Consulting Ltd.
Metrotower 1
2400-4710 Kingsway
Burnaby, BC V5H 4M2
Tel: (604) 436-3014
Fax: (604) 436-3752

Project No.: 1117-00444

April 8, 2014

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FINAL GEOTECHNICAL ASSESSMENT

Introduction
February 4, 2014

1.0 Introduction

Stantec Consulting Limited (Stantec) has completed a geotechnical assessment for the proposed development located at 1444 Oxford Street, White Rock, British Columbia, herein referred to as the "Site". The purpose of this assessment was to characterize the subsurface soil conditions and provide geotechnical recommendations for the design and construction of the proposed water supply reservoir and pump station facility. Recommendations are provided for site preparation, foundation design, temporary excavations, and pavement design. The scope of work for the assessment comprised of a subsurface investigation, engineering analysis and preparation of this report.

2.0 Site Description

As shown on Drawing No. 1 (**Appendix B**), the Site is located approximately 300 m south from the intersection of Oxford Street and North Bluff Road, and is bounded to the west by Oxford Street, to the east by either Everall Street (north half) or private property (south half). The north is bounded by private property and the south is bounded by private property (east half) and Goggs Avenue (west half).

As shown on Drawing No. 1 (**Appendix B**), the Site consists of two rectangular areas that overlap by approximately 8 m where an existing roadway provides site access. The south west rectangular area has dimensions of approximately 80 m (east-west) by 36 m (north-south), while the north east rectangular area has dimensions of approximately 108 m (east-west) by 38 m (north-south).

An existing pump house and access road are located on the south west area, while the north east area has an existing well and service vault located near the west property line. The remaining portion of the north east area is tree covered with limited open grass covered areas.

The south west area slopes moderately from the north east corner at elevation 89 m to elevation 83 m at the south west corner of the Site. The north east area is relatively flat, with approximately half of the site at geodetic elevation 93 m to 94 m. The grade slopes gently from the midpoint towards the west, with the west end of this area at elevation 90 m.

FINAL GEOTECHNICAL ASSESSMENT

Proposed Development
February 4, 2014

3.0 Proposed Development

It is understood that Epcor Utilities Inc. (Epcor) is proposing to construct a new reservoir and pump station facility on the north east area of the Site. The proposed development would consist of a partially embedded reservoir (3.0 m below finished grade and 4.75 m above finished grade), and a one-storey building with a basement containing the pump room, genset room, and hypochlorite room located to the west of the reservoir (pump room structure).

The proposed concrete reservoir will have overall dimensions of 17 m (east-west) and 34.7 m (north-south). The adjacent pump room structure will have overall dimensions of approximately 16 m (east-west) by 28.7 m (north-south). The existing site grades will be cut in the vicinity of the proposed reservoir to create a uniform finished grade of approximately 90.85 m surrounding the reservoir and adjacent pump room structure.

The proposed development plan also includes a new access road and upgrades to the existing access road from Oxford Street. The proposed development plan also includes a provision for a future treatment plant, located east of the proposed reservoir.

4.0 Site Investigation

A geotechnical subsurface investigation was completed by Stantec on June 5, 2012. The investigation was completed while Stantec was completing a subsurface investigation for the adjacent site, also owned by Epcor, with the understanding that future works were planned for the redevelopment of the plant site facilities.

The geotechnical subsurface investigation consisted of three test holes to depths ranging between 3.05 m (10 ft.) and 10.4 m (34 ft.) below existing site grade, located as shown on Drawing No. 1 (**Appendix B**). A solid stem auger hole (TH12-01) was completed in the proposed pavement area, while two air rotary (ODEX) test holes (TH12-02 and TH12-03) with standard penetration tests (SPTs) were completed adjacent to the proposed reservoir and future treatment plant areas.

The fieldwork was carried out under the full-time inspection of a Stantec field engineer, who located the test holes, logged the soil conditions encountered, recorded the results of the SPTs, and collected soil samples for further examination and testing in our Burnaby, BC soils laboratory.

FINAL GEOTECHNICAL ASSESSMENT

Soil and Groundwater Conditions
February 4, 2014

5.0 Soil and Groundwater Conditions

5.1 SOIL CONDITIONS

Based on our site investigation, the soil conditions consisted of a thin layer of topsoil over sand and gravel fill, overlying loose to dense silty sand. The silty sand was in turn underlain by dense to very dense silty sand with some gravel, or gravelly silt and sand till, in which all test holes were terminated.

The logs of the test holes are presented in **Appendix C**, with general details regarding the soils provided below.

Topsoil

A surficial topsoil layer was encountered in all test holes, with thicknesses ranging from 50 mm to 75 mm. The topsoil is generally loose, and consists predominantly of brown sandy silt. The water content of the topsoil ranged from 39% to 45%. In addition, a native topsoil layer was encountered beneath the fill at test holes TH12-02 and TH12-03. The buried native topsoil layer was 75 mm to 125 mm in thickness and consisted of sandy gravel with some silt.

Fill

Immediately underlying the surficial topsoil layer at test holes TH12-02 and TH12-03 was a fill consisting of compact brown sandy gravel with some silt. The thickness of the fill ranged between 0.15 m to 0.7 m. The water content of the fill was 17%.

Silty Sand

Beneath the native topsoil at all test hole locations was native brown silty sand deposit. The material is loose to dense and ranged in thickness from 0.5 m to 1.5 m. The measured water content of the silty sand was 13%.

Glacial Till

Brown glacial till was encountered at depths ranging from 0.9 to 1.8 m below the existing site grades and consists of silty sand with some gravel and a trace of clay or gravelly silt and sand with trace cobbles and clay. The glacial till is dense to very dense. Standard penetration tests completed within this deposit ranged from blow counts of 62 to greater than 100. The natural water content for this material ranged from 8% to 17%. All test holes were terminated in the glacial till deposit.

5.2 GROUNDWATER CONDITIONS

At the time of the geotechnical field investigation, groundwater water was observed at depths of 7.0 m and 8.4 m below existing site grades in test holes TH12-02 and TH12-03, respectively.

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

6.0 Discussions and Recommendations

6.1 GENERAL

Based on the soil conditions encountered at the test hole locations, we consider that the proposed structures can be supported on conventional spread footings and have slab-on-grade floors, provided adequate site preparation is undertaken. Where site conditions allow, typical sloped excavations could be utilized for temporary construction slopes. Alternatively, where space is restricted, temporary shotcrete and anchor supported excavations could be utilized to facilitate construction of the subgrade structures. If required at a later date, Stantec can provide the design of the temporary excavation support for the construction of the proposed subgrade structures.

Based on the proposed finished grade of 90.85 m surrounding the reservoir, it is anticipated that permanent cut slopes or retaining walls of 2 to 3 m height on the east and north sides of the reservoir could be required.

Additional details regarding recommendations for site preparation, foundation design, temporary excavations, subgrade wall pressures, seismic considerations and pavement design are provided in the following sections of this report.

Terminology and specifications for aggregates, granular materials and asphalt pavement used in subsequent sections of this report are in accordance with the Master Municipal Construction Document (MMCD) Volume II, 2009 edition, developed jointly by the Consulting Engineers of BC, the BC Road Builders and Heavy Construction Association, and the Municipal Engineers Division of the Association of Professional Engineers and Geoscientists of BC.

6.2 SITE PREPARATION

Within the footprint of the proposed access roads, surficial and buried topsoil, vegetation, existing pavement, and fill should be removed to expose the underlying, native silty sand surface. The exposed surface should then be inspected by a qualified geotechnical engineer, and any loose or soft areas will need to be adequately compacted or sub-excavated and replaced with compacted structural fill.

Within the footprint of the subgrade structures (i.e., the reservoir and pump room structure), existing topsoil, vegetation, existing pavement should be removed. The excavation for the subgrade structures should be constructed in accordance with the recommendations in Section 6.9. The exposed surface of the excavation should then be inspected by a qualified geotechnical engineer, and any loose or soft areas will need to be adequately compacted or sub-excavated and replaced with compacted structural fill.

For sub-excavated zones, structural fill should be placed in lifts not exceeding 0.3 m in thickness and compacted to at least 100% Standard Proctor Maximum Dry Density (SPMDD) to achieve the design grades.

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

It is anticipated that excavated granular fills would be suitable for re-use as structural fill; however, the topsoil fills encountered in the site investigation would not be suitable for this purpose. Excavated topsoil fills may be suitable for re-use in non-structural areas such as landscaping areas.

It is anticipated the native soils from the subgrade structure excavation will not be suitable for re-use as subgrade wall backfill, however would be suitable as site grading fill if handled properly. If the excavated native materials are to be re-used on-site as site grading fill, this should be approached with caution. The native site soils are moisture sensitive and would soften if saturated and/or disturbed. On this basis, we recommend the earthworks be completed during extended periods of warm, dry weather.

6.3 STRUCTURAL FILL

Where filling is required at sub-excavated areas, or to bring the site to design grade, structural fill should consist of pre-approved, engineered 75 mm (3 inch) minus pit run sand and gravel (MMCD, Section 31 05 17, Item 2.3). Structural fill should be placed in maximum 300 mm lifts and compacted to at least 100% Standard Proctor Maximum Dry Density (SPMDD) within building areas and pavement areas.

6.4 FOUNDATIONS

The proposed subgrade structures can be supported on conventional spread footings founded on the native till or on structural fill on the native till. Pad and strip footings founded on the native till or on structural fill on the native till should be designed for a Serviceability Limit States design (SLS) bearing resistance of 200 kPa. Stantec recommends a factored Ultimate Limit States (ULS) bearing resistance of 300 kPa for pad and strip footings founded on the dense native glacial till deposit. The factored ULS bearing resistance includes a geotechnical resistance factor of 0.5.

Strip and pad footings should have minimum widths of 450 mm and 900 mm, respectively. All exterior footings in permanently heated buildings should be founded at least 450 mm below finished exterior grade for frost protection.

For foundations designed as discussed above, and site preparation completed as recommended in Section 6.2, Stantec estimates that total post-construction settlement would be less than 25 mm under the SLS condition, and corresponding differential settlements would not exceed 15 mm over a distance of 12.5 m.

6.5 SLAB-ON-GRADE

The floors of the proposed structures can be constructed as a conventional slabs-on-grade.

It is understood that the subgrade slab-on-grade for the pump room structure and reservoir will not be underlain by an under-slab drainage system and therefore should be designed to resist groundwater uplift pressure. The slab-on-grade should be supported with a minimum 150 mm

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

thick slab base course comprising 19 mm minus crushed gravel (MMCD, Section 31 05 17, Item 2.10). The slab base course should be compacted to a minimum of 100% SPMDD.

6.6 EARTHQUAKE CONSIDERATIONS

The 2010 NBCC seismic design procedures are based on ground motion parameters having a 2% probability of exceedance in 50 years (i.e., the 2,475 year return period earthquake event). The design PGA for the City of White Rock is 0.57g (g = acceleration due to gravity), for “very dense soils”.

For the soil deposits encountered at the subject site, it is appropriate to classify the seismic site response as Site Class “C”, corresponding to “very dense” soils, in accordance with the *2012 BC Building Code*.

While some damage to the building would be expected under the influence of the 2010 NBCC design earthquake event, it is not anticipated that collapse of the proposed building addition due to foundation failure would occur, thus the intent of the *2012 BC Building Code* would be met.

The spectral acceleration values for White Rock for a site with a Site Class C designation are summarized in Table 6.1.

Table 6.1 Spectral Acceleration Values for White Rock, BC; Site Class C

S_a (0.2)	S_a(0.5)	S_a(1.0)	S_a(2.0)
1.1	0.76	0.35	0.18

6.7 SUBGRADE WALLS AND RETAINING WALLS

Preliminary design drawings indicate that subgrade portion of the reservoir walls and the basement wall for pump room structure will be up to 3.9 m in height while retaining structures may be required to accommodate the new access road through the south west area of the site.

Estimates of the lateral earth pressure coefficients for use in the design of the subgrade walls for the reservoir and for potential concrete retaining walls are provided in Table 6.2. For design, retaining walls can be considered to be unrestrained, thus the coefficient of active earth pressure (K_a) can be used for computation of the driving forces.

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

Table 6.2 Reinforced Concrete Retaining and Subgrade Wall Design Parameters

Parameters	Granular Backfill
Unit Weight of compacted granular backfill (kN/m ³)	21
Angle of Internal Friction for native till soil/compacted granular backfill ϕ	38°
Coefficient of Active Earth Pressure, K_a	0.24
Coefficient of Passive Earth Pressure, K_p	4.20
Coefficient of Earth Pressure at Rest, K_o	0.38
Coefficient of dynamic lateral earth pressure, K_{AE}	0.74
Unfactored Coefficient of Friction (between cast-in-place concrete and compacted granular fill)	0.45

The proposed subgrade structures should be designed to resist static lateral soil pressures from compacted backfill and dynamic lateral pressures induced by seismic activity. Due to the rigidity of the proposed concrete subgrade structures and the restraining influence of the concrete top, it is recommended that the embedded walls be designed for static earth pressures assuming an "at rest" pressure distribution over the full height of the embedded wall, where K_o is the "at rest" earth pressure coefficient, which should be assumed to have a value of 0.38.

For a depth of up to approximately 2.5 m, the static lateral soil pressure should be designed for a uniform pressure of 20 kPa, resulting from stresses from compaction of the granular backfill. At depths exceeding 2.5 m, it is sufficient to assume that the static lateral soil pressure increases linearly with depth.

During the 2010 NBCC design earthquake, it anticipated that the subgrade wall-soil horizontal movement would exceed 0.5% of the wall height (i.e., approximately 40 mm) due to the high peak ground acceleration design level (0.57g for very dense soil conditions in White Rock, BC) and the effects of soil structure interaction. Therefore, it is considered that seismic earth pressure predicted using the Mononobe-Okabe (active) earth pressure theory is applicable, as opposed to the non-yielding wall theory. Based on the Mononobe-Okabe approach, the dynamic force exerted on the wall by the soil mass is given by the following equation:

$$P_{AE} = \frac{1}{2} \gamma H^2 K_{AE}$$

where:

H is the height of the subgrade concrete reservoir structure.

It should be noted that the seismic active earthquake pressure does not act in addition to static "at rest" earth pressure. It is sufficient to assume that the active seismic pressure acts as a uniform distribution, with the resultant of the seismic active earth pressure located at the mid-height of the wall. It is recommended that the dynamic lateral pressure be calculated with a seismic active earth pressure coefficient (K_{AE}) of 0.74.

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

The recommended static (which include stresses from compaction) and seismic lateral earth pressure distributions against the walls of the proposed concrete chambers are presented in written and diagrammatic form in Table 6.3 and on Drawing 2 (**Appendix B**), respectively.

Table 6.3 Design Lateral Forces for Subgrade Structures

Description	Lateral Force (KN/m)
Static soil force and force from compaction	$20 \times 2.5 + 0.5K_o D^2 \gamma$
Seismic force	$0.5 \gamma H^2 * K_{AE}$

WHERE:

D = Depth greater than 2.5 m (i.e., H-2.5 m)

H = Height of subgrade structure (m)

γ = Unit weight of soil backfill 21 KN/m³

It is recommended that positive drainage be provided to prevent the build-up of hydrostatic pressure behind all subgrade walls and retaining walls. Otherwise, full hydrostatic pressures will be required for the computation of the lateral loads.

6.8 PERMANENT DRAINAGE

Groundwater was identified in the test holes at elevations both just above and just below that of the proposed foundation elevation for the reservoir and pipe gallery. The groundwater encountered is likely perched and not representative of the permanent groundwater level.

Stantec understands that a perimeter drainage system will be installed for the proposed subgrade structures. Currently, two levels of piping are anticipated to be installed. One at an approximate depth of 1.2 m below finished grade, and the other at a depth of approximately 3.5 m below finished grade (just above the base of the reservoir foundations).

It is recommended that the perimeter drainage system, consist of at least 150 mm diameter slotted or perforated rigid wall pipe. The drainage pipes should be surrounded by a minimum of 300 mm of 25 mm drain rock or 25 mm clear crush gravel (MMCD, Section 31 05 17, Item 2.6) encapsulated in filter fabric. In addition, a 450 mm wide chimney drain consisting of drain-rock or free-draining sand should be provided next to subgrade walls. The perforated pipe should be installed with perforations at 60 degrees off the base of the pipe. Perimeter drains should be provided with permanent clean-outs. Note that "Big O" type pipe is not considered to be suitable for building drainage purposes.

The perimeter drainage system should be designed to direct water by gravity flow into a permanent storm water drain or collector sump. The roof and surface runoff should be collected and directed to a storm sewer in a solid-wall pipe, separate from the perimeter drainage. Final

FINAL GEOTECHNICAL ASSESSMENT

Discussions and Recommendations
February 4, 2014

ground surfaces around the structure should be graded to direct surface runoff away from building areas.

6.9 EXCAVATIONS AND GROUNDWATER CONSIDERATIONS

Excavation for the proposed subgrade structures should extend at full depth to 1 m beyond the outside of the perimeter walls to allow sufficient room for construction perimeter footings and 0.3 m below the underside of slab elevation to allow room for the slab-on-grade drainage layer.

If tree removal surrounding the proposed structures is allowed, the excavation can be completed with 1H : 1V (horizontal : vertical) slopes around all sides with polyethylene sheeting secured to the slopes with weldmesh to prevent erosion within the excavation slopes. If tree removal or other site restraints will not permit a sloped excavation, a vertical excavation could be utilized. A vertical excavation would require the implementation of shotcrete and tie-back anchor shoring. If required at a later date, Stantec can provide the design of temporary excavation support for the construction of the proposed subgrade structures.

Groundwater was encountered above the base of the proposed excavation in the test hole located adjacent to the southwest corner of the proposed reservoir (TH12-02). This condition is likely representative of perched groundwater conditions. It is anticipated that any groundwater seepage into the excavation, if encountered, can be controlled using sumps and pumps.

The native till deposits are competent to sustain near-vertical unsupported excavated cuts for utility trenches and foundations up to a maximum depth of 1.2 m. Deeper temporary trenches in the native till or trenches excavated in the existing site fill should be sloped no steeper than 1H:1V. All excavations should be carried out in accordance with the Work Safe BC, and reviewed on a regular basis, during and before worker entry.

Excavated material should be stockpiled no closer than 2 m from the crest of the excavation slopes. Equipment should also be kept a minimum of 2 m from the crest of excavations.

Permanent cut slopes required to achieve final design grades should be sloped at 2H:1V. Permanent cut slopes should be vegetated to provide to reduce long-term soil loss from erosion.

FINAL GEOTECHNICAL ASSESSMENT

Construction Field Reviews
February 4, 2014

6.10 PAVEMENT DESIGN

It is assumed that the access roads and parking areas will be used primarily by passenger vehicles. For the subgrade prepared as described in Section 6.2, the minimum pavement sections listed in 4 should be used.

Table 6.4 Recommended Minimum Pavement Section

Layer	Access Roads and Parking Areas
Asphalt	65 mm
19 mm Crushed Gravel Base (MMCD, Section 31 05 17, Item 2.10)	100 mm
75 mm minus Pit Run Gravel (subbase) (MMCD, Section 31 05 17, Item 2.8)	200 mm

The pavement surface and the underlying subgrade should be graded to direct runoff water towards suitable drainage. All granular materials should conform to the current Master Municipal Construction Document, and should be tested and approved by a Stantec field inspector prior to delivery to the site. The gravel base and pit-run subbase materials should be compacted to at least 100% SPMDD. Asphalt should be compacted to at least 97% of the 50-blow Marshall density.

7.0 Construction Field Reviews

Stantec should be retained to provide part-time field review during construction in order to verify that the soil conditions encountered are consistent with our design assumptions and that the intent of our recommendations is being met. The field and engineering review as outlined below will fulfill the obligations specified in the Letters of Assurance as required by the City of White Rock.

- Inspection of subgrade soil within building, pavement areas
- Density testing to verify compaction of site grading fills, where required
- Verification soil bearing at footing locations
- Density testing to verify compaction below slab-on-grade
- Inspection of excavation cut slopes and shoring
- Verification of subgrade in pavement areas
- Density testing to verify compaction of pavement areas subbase and base materials

FINAL GEOTECHNICAL ASSESSMENT

Closure
February 4, 2014

8.0 Closure

This report was prepared for the exclusive use of Epcor Utilities Inc. and their agents. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved in writing by Stantec.

The recommendations contained in this report are based on assumed continuity of soils with those of our test holes, and assumed structural loads. Stantec should be provided with final architectural and structural drawings when they become available in order that we may review our design recommendations and advise of any revisions, if necessary.

Use of this report is subject to the Statement of General Conditions provided in **Appendix A**. It is the responsibility of Epcor Utilities Inc., who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied. The Statement of General Conditions addresses the following:

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

FINAL GEOTECHNICAL ASSESSMENT

Closure
February 4, 2014

This report has been prepared by Joel Pineau, P.Eng. and reviewed by Wayne Quong, P.Eng. We trust the above information meets your present requirements. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Regards,

Stantec Consulting Ltd.

Original signed by

Joel Pineau, P.Eng.
Geotechnical Engineer
Joel.Pineau@stantec.com

JP/WQ/bd

Original signed by

Wayne Quong, M.A.Sc., P.Eng.
Senior Associate
Wayne.Quong@stantec.com

jp u:\pc 1117 surrey, bc\111700444 - epcor_detail_design\report\oxford\rpt_111700444_geotech_assessment_1444_oxford_whiterock_2014-04-08.docx

FINAL GEOTECHNICAL ASSESSMENT

Appendix A Statement of General Conditions
February 4, 2014

Appendix A Statement of General Conditions

Statement of General Conditions

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

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

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

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

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

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-surface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.

FINAL GEOTECHNICAL ASSESSMENT

Appendix B Drawings
February 4, 2014

Appendix B Drawings

U:\PC 1117 Surrey, BC\111700444 - Epcor_Detail_design\drawing\cad\figures\oxford_sife\111700444 D01 R0_oxford.dwg
2013/11/20 4:49 PM By: Huynh, Gordon

ORIGINAL SHEET - ANSI B



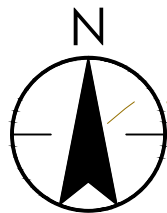
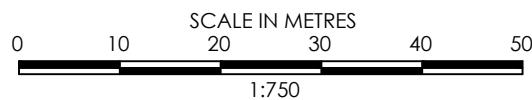
4370 Dominion Street
Burnaby, BC Canada, V5G 4L7
www.stantec.com

Legend

--- SITE PROPERTY LINE

--- CONTOUR LINE

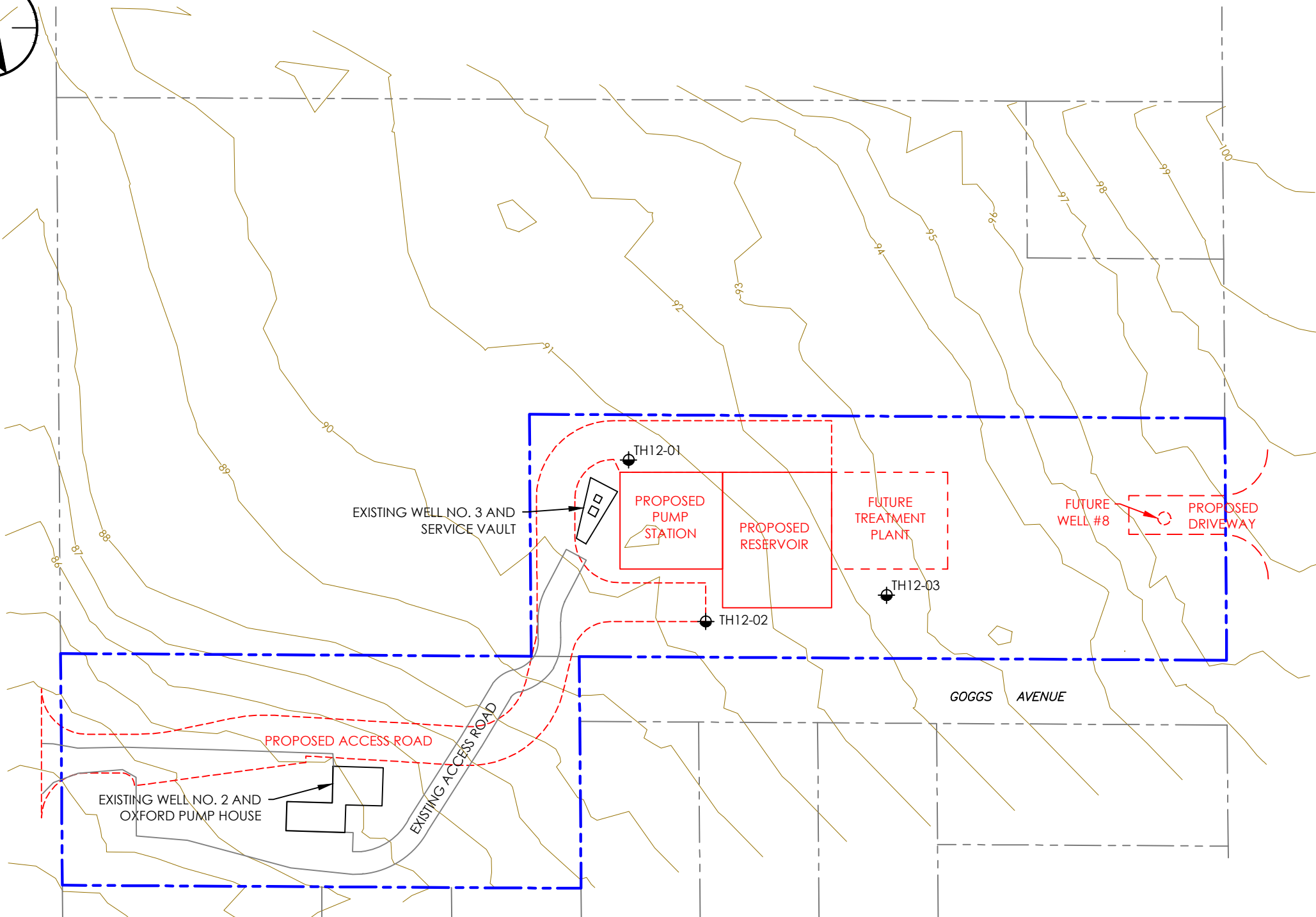
⊕ TEST HOLE LOCATION



OXFORD STREET

EVERALL STREET

GOGGS AVENUE



Client/Project

EPCOR UTILITIES INC.

GEOTECHNICAL SITE ASSESSMENT

1454 OXFORD STREET, WHITE ROCK, BC

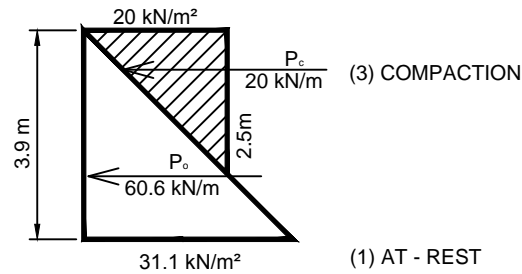
Figure No.

1

Title

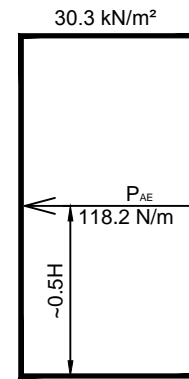
TEST HOLE LOCATION PLAN

13-Nov-19
111700444



(1) AT - REST + (3) COMPACTION

PRESSURE $p_o = \gamma HK_o$
FORCE $P_o = \text{TOTAL AREA}$



(2) DYNAMIC

$p_{AE} = p_A + \Delta p_{AE}$
 $P_{AE} = 0.5K_{AE}H^2\gamma$

- NOTES :
1. SEE TABLE 1 FOR DESIGN PARAMETERS.
 2. FOR STATIC CONDITIONS, TOTAL FORCE = (1) + (3)
 3. FOR SEISMIC CONDITIONS, TOTAL FORCE = (2)

$\gamma = \text{UNIT WEIGHT OF BACKFILL} = 21 \text{ kN/m}^3$

$K_{AE} = 0.74$

ORIGINAL SHEET - ANSI A

13-Nov-22
111700444



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Client/Project

EPCOR UTILITIES INC.
GEOTECHNICAL SITE ASSESSMENT
1454 OXFORD STREET, WHITE ROCK, BC

Figure No.

2

Title

LATERAL EARTH PRESSURE DIAGRAM
FOR SUBGRADE STRUCTURES
STATIC (NON-YIELDING) AND
DYNAMIC (YIELDING)

FINAL GEOTECHNICAL ASSESSMENT

Appendix C Test Hole Logs
February 4, 2014

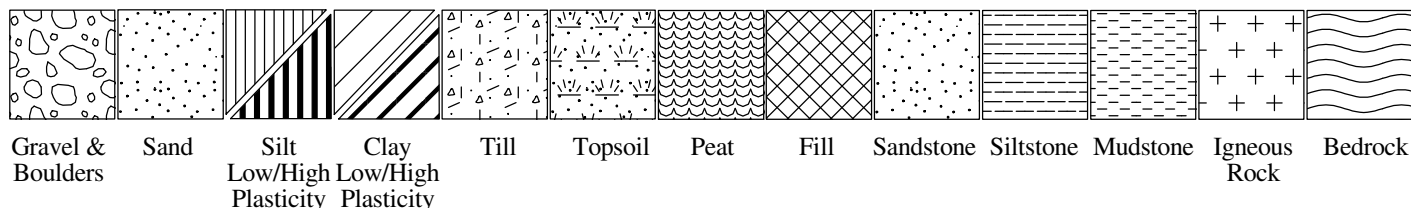
Appendix C Test Hole Logs



Stantec

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

STRATA PLOT



Initial water level reading

Long term water level reading
(date)

SOIL DESCRIPTION

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

less than 10%	Trace	20-35%	Adjective (e.g. silty or sandy)
10-20%	Some	35-50%	And (e.g. silt and sand)

The standard terminology to describe cohesionless soils includes the state of packing, as determined by laboratory test or by the Standard Penetration Test 'N' -value: the number of blows of 140 pound (64kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler one foot (305 mm) into the soil. The state of packing approximately relates to the SPT 'N' value as follows:

State of Packing	'N' Value	Relative Density %	State of Packing	'N' Value	Relative Density %
Very Loose	<4	<15	Dense	30-50	65-85
Loose	4-10	15-35	Very Dense	>50	>85
Medium Dense	10-30	35-65			

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer test, unconfined compression tests, or occasionally by standard penetration tests.

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

SAMPLES



GS... Grab Sample



RC... Rock Core



NR... No Recovery



AS... Auger Sample



ST... Shelby tube or thin wall tube



UNDIST .. Undisturbed Sample



SS... Split spoon sample
(Obtained by performing the
Standard Penetration Test)



Ps... Piston Sample

BOREHOLE RECORD

TH12-1

CLIENT EPCOR PROJECT No. 111700378
 PROJECT Geotechnical Assessment DATUM NORTHING
 LOCATION Epcor Plant Site, White Rock, BC ELEVATION EASTING
 DRILLING DATE June 5, 2012 DRILLING CO. Tervita Corporation Canada DRILLING METHOD Odex, Solid Stem

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> <input type="checkbox"/> Insitu Shear Vane (kPa) <input type="triangle-up"/> Pocket Penetrometer (kPa) </div> <div> <input checked="" type="checkbox"/> Remoulded Shear Vane (kPa) <input checked="" type="checkbox"/> Disturbed Torvane (kPa) </div> </div> <div style="text-align: center; margin-top: 5px;"> <div style="display: flex; justify-content: center; gap: 20px;"> 50kPa100kPa150kPa200kPa </div> <div style="display: flex; align-items: center; justify-content: center; gap: 10px;"> <div style="text-align: center;"> W_p ○ W_L </div> <div>Moisture Content & Atterberg Limits</div> </div> <div style="text-align: center; margin-top: 5px;"> ● Standard Penetration Test, blows/0.3m </div> </div>															DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)																
0			50mm dark brown silty SAND, some organics (Topsoil) over light brown gravelly silty SAND, compact to dense																			0
1	SM			X GS	1-1	13	○															2
2			Brown glacial TILL (gravelly Silt and Sand, trace cobbles and clay), dense to very dense	X GS	1-2	15	○															4
3	TL		-sandy clayey silt, trace gravel below, hard	X GS	1-3	17	○															6
4			End of Test Hole at 3.0m																			8
5																						10
6																						12
7																						14
																						16
																						18
																						20
																						22
																						24

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

Piezometer Backfill Type: ☒ Bentonite ☒ Sloughed ☒ Drill Cuttings ☒ Sand

Logged by: EV, RI

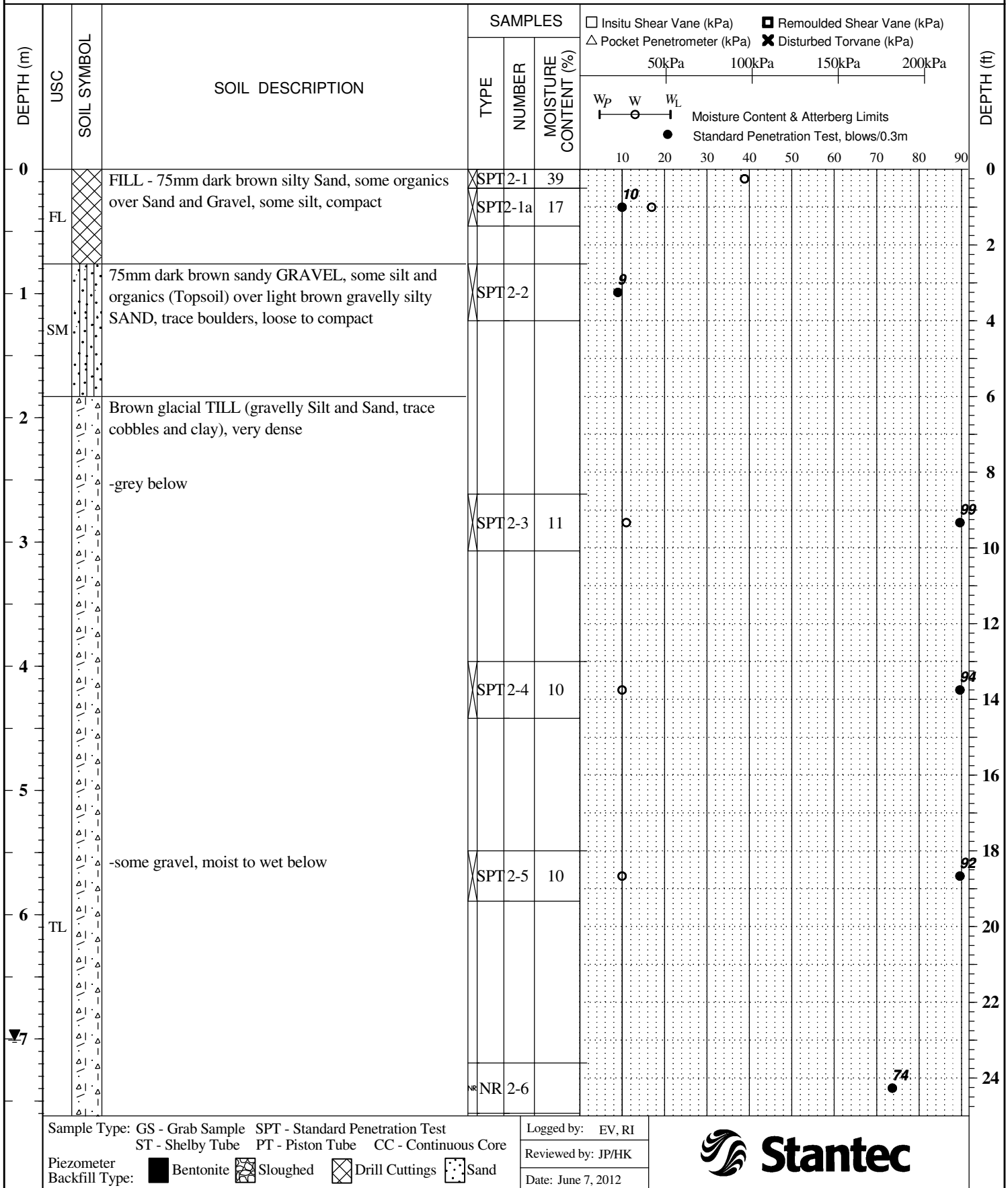
Reviewed by: JP/HK

Date: June 7, 2012

BOREHOLE RECORD

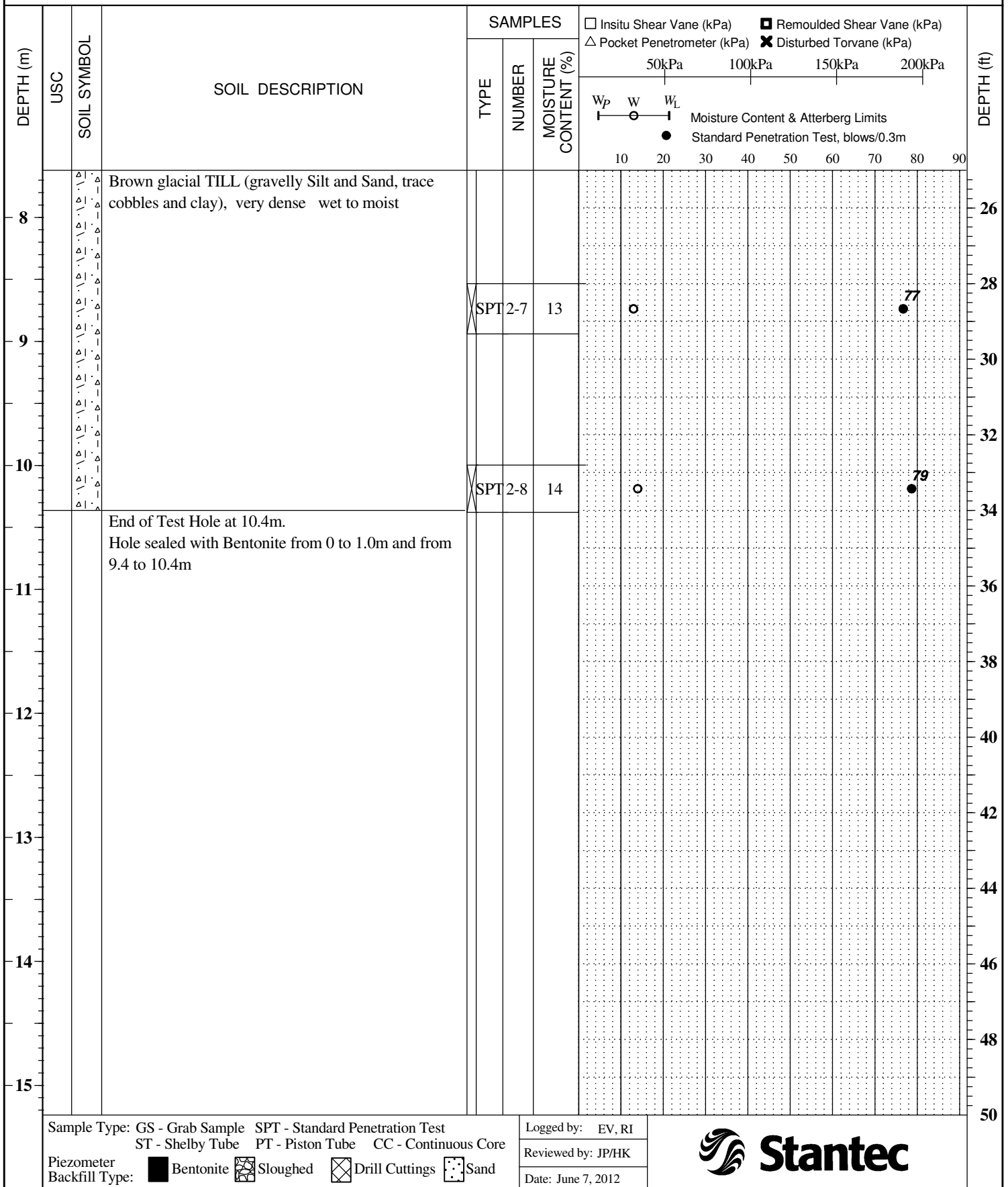
TH12-2

CLIENT EPCOR PROJECT No. 111700378
 PROJECT Geotechnical Assessment DATUM NORTHING
 LOCATION Epcor Plant Site, White Rock, BC ELEVATION EASTING
 DRILLING DATE June 5, 2012 DRILLING CO. Tervita Corporation Canada DRILLING METHOD Odex, Solid Stem



TH12-2 cont'd

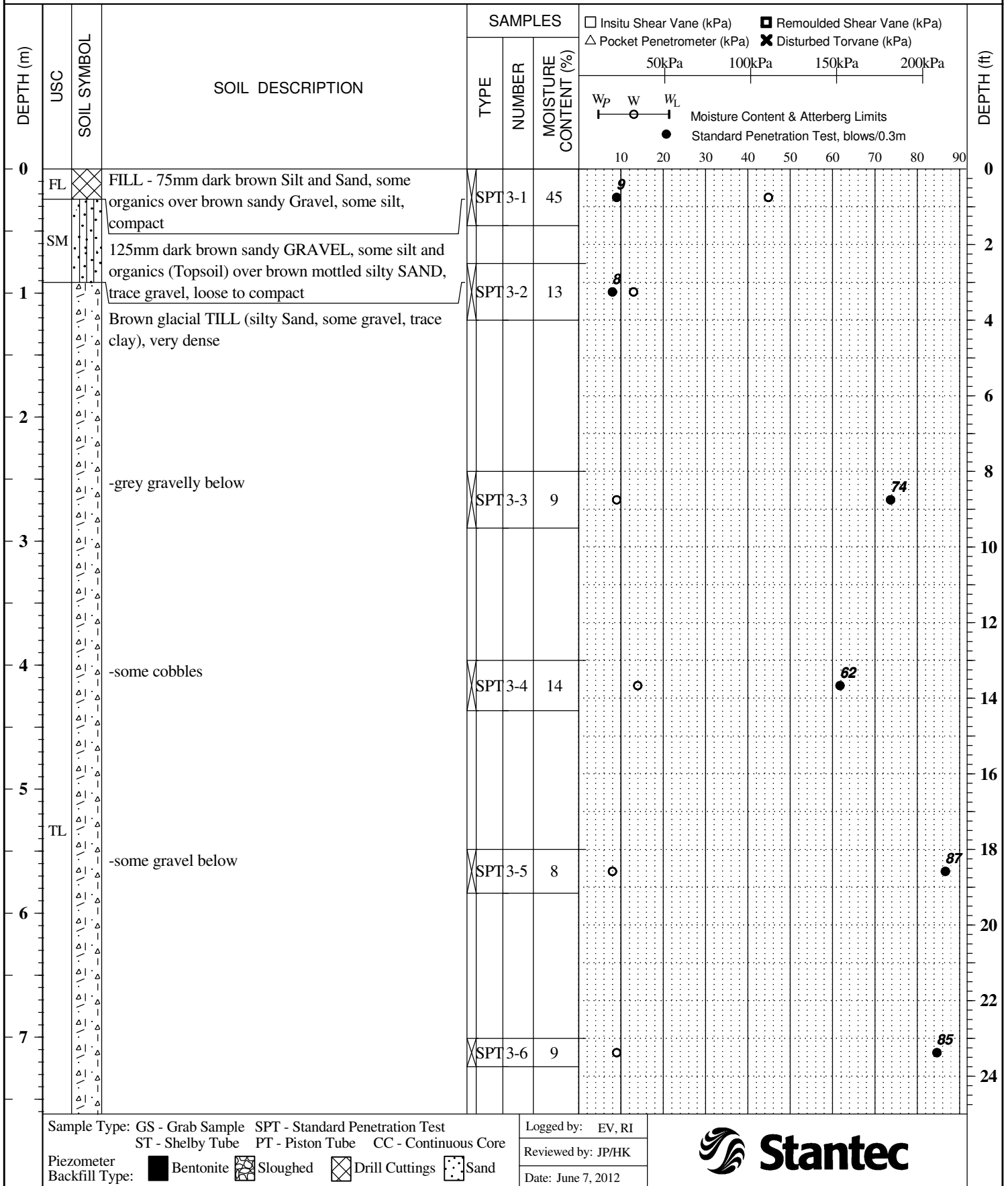
CLIENT	<u>EPCOR</u>		PROJECT No.	<u>111700378</u>
PROJECT	<u>Geotechnical Assessment</u>	DATUM	NORTHING	
LOCATION	<u>Epcor Plant Site, White Rock, BC</u>	ELEVATION	EASTING	
DRILLING DATE	<u>June 5, 2012</u>	DRILLING CO.	<u>Tervita Corporation Canada</u>	DRILLING METHOD <u>Odex, Solid Stem</u>



BOREHOLE RECORD

TH12-3

CLIENT EPCOR PROJECT No. 111700378
 PROJECT Geotechnical Assessment DATUM NORTHING
 LOCATION Epcor Plant Site, White Rock, BC ELEVATION EASTING
 DRILLING DATE June 5, 2012 DRILLING CO. Tervita Corporation Canada DRILLING METHOD Odex, Solid Stem



TH12-3 cont'd

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<div> <div> <div>□</div> <div>Insitu Shear Vane (kPa)</div> </div> <div> <div>■</div> <div>Remoulded Shear Vane (kPa)</div> </div> </div> <div> <div>△</div> <div>Pocket Penetrometer (kPa)</div> </div> <div> <div>✕</div> <div>Disturbed Torvane (kPa)</div> </div>		DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)	<div> <div>50kPa</div> <div>100kPa</div> <div>150kPa</div> <div>200kPa</div> </div> <div> <div>W_p</div> <div>W</div> <div>W_L</div> </div> <div>Moisture Content & Atterberg Limits</div> <div> <div>●</div> <div>Standard Penetration Test, blows/0.3m</div> </div>		
8		△	Brown glacial TILL (silty Sand, some gravel, trace clay), dense to very dense						26
9		△		✕ SPT	3-7	10			28
10		△		✕ SPT	3-8	12			32
10			End of Test Hole at 9.8m. Hole sealed with Bentonite from 0 to 1.0m and from 8.8 to 9.8m						34
11									36
12									40
13									42
14									46
15									48

Sample Type: GS - Grab Sample SPT - Standard Penetration Test

ST - Shelby Tube PT - Piston Tube CC - Continuous Core

Piezometer

Backfill Type:

■ Bentonite

⊠ Sloughed

⊠ Drill Cuttings

⊠ Sand

Logged by: EV, RI

Reviewed by: JP/HK

Date: June 7, 2012

Stantec



RECEIVED
MAR 19 2007

March 16, 2007
File: 1806-0803

Levelton Consultants Ltd.

150 - 12791 Clarke Place
Richmond, B.C.
Canada V6V 2H9

Tel: 604 278-1411
Fax: 604 278-1042
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300 - 1001 West Broadway
Vancouver, BC
V6H 4B1

Attention: Mr. Ken Wong

Re: Geotechnical Report
Proposed Mixed-Use Residential Development
Johnston at Thrift Avenue, White Rock, BC

1.0 INTRODUCTION

Levelton has prepared this Geotechnical Report for a proposed mixed-use residential development on Johnston Road at Thrift Avenue in White Rock, BC. The scope of work for this study is outlined in Levelton's proposal dated September 29, 2006.

This Geotechnical Report provides geotechnical recommendations for the proposed development based on results of subsurface exploration and soil testing.

The scope of this geotechnical study does not include any analysis of soil or water samples with respect to environmental concerns.

2.0 PROPOSED DEVELOPMENT

Levelton has been provided with architectural drawings for the proposed development prepared by the ABBARCH Partnership Architects. It is understood the proposed development will be constructed in two phases. Phase 1 will be comprised of 4-storey building situated over two levels of underground parking located on the western portion of the site. Phase 2 will be comprised of a 14-storey hi-rise over two to three levels of underground parking located on the eastern portion of the site.

3.0 SITE DESCRIPTION

A site plan illustrating the subject site is provided on Figure 1 attached to this report. The subject site is irregular in shaped with about 49 m of frontage on Johnston Road, 83 m on Thrift Avenue and 71 m on George Street. The property is bordered to the north by a property developed with a 2-storey building as well as parking areas.

The property is developed with several at-grade buildings and paved parking areas.

The site generally slopes gently to the southeast with about a 2.7 m grade change across the site.

4.0 SUBSURFACE SOIL CONDITIONS

The Surficial Geology map prepared by the Geological Society of Canada indicates that the site is underlain by Capilano deposits comprised of raised marine clay generally less than 10 m thick in turn underlain by Vashon Drift deposits comprised of glaciated fluvial, lacustrine and ice-contact soil deposits that extend to considerable depths.

Levelton has file information of a subsurface exploration carried out at the subject site for a previously proposed development in 2001 consisting of seven test holes (Cook Pickering & Doyle test holes AH-1 to AH-7). The approximate location of these test holes are shown on Figure 1 and test hole logs are presented in Appendix C.

For the purpose of the currently proposed development, Levelton advanced one deep test (DH-1) to about 24.8 m at the proposed hi-rise location. In addition, a further 9³ auger test holes were advanced at the approximate locations shown on Figure 1. A description of the soil conditions encountered is outlined in the soil logs in Appendix B.

Disturbed soil samples were collected at select intervals and returned to Levelton's laboratory for moisture content testing and visual classification. Penetrometer testing was carried on the soil samples collected from the auger flights to measure disturbed soil shear strength. In addition, Standard Penetration Tests (SPT's) were carried out in DH-1 to collect disturbed samples and to assess the Insitu soil density.

Based on the results of the test hole investigations, it is inferred that the subject site is generally underlain by the following soil stratigraphy:

1. **Fill:** A surficial fill was encountered by all test holes. The fill was variable in composition including silty sand, silt, sand and gravel. The fill was generally less than 1.5 m thick, except at test hole AH-3 near the south layer that encountered 3.6 m of fill.
2. **Weathered Silty Sand:** Some test holes encountered about half a meter of reddish brown silty sand deposit below the fill that is inferred to be a weathered, native soil.

3. **Stiff to Hard, Clayey Silt:** A stiff to very stiff clayey silt deposit was typically encountered by the test holes at a depth of between 0.6 m to 1.7 m. AH-3 did not encounter this deposit. The clayey silt deposit is inferred to represent the Capilano deposit of raised marine clay indicated to underlie the site by the Surficial Geology map.
4. **Till Deposits:** Below the clayey silt deposit, the test holes encountered till deposits comprised of sandy silt to silty sand with some gravel. The till deposits are inferred to be very dense based on SPT results from DH-1. This deposit is inferred to represent the glaciated Vashon Drift deposits indicated to underlie the site at depth by the Surficial Geology map. The depth to the till deposits varied from 2.4 m to 7.6 m below existing grade at the test holes. The till deposit extended to the base of DH-1 at 24.8 m depth.

A piezometer installed in DH-1 was dry when measured in February 2007 indicating that the regional groundwater table is below 24.8 m depth, the base of the piezometer. It is inferred that perched groundwater within relatively pervious layers or seams will be encountered by the parkade excavation. In addition, a near surface perched groundwater table condition likely occurs during wet weather within the fills on top of the relatively impervious clayey silt deposit.

5.0 RECOMMENDATIONS AND DISCUSSION

5.1 Foundations

Foundation level for the proposed building is estimated to be in the order of 8 m to 11 m below city grade based on the drawings provided. It is anticipated that the very dense, glacial till deposit will generally be encountered at the proposed foundation level. The very dense glacial till deposit is considered to be suitable for support of the proposed building on conventional foundations.

A serviceability limit pressure of 300 kPa for strip foundations and 400 kPa for pad foundations is judged to limit settlements to in the order of 25 mm total and 19 mm differential over 8 m. Most of the settlement will be elastic deflections that will occur rapidly as the dead load is applied during the course of construction.

For Ultimate Limit States Design under static and earthquake loading, the factored bearing resistance may be taken as 50% greater than the serviceability values outlined above.

The minimum footing dimension for the bearing resistances outlined should be 0.45 m for strip foundations and 1.5 m for pad foundations. Foundations should be located at least 0.45 m below adjacent grades for confinement.

$$\begin{aligned} 1 \text{ kPa} &= 20.8 \text{ PSF} \\ 300 \text{ kPa} &= 6,265 \text{ PSF} \\ 400 \text{ kPa} &= 8,354 \text{ PSF} \end{aligned}$$

Foundations should be located below a 2H:1V line taken up from deeper excavations for buried services, deeper foundations or other structures.

Where Phase 1 adjoins the Phase 2 building area, it is understood that separate parkade walls will be provided for each phase. The Phase 1 parkade wall will be founded up to 4m above the Phase 2 wall. Therefore, the Phase 1 parkade wall will need to be extended in the future when Phase 2 proceeds (i.e. underpinned). Alternatively, the Phase 1 parkade wall could be founded at the Phase 2 footing level if it is desired to avoid underpinning in the future.

5.2 Seismic Site Classification

The native soils underlying the subject site are not considered to be susceptible to liquefaction. The site classification for seismic site response per section 4.1.8.4 of the 2006 B.C. Building Code may be taken as Site Class C based on the site being underlain by very dense glacial till and stiff to very stiff clayey silt.

5.3 Site Preparation for Buildings

As discussed above, it is anticipated that the very dense till deposit will generally be encountered at the proposed foundation level based on the test hole results. However, there is possibility that some over-excavation will be required locally to expose suitable subgrade for foundations. Levelton should be contacted to carry out field review of foundation subgrade to assess if additional excavation or re-designing the foundation for a lowered bearing resistance is required.

Any soil that becomes disturbed, softened or frozen should be stripped from the footing areas.

Structural fill may not be placed at footing areas for the bearing resistance provided. Lean concrete may be placed below foundation if desired to restore grade. Lean concrete fill should extend beyond footings by a minimum 0.3 m horizontal distance.

Material excavated from on-site is not expected to be suitable for re-use as under-slab fill or perimeter backfill due to high silt and clay content.

5.4 Slab-On-Grade

A 150 mm thick layer of 19 mm clear crushed gravel is recommended immediately below slab-on-grades to facilitate drainage. The under-slab fill layer should be compacted to 98% Standard Proctor maximum dry density.

5.5 Perimeter Drainage

It is recommended that the proposed buildings be provided with a perimeter drainage system connected to the storm water sewer system. It is recommended that the perimeter drainage system be comprised of a perforated drainpipe with an invert at least 12-inches below the floor slab level. The drainpipe should be surrounded by 6-inches of drain rock. A 6-inch layer of birdseye gravel is recommended directly over the drain rock as a filter separator between the drain rock and the overlying backfill.

Where perimeter drainpipes are located on the inside of the perimeter foundation walls, it is recommended that 75 mm diameter weep-holes be provided at 1.8 m centres through the foundation wall to allow the perimeter backfill to drain to the drainpipes.

It is recommended that elevator pits be water-proofed.

5.6 Horizontal Earth Pressures and Backfill

It is recommended that backfill placed in the narrow slot between the foundation wall and the vertical excavation shoring consist of birdseye gravel. Birdseye gravel backfill should be compacted in 2 ft. lifts by sluicing with a strong jet of water and inserting a concrete vibrator. Drainage for the backfill should be provided by perimeter drainpipes in the case of foundation walls.

Along Johnston Road, it is anticipated that the excavation will extend several feet onto the City of White Rock property. White Rock requires that the backfill consist of compacted pit-run sand and gravel. It is recommended that the sand and gravel backfill be free-draining with less than 3% silt content by weight. The backfill should be compacted in 1 ft. lifts to 95% SPD to within 1.5 m of city grade and 100% SPD for the upper 1.5 m to limit the potential for ground settlements.

Under static conditions, it is recommended that foundation walls restrained against rotating be designed based on an unfactored uniform soil pressure of 19.2 kPa (400psf) from ground surface to 3 m depth. Below 3 m depth, the backfill pressure may be calculated based on an equivalent fluid pressure of 6.4 kN per cubic meter (40 pcf).

For seismic design, the unfactored backfill pressure may be taken as a uniform pressure equivalent to 8.3 kN per cubic meter (52 Pcf) times the wall height.

For calculating the factored sliding resistance for foundations, a factored friction factor of 0.4 may be used.

5.7 Excavation

It is anticipated that vertical excavation shoring will be required on all sides. Levelton has been retained to design and prepare excavation shoring drawings which will be forwarded under a separate cover.

It is likely that the very dense till deposit will contain boulders that may require splitting for removal.

As general guideline, it is recommended that temporary slopes be trimmed at 4 Vertical:3 Horizontal for stability.

It is anticipated that ground water seepage from excavation sides can be drained by pumping from sumps and ditches.

6.0 GEOTECHNICAL REVIEW

It is recommended that structural, mechanical, civil and site grading drawings be provided to Levelton when available so that it can be assessed if the drawings are in general conformance with the intent of this report or if additional geotechnical recommendations are required.

During construction, geotechnical field review will be required in order to confirm that the ground conditions are as expected, and that the work is undertaken in general accordance with the intent of the geotechnical recommendations. The field review will involve the following:

- Field review of excavation and shoring works.
- Field review of foundation subgrade prior to pouring concrete.
- Verify the compaction of engineered fill for the proposed buildings including under-slab fills and perimeter backfill.
- Field Review of excavation shoring decommissioning.

7.0 CLOSURE

The attached Terms of Reference are an integral part of this geotechnical report.

We trust the information presented sufficiently meets your immediate requirements. If you have any questions or require further assistance, please contact the undersigned.

Yours very truly

LEVELTON CONSULTANTS LTD.



Per: Steven J. Case, P.Eng



MARCH 15, 2007

Reviewed by: Chelsea F. Lynn, P.Eng

Attachments: Appendix A – Figures
Appendix B – 2007 Test Hole Logs DH-1 and AH-101 to AH-109
Appendix C – 2001 Test Hole Logs AH-1 to AH-7

cc: ABBARCH Partnership Architects
Attention: Mr. David Svehla

cc: Glotman Simpson Engineers Ltd.
Attention: Mr. Scott Kenyon

cc: Scott Construction Group
Attention: Mr. Jeff Ryan

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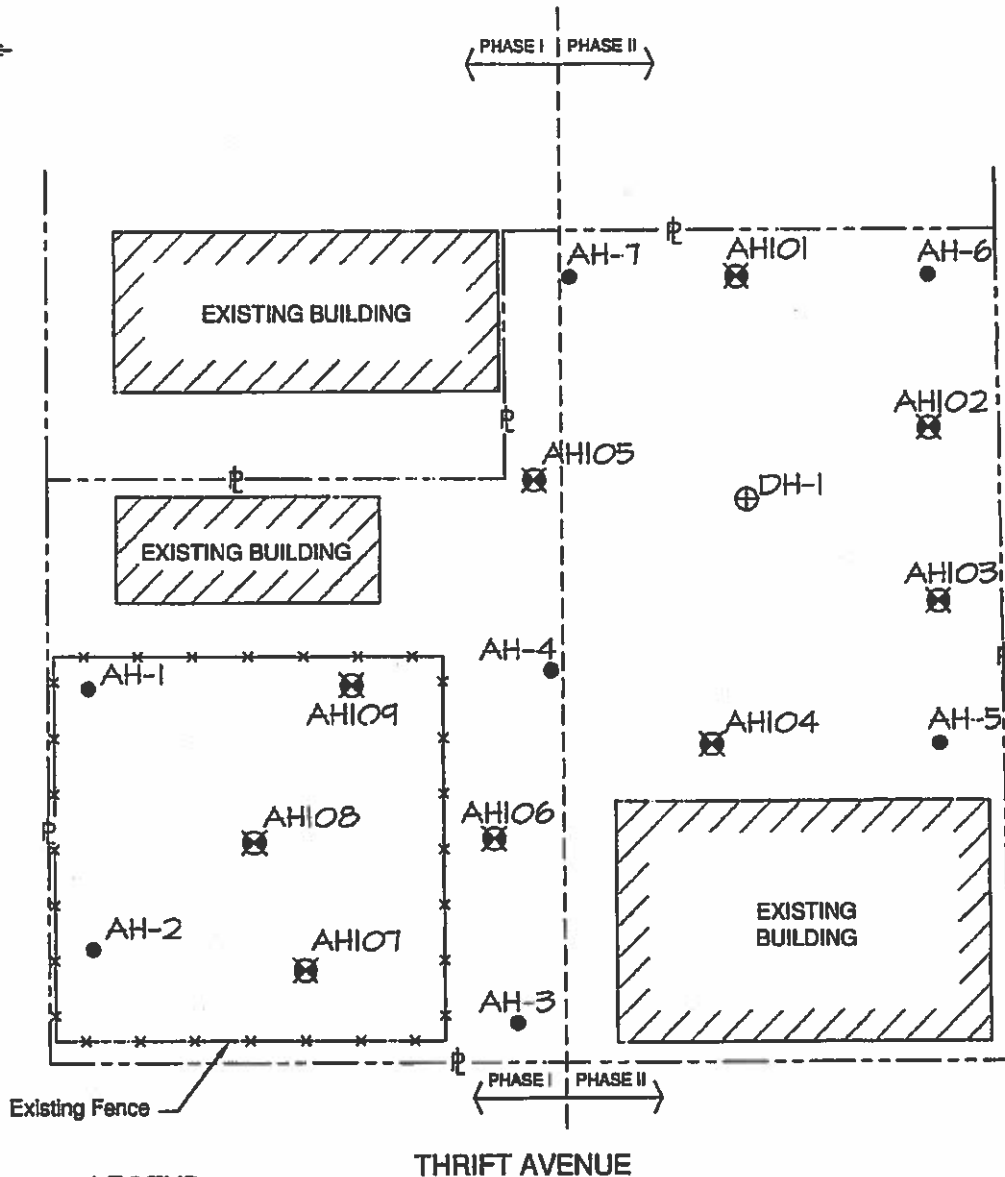
APPENDIX A

FIGURES



152 STREET (JOHNSTON ROAD)

GEORGE STREET



LEGEND

- ⊗ AUGER HOLE
- ⊕ DRILL HOLE
- AUGER HOLE (COMPLETED BY COOK PICKERING & DOYLE LTD. IN 2001)

THRIFT AVENUE

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No.	DRAWN	DATE	REVISIONS/ISSUE



LEVELTON
Engineering Solutions

Levelton Consultants Ltd.
150-12791 Clarke Place
Richmond, B.C. Tel: 604 278-1411
Fax: 604 278-1042

PROJECT:

TEST HOLE LOCATION PLAN

THRIFT AVENUE & 152 STREET
WHITE ROCK, BC

CLIENT:

DRAWN	SCALE
MLM	1"=50'
CHECKED	DATE
	MAR 2007
FILE NUMBER	
1606-0803	
DRAWING NUMBER	REV
1	

APPENDIX B

2007 TEST HOLE LOGS DH-1 AND AH-101 TO AH-109



File: 1606-0803

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
JOHNSTON AT THRIFT AVENUE, WHITE ROCK B, C



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Johnston Road & Thrift Avenue
White Rock, BC
Proposed Mixed-Use Residential Development

DH-1

Pg 2 of 2

Project No: 1606-0803

Depth		Description	Piezo 2	Piezo 1	C	N	Type	Water Level																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
(m)	(ft)								10	20	30	40	50	60	70	80	90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	70	glacial TILL - br.gr. gravelly silty SAND and sandy SILT, some cobbles (continued)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

G: Condition of Sample

Good
Disturbed
No Recovery

T: Type of Sampler

SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows

WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

- Moisture Content %
- Plastic Limit %
- Liquid Limit %
- Ground Water Level
- Shear strength in kPa (Torvane or Penetrometer)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Bentonite/Grout Plug
Solid Pipe
Cuttings
Slotted Pipe
Sand/Pea-Gravel

Drill Method:

Mud Rotary
Date Drilled: 12/14/2006
By: RIG

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Johnston Rd. & Thrift Ave.
WHITE ROCK
Mixed - Use Residential Development

AH - 101

Pg 1 of 1

Project No: 1608-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
0	FILL - 3.5" Asphalt over 7" br. silty Sand & Gravel Base, compact													
5	FILL - br. silty Sand & Gravel, compact (bottom 6" is saturated) mottled br. clayey SILT, trace gravel, hard to very stiff			G										
10				G										
15	gr. br. sandy SILT, some clay, gravel, dense (Till-like)			G										
20	br. gr. sandy SILT, some clay, gravel, some silty sand layers (glacial TILL)			G										
20.0	Bottom of hole at 20.0 feet.													
25														
30														
35														
40														
45														
50														
55														
60														
65														

C: Condition of Sample
Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler
SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows
WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

● Moisture Content %
▲ Plastic Limit %
▲ Liquid Limit %
✕ Ground Water Level
✕ Shear strength in kPa (Torvane or Penetrometer)
✕ Shear strength in kPa (Unconfined)
✕ Shear strength in kPa (field vane)
✕ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method: Solid Stem Auger
Date Drilled: 1/14/2007
By: RG

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Johnston Rd. & Thrift Ave.
WHITE ROCK
Mixed - Use Residential Development

AH - 102

Pg 1 of 1

Project No: 1806-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
	FILL - 3.5" Asphalt over 6.5" br silty Sand & Gravel Base, compact													
	FILL - br. silty Sand & Gravel, compact mottled br. clayey SILT, some gravel, hard			G										
5	br. sandy SILT, dense			G										
2	br. SILT, some clay, sand, stiff			G										
10	gr. br. clayey SILT, trace gravel, stiff to firm			G										
4				G										
15				G										
6	gr. br. sandy SILT, some clay, gravel, dense (Till-like)			G										
20				G										
25	br. gr. clayey SILT, some sand, gravel, hard			G										
8	br. gr. sandy SILT, some gravel (glacial TILL), auger refusal at 27.5 ft.			G										
	Bottom of hole at 27.5 feet.													
30														
10														
35														
12														
40														
14														
45														
50														
18														
55														
19														
60														
65														

G: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows
WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

● Moisture Content %
▲ Plastic Limit %
▲ Liquid Limit %
▼ Ground Water Level
∞ Shear strength in kPa (Torvane or Penetrometer)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (field vane)
⊠ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger
Date Drilled: 1/14/2007
By: RG

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Johnston Rd. & Thrift Ave.
WHITE ROCK
Mixed - Use Residential Development

AH - 103

Pg 1 of 1

Project No: 1606-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
5	FILL - 3.5" Asphalt over 8.5" br. silty Sand & Gravel Base, compact			G										
5	FILL - br. silty Sand & Gravel, compact (bottom 1 ft. is saturated)													
2	mottled br. SILT, some clay, sand, trace gravel, hard to very stiff			G										
10	gr br clayey SILT, stiff to firm			G										
4				G										
15				G										
6	br.gr. sandy clayey SILT, some gravel, firm			G										
20	br.gr. SILT, some clay, trace gravel, very stiff to hard			G										
25	br.gr. sandy SILT, some gravel (glacial TILL)			G										
25	Bottom of hole at 25.0 feet.													
30														
10														
35														
12														
40														
45														
14														
50														
16														
55														
18														
60														
65														

C: Condition of Sample
Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

Moisture Content %
Plastic Limit %
Liquid Limit %
Ground Water Level
Shear strength in kPa (Torsion or Penetrometer)
X Shear strength in kPa (Unconfined)
Shear strength in kPa (field vane)
Rammed strength in kPa
Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger
Date Drilled: 1/14/2007
By: RG

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Johnston Rd. & Thrift Ave
WHITE ROCK
 Mixed - Use Residential Development

AH - 104

Pg 1 of 1

Project No: 1606-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
0	FILL - 4.5" Asphalt over 9.5" br silty Sand & Gravel Base, compact			G										
5	reddish br. silty SAND & GRAVEL, med dense (bottom 6" is saturated)			G										
2	gr br. clayey SILT, trace gravel, hard to very stiff			G										
10				G										
4	br. SILT, some clay, sand, trace gravel, very stiff			G										
15	br gr. silty SAND, some gravel, trace gravel, dense			G										
6	gr br. clayey SILT, some sand, gravel, very stiff to hard			G										
20	gr br. sandy SILT, some gravel (glacial TILL), auger refusal at 24 ft.			G										
25	Bottom of hole at 24.0 feet													
30														
35														
40														
45														
50														
55														
60														
65														

1 LOG PER PAGE 1606-0803 - AUGER HOLES - JAN-17-2007.GPJ LEVELTON.GDT 27/07

Condition of Sample

Good ☒
 Disturbed ☐
 No Recovery ☐

Type of Sampler

SPT: 2 in. standard
 ST: Shelby
 FP: Fixed Piston
 G: Grab
 CORE

N: Number of Blows

WH: Weight of Hammer
 WR: Weight of Rod
 Standard Penetration Test: ASTM D1586
 Hammer Type:

- Moisture Content %
- ▲ Plastic Limit %
- ▲ Liquid Limit %
- ▼ Ground Water Level
- Shear strength in kPa (Torvane or Penetrometer)
- ✕ Shear strength in kPa (Unconfined)
- ⊗ Shear strength in kPa (field vane)
- ⊠ Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

Date Drilled: 1/14/2007

By: RG

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Depth (m) (ft)	Description	C	N	Type	Water Level
0	FILL - 4.5" Asphalt over 10.5" br silty Sand & Gravel Base, compact				
5	reddish br. silty SAND & GRAVEL, med. dense			G	
10	mottled gr.br. clayey SILT, trace gravel, hard to very stiff			G	
15	gr.br. SILT, some sand, clay, trace gravel, very stiff			G	
20	gr.br. clayey SILT, trace gravel, stiff			G	
25	gr.br. sandy SILT, some gravel (glacial TILL), auger refusal at 17.5 ft.			G	
30	Bottom of hole at 17.5 feet.				

C: Condition of Sample

Good ☐
Disturbed ☒
No Recovery ☐

Type: Type of Sampler

SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

No. Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1688
Hammer Type:

- Moisture Content %
- Plastic Limit %
- ◄ Liquid Limit %
- ⌵ Ground Water Level
- ⊗ Shear strength in kPa (Torrans or Penetrometer)
- ✕ Shear strength in kPa (Unconfined)
- ⊕ Shear strength in kPa (field vane)
- ⊗ Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

Date Drilled: 1/14/2007

By: RG

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Johnston Rd. & Thrift Ave
WHITE ROCK
Mixed - Use Residential Development

AH - 106

Pg 1 of 1

Project No: 1606-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
0	FILL - 3.5" Asphalt over 8.5" br.gr. Sand & Gravel Base, compact			G										
5	FILL - br. silty Sand & Gravel, with cobbles reddish br. silty SAND & GRAVEL, med. dense (saturated)			G										
2	mottled br. clayey SILT, trace gravel, hard to very stiff			G										
10				G										
4	gr.br. sandy SILT, some gravel (glacial TILL), auger refusal at 13 ft.			G										
15	Bottom of hole at 13.0 feet													
20														
25														
30														
35														
40														
45														
50														
55														
60														
65														
70														
75														
80														
85														
90														

Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows

WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

- Moisture Content %
- Plastic Limit %
- Liquid Limit %
- Ground Water Level
- Shear strength in kPa (Torsion or Penetrometer)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

Date Drilled: 1/14/2007

By: RG

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WHITE ROCK
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AH - 107

Pg 1 of 1

Project No: 1608-0803

Depth	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
(m) (ft)														
5	FILL - gr.br. silty Sand & Gravel, compact													
	FILL - dk.br. sandy Silt & Gravel													
	reddish br. silty SAND & GRAVEL, med. dense (gr.br. below 4 ft.)			G										
2	gr.br. clayey SILT, some gravel, very stiff			G										
10	br. clayey SILT, some sand, gravel, stiff			G										
4	gr. sandy clayey SILT, some gravel, firm			G										
15	gr.br. clayey SILT, some sand, gravel, very stiff			G										
20	br. SILT, some sand, gravel, clay, very stiff			G										
25	gr.br. sandy SILT, some gravel (glacial TILL), auger refusal at 26 ft.			G										
26	Bottom of hole at 26.0 feet.													
30														
10														
35														
12														
40														
14														
45														
16														
50														
18														
55														
60														
65														

Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows

WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

- Moisture Content %
- Plastic Limit %
- Liquid Limit %
- Ground Water Level
- Shear strength in kPa (Torsion or Penetrometer)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

Date Drilled: 1/15/2007

By: RG

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WHITE ROCK
Mixed - Use Residential Development

AH - 108

Pg 1 of 1

Project No: 1606-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
0	FILL - br silty Sand & Gravel, compact			G										
1	reddish br silty SAND & GRAVEL, med dense			G										
2	mottled br clayey SILT, trace gravel, hard to very stiff			G										
3														
4	br.gr. sandy SILT, some clay, gravel, dense (Till-like)			G										
5														
6				G										
7														
8	br.gr. sandy SILT, some gravel (glacial TILL)			G										
9														
10	Bottom of hole at 30.0 feet													
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
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60														
61														
62														
63														

C: Condition of Sample
Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1585
Hammer Type:

● Moisture Content %
▼ Plastic Limit %
▲ Liquid Limit %
x Ground Water Level
OO Shear strength in kPa (Torvane or Penetrometer)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (field vane)
⊠ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger
Date Drilled: 1/15/2007
By: RG

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Johnston Rd. & Thrift Ave.
WHITE ROCK
Mixed - Use Residential Development

AH - 109

Pg 1 of 1

Project No: 1608-0803

Depth (m) (ft)	Description	C	N	Type	Water Level	10	20	30	40	50	60	70	80	90
0	FILL - 2" Asphalt over 4" gr. Sand & Gravel Base, compact			G										
2	reddish br. silty SAND & GRAVEL, med. dense			G										
5	gr. br. sandy SILT, some clay, gravel (saturated)			G										
10	gr. br. clayey SILT, trace gravel, hard			G										
15	gr. br. clayey SILT, some sand, gravel, hard (Till-like)			G										
20	br. gr. clayey SILT, some sand, gravel, hard			G										
25	br. gr. sandy SILT, some gravel (glacial TILL), auger refusal at 27 ft.			G										
30	Bottom of hole at 27.0 feet													
35														
40														
45														
50														
55														
60														
65														

G: Condition of Sample
Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler
SPT: 2 in. standard
ST: Shelby
FP: Fixed Piston
G: Grab
CORE

N: Number of Blows
WH: Weight of Hammer
WR: Weight of Rod
Standard Penetration Test: ASTM D1586
Hammer Type:

● Moisture Content %
▲ Plastic Limit %
▲ Liquid Limit %
x Ground Water Level
⊗ Shear strength in kPa (Torsion or Penetrometer)
x Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (field vane)
⊗ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger
Date Drilled: 1/15/2007
By: RG

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APPENDIX C

2001 TEST HOLE LOGS AH-1 TO AH-7

141 East 7th Avenue, Vancouver, British Columbia V5T 1M5

Depth (ft)	C	N	Type																	Depth (m)	Description	
				10	20	30	40	50	60	70	80	90										
	<div><div></div><div></div><div></div><div></div><div></div></div>		Grab																		<div><div></div><div></div><div></div><div></div><div></div></div>	FILL - 3 in. Asphalt over brown Sand, some gravel & silt, med. dense (some clayey silt from 1.5' to 2.5')
	<div><div></div><div></div><div></div><div></div><div></div></div>		Grab																		<div><div></div><div></div><div></div><div></div><div></div></div>	
	<div><div></div><div></div><div></div><div></div><div></div></div>		Grab																		<div><div></div><div></div><div></div><div></div><div></div></div>	brown/gray clayey SILT, very stiff
10	<div><div></div><div></div><div></div><div></div><div></div></div>		Grab																		<div><div></div><div></div><div></div><div></div><div></div></div>	
	<div><div></div><div></div><div></div><div></div><div></div></div>		Grab																		<div><div></div><div></div><div></div><div></div><div></div></div>	glacial TILL (brown/gray sandy Silt, some clay & gravel)
																					<div><div></div><div></div><div></div><div></div><div></div></div>	
																						5
20																						
30																						
																						10
40																						
50																						15
60																						
																						20

C : Condition of Sample

N : Standard Penetration Test

Type : Type of sampler -

● : Moisture Content as a percentage of dry soil weight

▼ : Ground Water Level

■ : Good

ASTM D1588

SPT : 2 in standard

percentage of dry soil weight

Shear strength in kPa -

 : Disturbed

S : Shelby FP

weight

Pa - X : Unconfine

 : No recovery

W/H : Weight of hammer

Fixed Piston HFP : 1

: Plastic Limit —

(X) : Torvane or Pen

WR : Weight of rod

Hydraulic Fixed Piston

: Liquid Limit

rometer

By: HRI

Date: OCT/01

Checked: RG

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141 East 7th Avenue, Vancouver, British Columbia V5T 1M5

THRIFT AVENUE & 152nd STREET
WHITE ROCK, B.C.

Project 10107
AH-2

Depth (ft)	C	N	Type	10	20	30	40	50	60	70	80	90	Depth (m)	Description
			Grab											FILL - 2 in. Asphalt over 3/4 in minus Sand & Gravel, medium dense
			Grab											FILL - dark brown silty Sand & Gravel, med. dense
			Grab											reddish brown Sand & Gravel, some silt, medium dense
10			Grab											brown/gray clayey SILT, very stiff
			Grab											
			Grab											
20			Grab											glacial TILL (brown/gray clayey sandy Silt, some gravel)
													5	
30													10	
40														
50													15	
60													20	

C : Condition of Sample - : Good : Disturbed : No recovery
N : Standard Penetration Test ASTM D1586 WH : Weight of hammer WR : Weight of rod
Type : Type of sampler - SPT : 2 in. standard S : Shelby FP : Fixed Piston HFP : Hydraulic Fixed Piston
● : Moisture Content as a percentage of dry soil weight ➤ : Plastic Limit ➤ : Liquid Limit
X : Ground Water Level Shear strength in kPa - X : Unconfined (X) : Torvane or Penetrometer

By: HRI
Date: OCT/01
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141 East 7th Avenue, Vancouver, British Columbia V5T 1M5

[illegible]

C : Condition of Sample -

ASTM D1585

||||| : Disturbed

 : No recovery

N : Standard Penetration Test

ASTM D1586

WH : Weight of hammer

WR : Weight of rod

Type : Type of sampler -

SPT : 2 in standard

S : Shelby

FP : Fixed Piston

HFP : Hydraulic Fixed Piston

● : Moisture Content as a percentage of dry soil weight

— : Plastic Limit

→ : Liquid Limit

 : Ground Water Level

Shear strength in kPa - X : Unconfined (X) : Torvane or Penetrometer

By: HAI

Date: OCT/01

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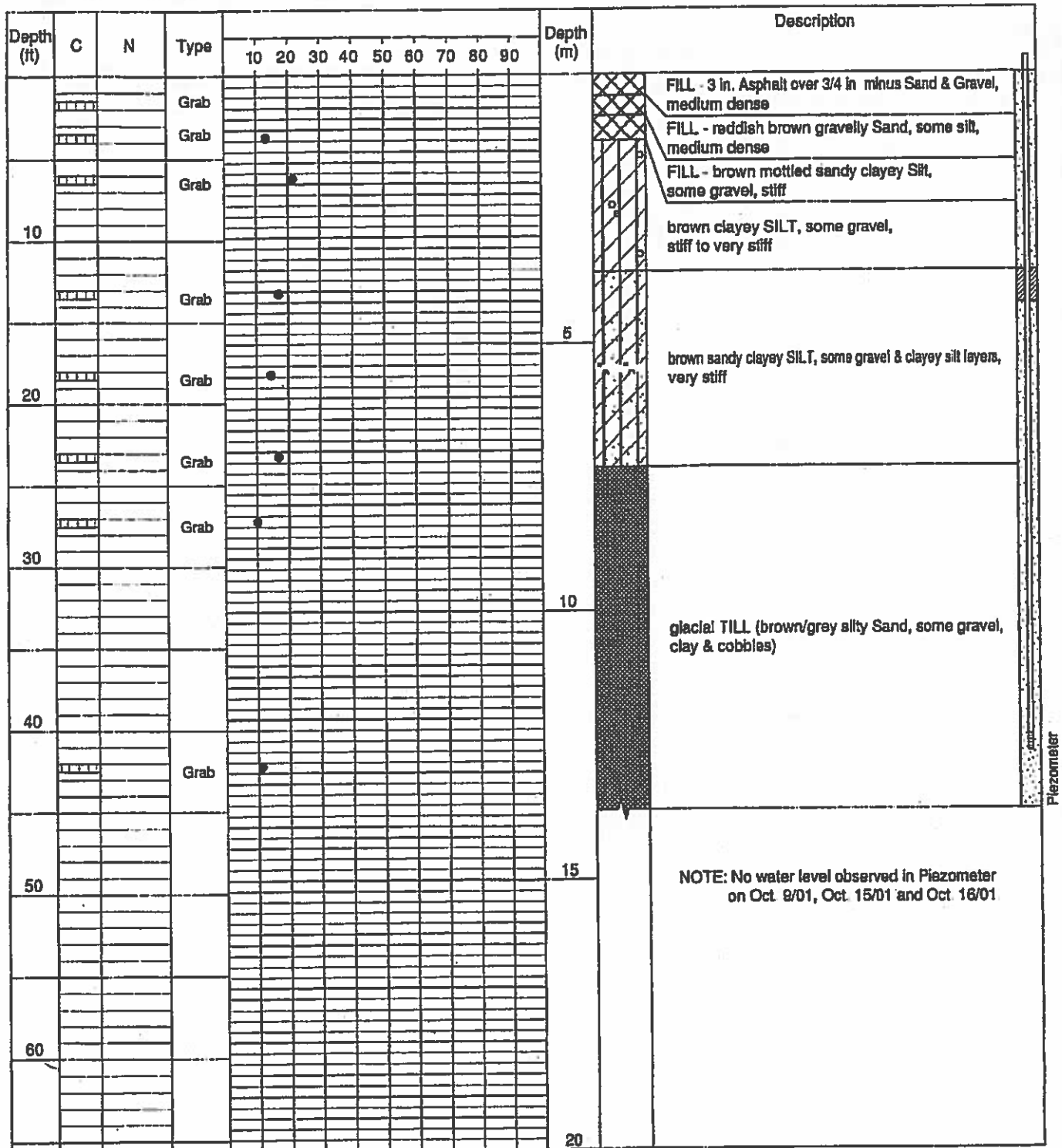


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THRIFT AVENUE & 152nd STREET
WHITE ROCK, B.C.

Project 10107
AH-4



C : Condition of Sample -
N : Standard Penetration Test

■ : Good
ASTM D1586

▤ : Disturbed

▨ : No recovery

Type : Type of sampler -

SPT : 2 in standard

S : Shelby

FP : Fixed Piston

HFP : Hydraulic Fixed Piston

● : Moisture Content as a percentage of dry soil weight

→ : Plastic Limit

← : Liquid Limit

∇ : Ground Water Level

Shear strength in kPa -

X : Unconfined

(X) : Torvane or Penetrometer

By: HRI

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THRIFT AVENUE & 152nd STREET
WHITE ROCK, B.C.

Project 10107
AH-5

141 East 7th Avenue, Vancouver, British Columbia V5T 1M5

Depth (ft)	C	N	Type	10	20	30	40	50	60	70	80	90	Depth (m)	Description
			Grab											FILL - 5 in. Asphalt over 3/4 in. minus Sand & Gravel, medium dense
			Grab											FILL - brown silty Sand & Gravel, medium dense
10			Grab											brown/grey clayey SILT, some sand & gravel, very stiff
20			Grab										5	glacial TILL (brown/grey silty Sand, some clay & gravel)
30														
													10	
40														
50													15	
80														
													20	

C : Condition of Sample -

■ : Good

□ : Disturbed

▨ : No recovery

N : Standard Penetration Test

ASTM D1586

WH : Weight of hammer

WR : Weight of rod

Type : Type of sampler -

SPT : 2 in. standard

S : Shelby

FP : Fixed Piston

HFP : Hydraulic Fixed Piston

● : Moisture Content as a percentage of dry soil weight

— : Plastic Limit

— : Liquid Limit

∇ : Ground Water Level

Shear strength in kPa - X : Unconfined

(X) : Torvane or Penetrometer

By: HRI

Date: OCT/01

Checked: RG

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Depth (ft)	C	N	Type		Depth (m)	Description
				10 20 30 40 50 60 70 80 90		
			Grab			FILL - 3 in. Asphalt over 3/4 in. minus Sand & Gravel, medium dense
			Grab			FILL - yellow/brown gravelly Sand, med. dense
10			Grab			
			Grab			brown/grey clayey SILT, some gravel, stiff to very stiff to 15' & soft to firm below 15'
20			Grab		5	
			Grab			grey sandy clayey SILT, some gravel, stiff
30			Grab			glacial TILL (brown/grey silty Sand,some gravel)
					10	
40						
					15	
50						
60						
					20	

C : Condition of Sample -

N : Standard Penetration Test

Type : Type of sampler -

● : Moisture Content as a percentage of dry soil weight

 : Ground Water Level

■ : Good

ASTM D1586

SPT : 2 in standard

percentage of dry soil weight

Shear strength in kPa · X : Unconfined (X) : Torvane or Penetrometer

 : Disturbed

WH : Weight of hammer

Fixed Piston HFP :

— : Plastic Limit —▲ : Liquid Limit

d (X) : Torvane or Penetrometer

WH : Weight of hammer WR : Weight of rod

Fixed Piston HFP : Hydraulic Fixed Piston

: Plastic Limit : Liquid Limit

By: HRI

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141 East 7th Avenue, Vancouver, British Columbia V5T 1M5

Depth (ft)	C	N	Type		Depth (m)	Description
				10 20 30 40 50 60 70 80 90		
			Grab			FILL - 3.5 Asphalt over 3/4 in. minus Sand & Gravel, medium dense
			Grab			FILL - brown/grey Sand & Gravel, some silt, med. dense
10			Grab			brown/grey clayey SILT, some gravel, stiff to very stiff to 10' & soft to firm below 10'
			Grab			brown sandy clayey SILT, some gravel, stiff
			Grab			brown SAND, some silt & gravel, dense
20			Grab			glacial TILL (brown/grey sandy Silt, some gravel & clay)
30					10	
40					15	
50					20	
60						

C : Condition of Sample -

N : Standard Penetration Test

Type : Type of sampler -

● : Moisture Content as a percentage of dry soil weight

 : Ground Water Level

Good

ASTM D1586

SPT : 2 in standard

Shear strength in kPa -

Disturbed

S : Shelby

FP : Fixed Piston

ned (X) : Torvane or Penetrometer

 : No recovery

WH : Weight of hammer WR : Weight of rod

Fixed Piston **HFP : Hydraulic Fixed Piston**

► : Plastic Limit ◄ : Liquid Limit

(X) : Torvane or Penetrometer

By: HRI

Date: OCT/01

Checked: RG

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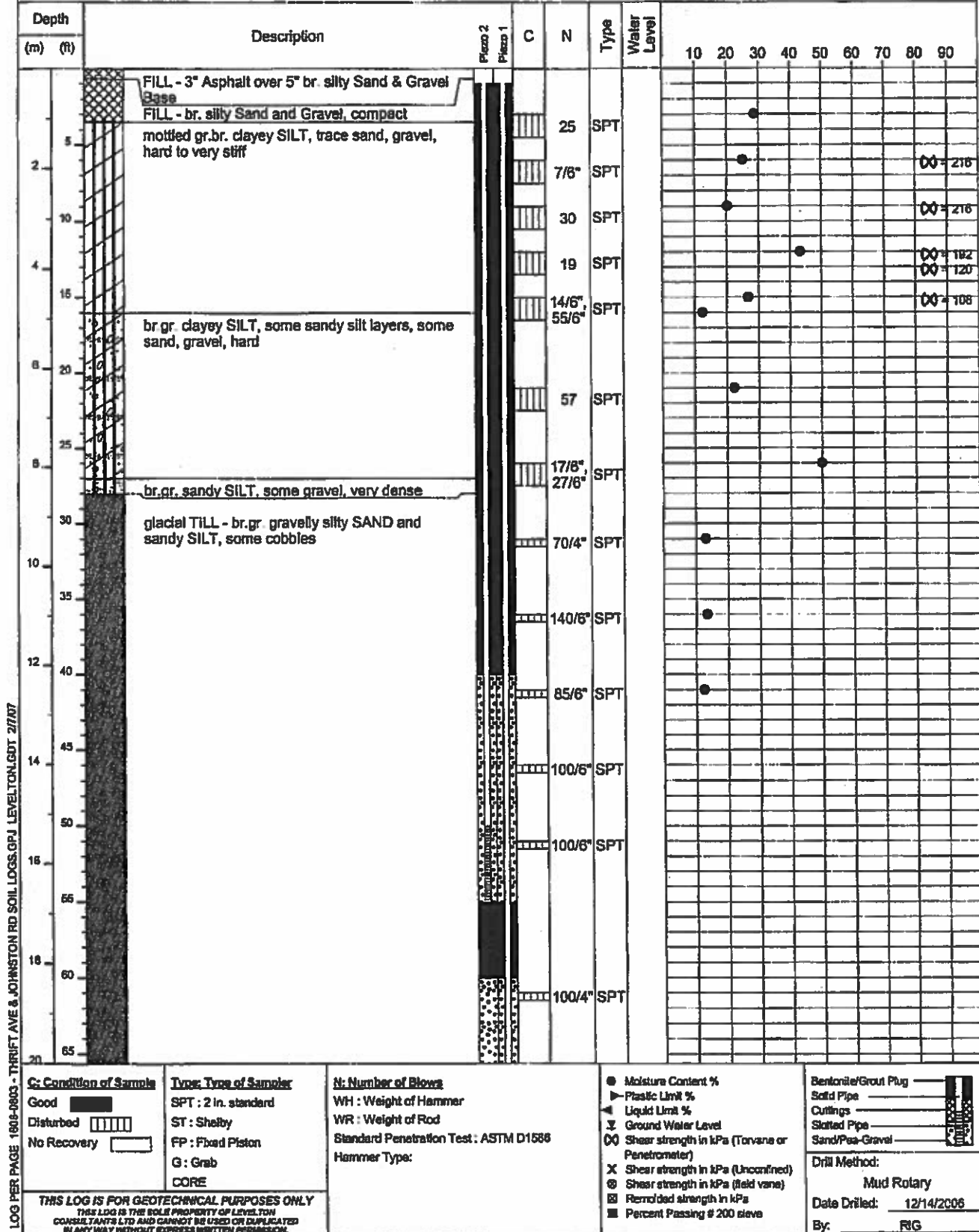
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Johnston Road & Thrift Avenue
White Rock, BC
Proposed Mixed-Use Residential Development

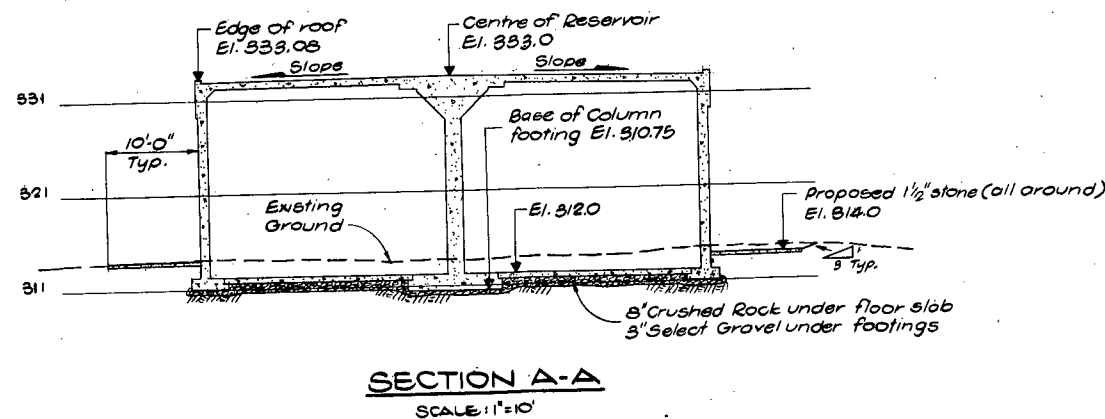
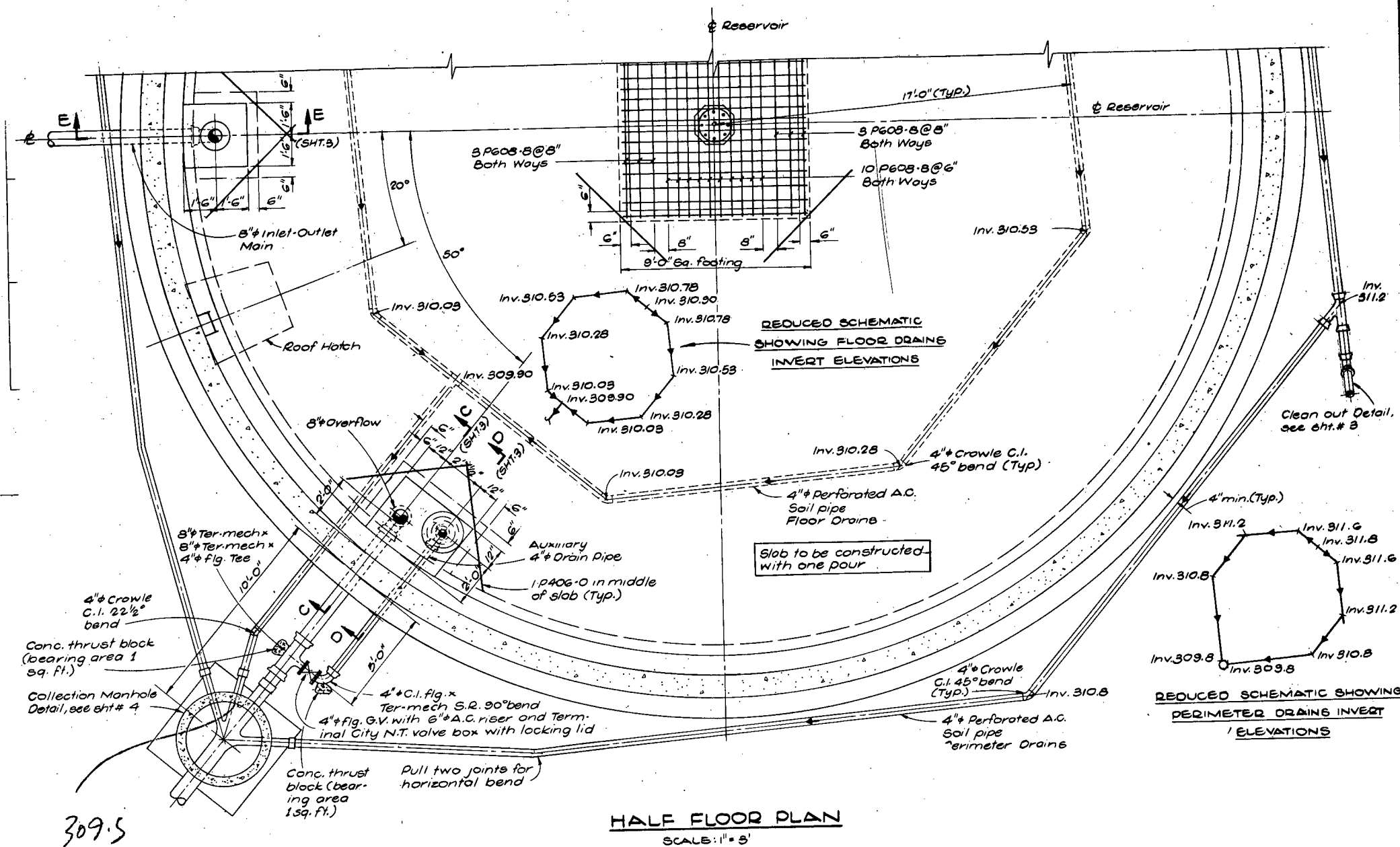
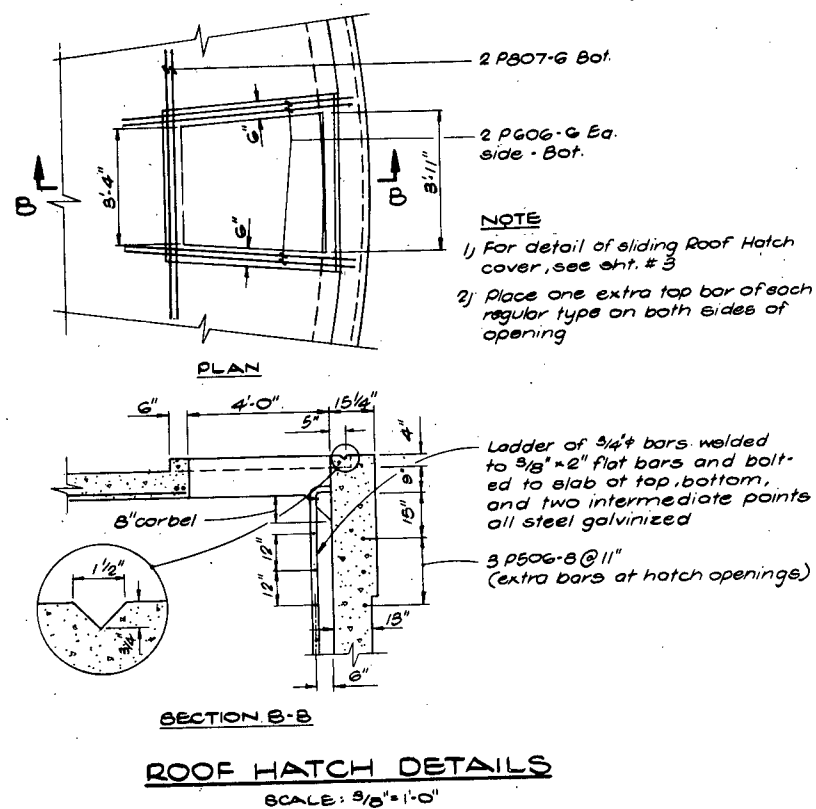
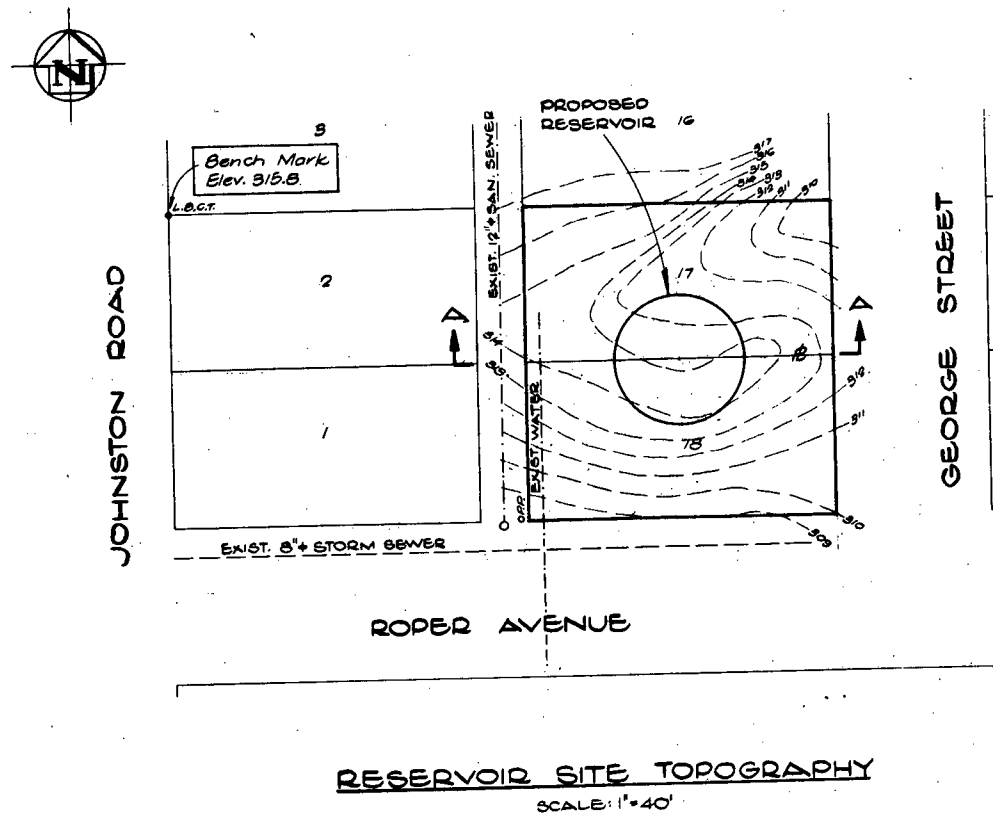
DH-1

Pg 1 of 2

Project No: 1606-0803



APPENDIX E – HISTORICAL ROPER RESERVOIR DRAWINGS



THIS DRAWING REDUCED TO HALF SCALE

[illegible]

DESIGNED D. HARRINGTON
DRAWN D. WALLS
CHECKED DH KPK

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS

K R Kern Nov 1, 1971

WHITE ROCK UTILITIES LIMITED
ROPER AVENUE RESERVOIR
SITE TOPOGRAPHY, SLAB REINF., & PIPING DET'LS

SITE TOPOGRAPHY, SLAB REINF., & PIPING DET'LS

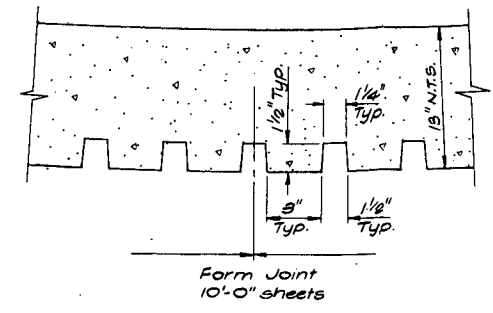
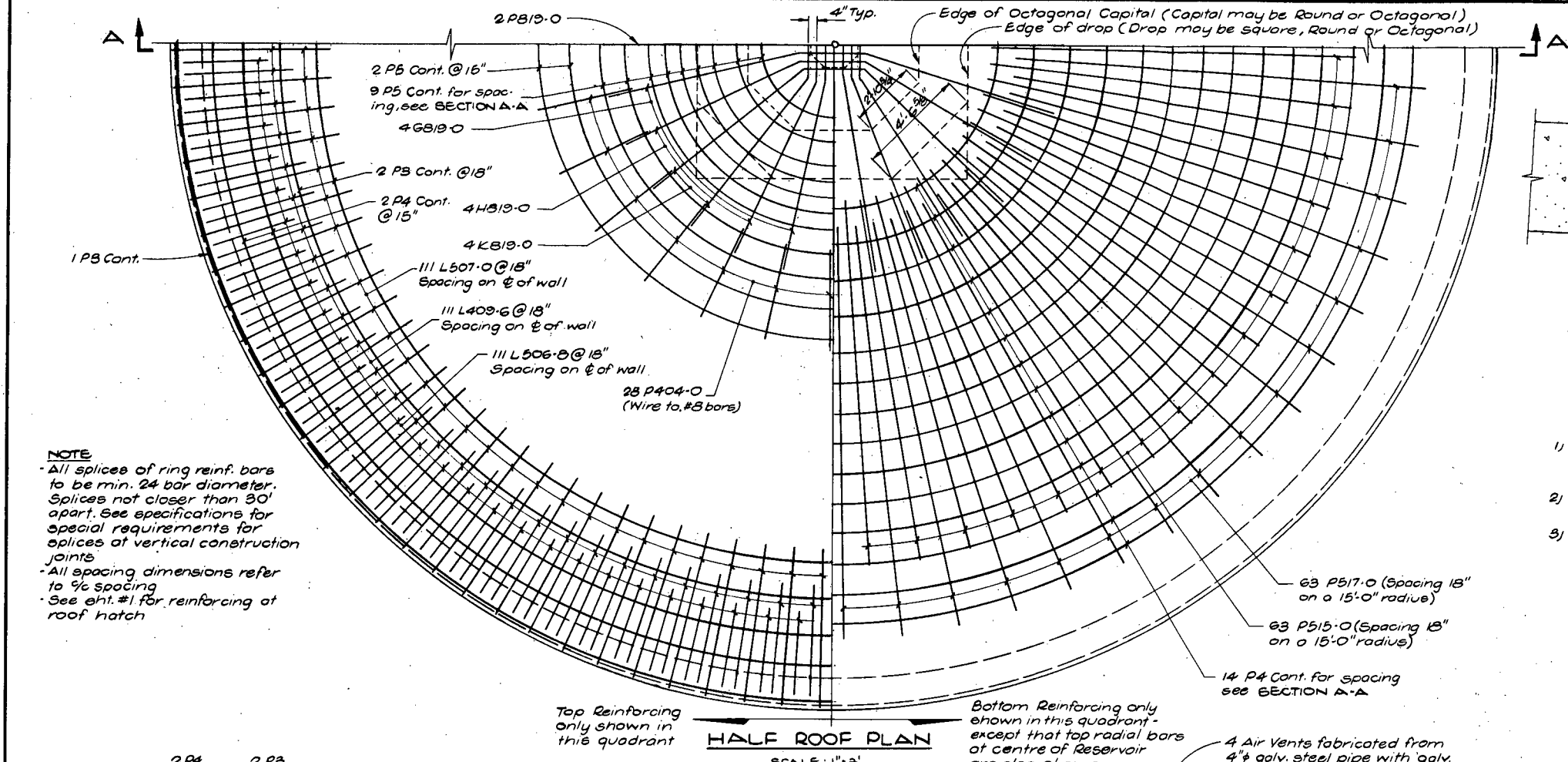
SITE TOPOGRAPHY, SLAB REINF., & PIPING DET'LS

SCALE: AS SHOWN
DRAWING No. 91.2.1
SHEET 1 OF 4

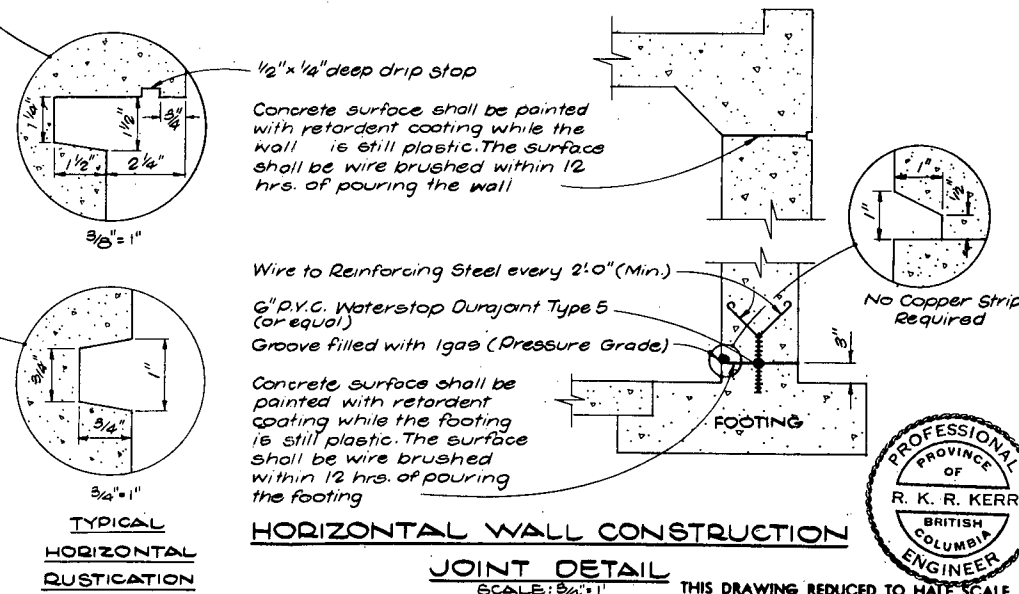
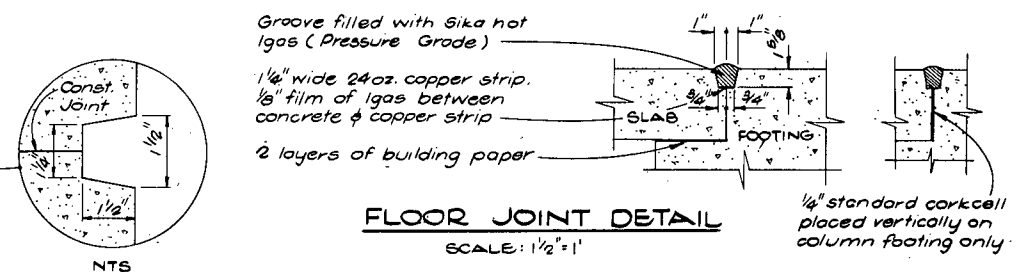
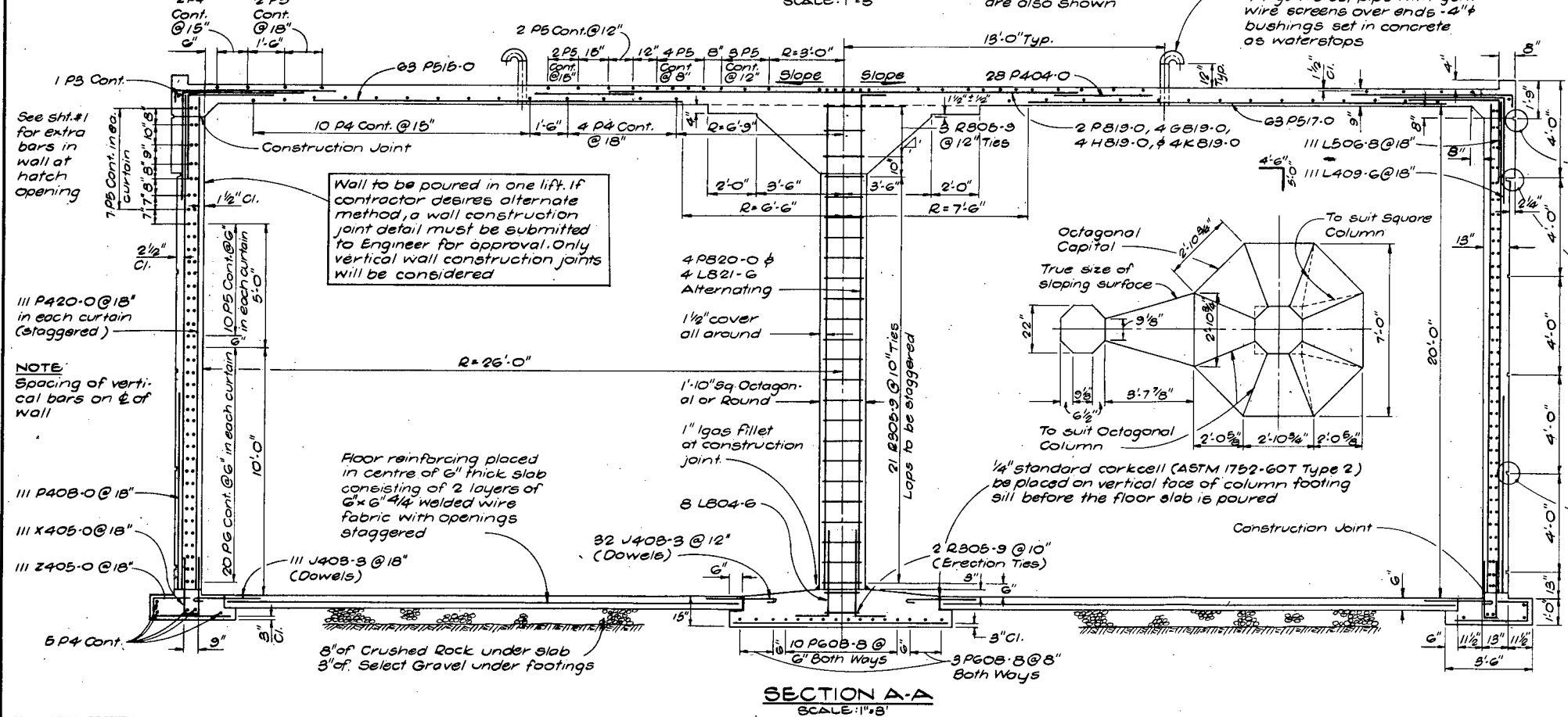
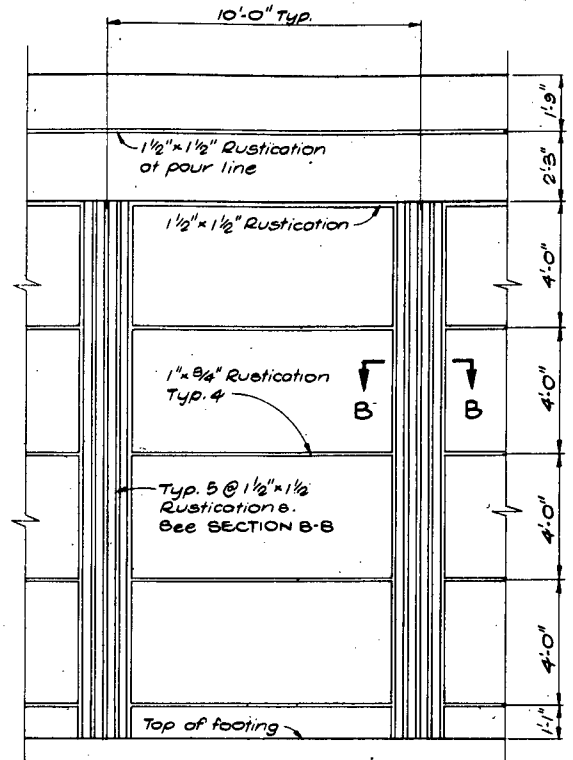
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4 ISSUE A

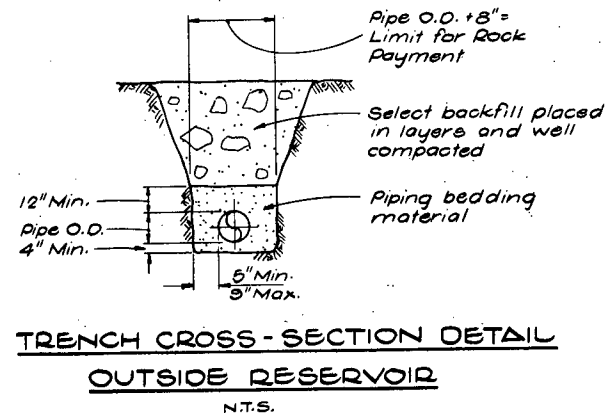
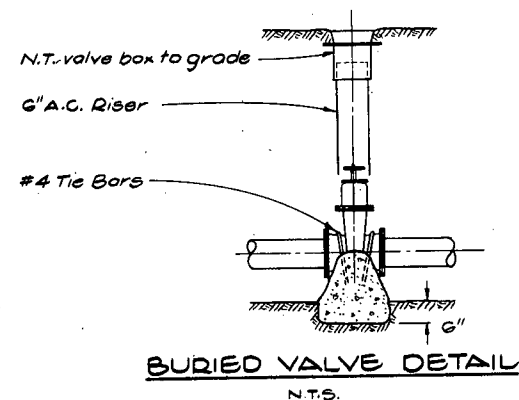
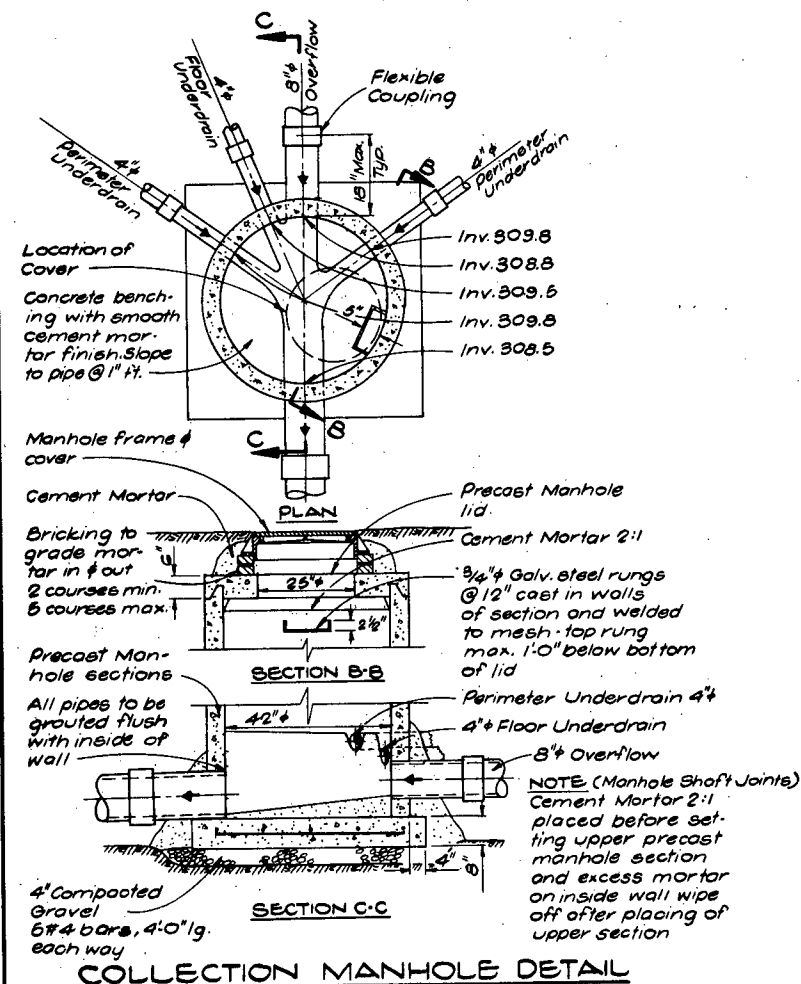
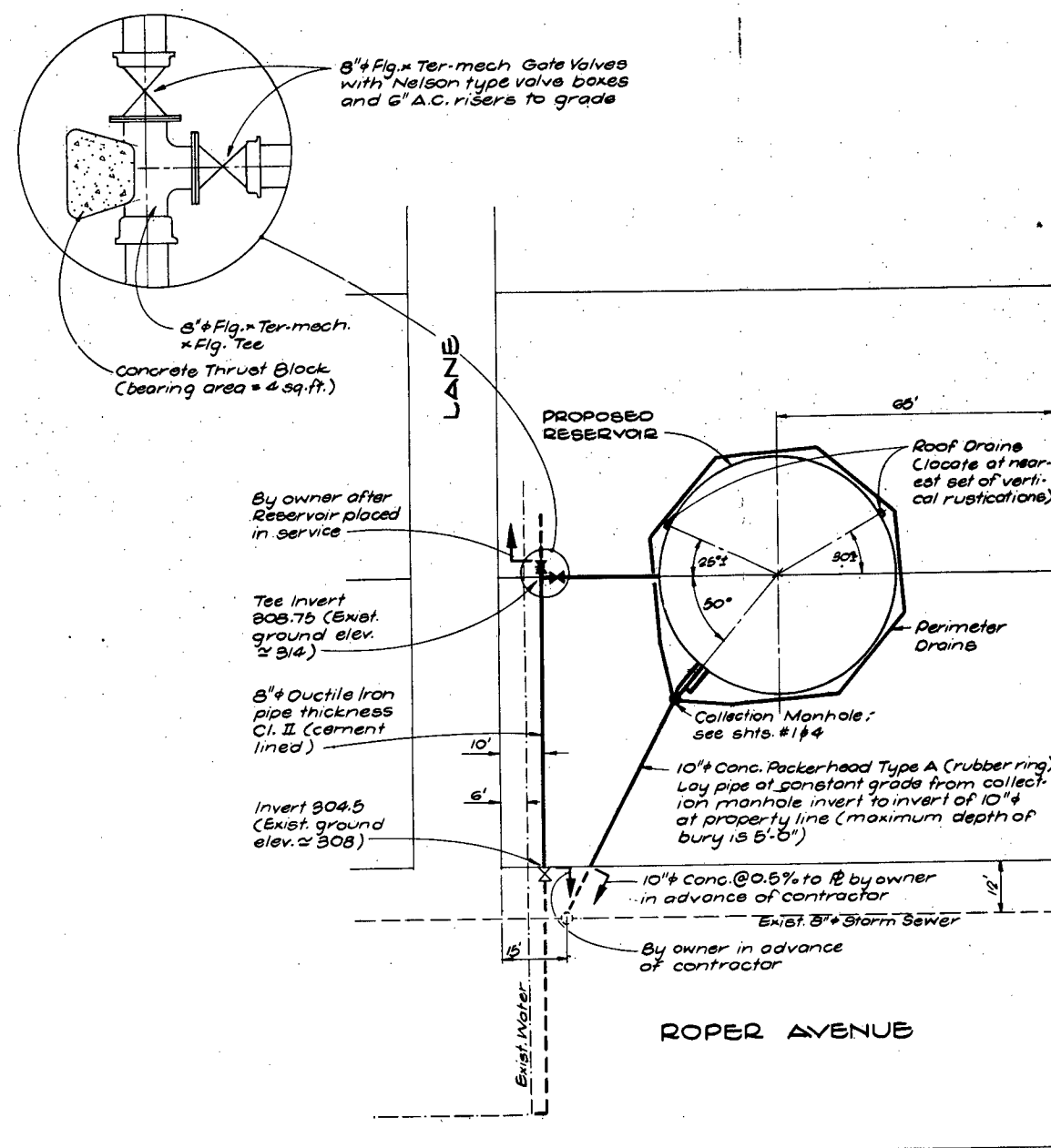
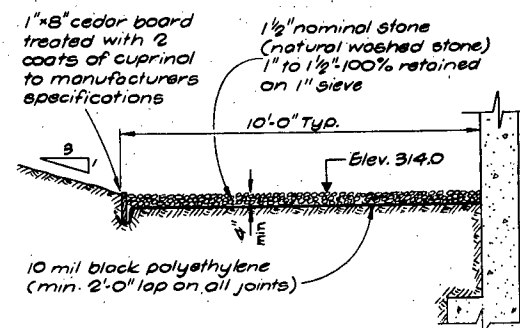
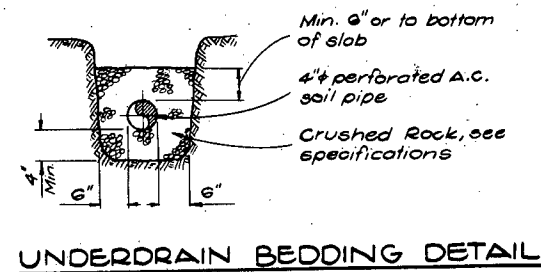
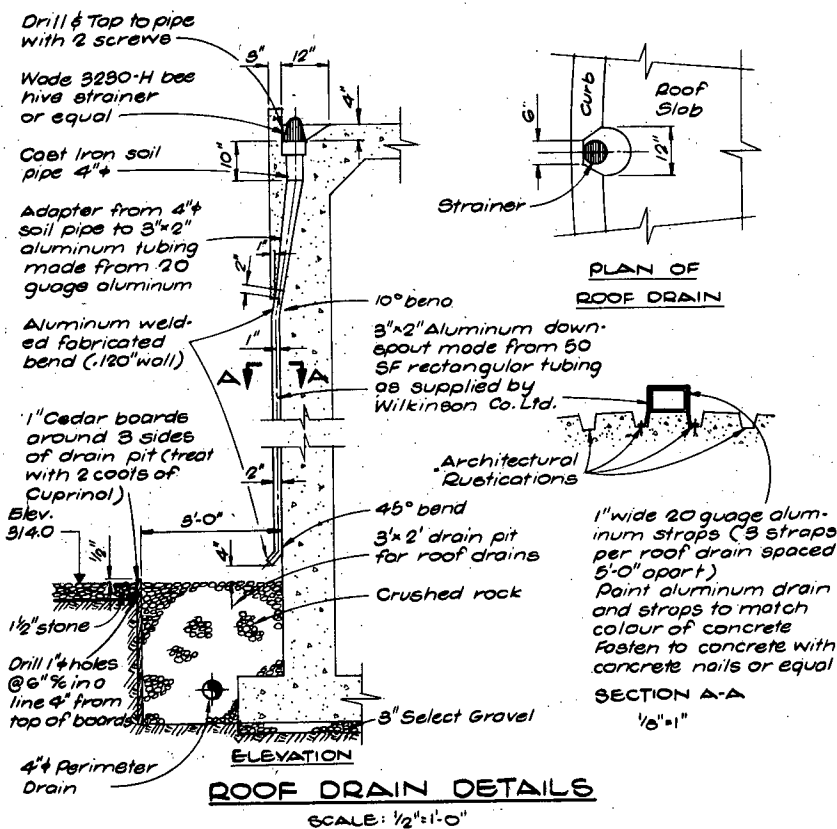


- NOTE:**
- 1) All horizontal & vertical form joints shall line up with rustications (requires 4'x10' plywood forms)
 - 2) All form ties to line up same pattern in each form panel
 - 3) Use double threaded plastic cone ties (1" dia.)



REVISIONS	ISSUE	DATE	DRN	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DRN	CH'D	APP'D	DESCRIPTION	DESIGNED	DRAWN	CHECKED	DAYTON & KNIGHT LTD.	WHITE ROCK UTILITIES LIMITED	SCALE: AS SHOWN
													D. HARRINGTON	D. WALLS	K. K. KERR	DAYTON & KNIGHT LTD.	WHITE ROCK UTILITIES LIMITED	DRAWING No. 21-2-1
																CONSULTING ENGINEERS	ROPER AVENUE RESERVOIR	SHEET 2 OF 4
																	REINFORCING & ARCHITECTURAL TREATMENT	ISSUE A

SCALE: AS SHOWN
DRAWING No. 91.2.1
SHEET 3 OF 4 ISSUE A

[illegible]

DESIGNED: D. HARRINGTON
DRAWN: D. WALLS
CHECKED: *W.H.* *KPK*

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS

WHITE ROCK UTILITIES LIMITED
ROPER AVENUE RESERVOIR
PIPING LAYOUT AND DETAILS

THIS DRAWING REDUCED TO HALF SCALE

SCALE: AS SHOWN
DRAWING No. 91.2.1
SHEET 4 OF 4



APPENDIX F – EXAMPLE CONTRACT

CCDC 4**Unit Price Contract****2 0 1 1**

[Name of Project]

Apply a CCDC 4 copyright seal here. The application of the seal demonstrates the intention of the party proposing the use of this document that it be an accurate and unamended form of CCDC 4 – 2011 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE
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CCDC 4 is the product of a consensus-building process aimed at balancing the interests of all parties on the construction project. It reflects recommended industry practices. CCDC 4 can have important consequences. The CCDC and its constituent member organizations do not accept any responsibility or liability for loss or damage which may be suffered as a result of the use or interpretation of CCDC 4.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

For use when unit prices are the primary basis of payment.

This Agreement made on the _____ day of _____ in the year _____.

by and between the parties

hereinafter called the *Owner*

and

hereinafter called the *Contractor*

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

ARTICLE A-1 THE WORK

The *Contractor* shall:

1.1 perform the *Work* required by the *Contract Documents* for

insert above the name of the Work

located at

insert above the Place of the Work

for which the Agreement has been signed by the parties, and for which

insert above the name of the Consultant

is acting as and is hereinafter called the "*Consultant*" and

1.2 do and fulfill everything indicated by the *Contract Documents*, and

1.3 commence the *Work* by the _____ day of _____ in the year _____ and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Substantial Performance of the Work*, by the _____ day of _____ in the year _____.

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

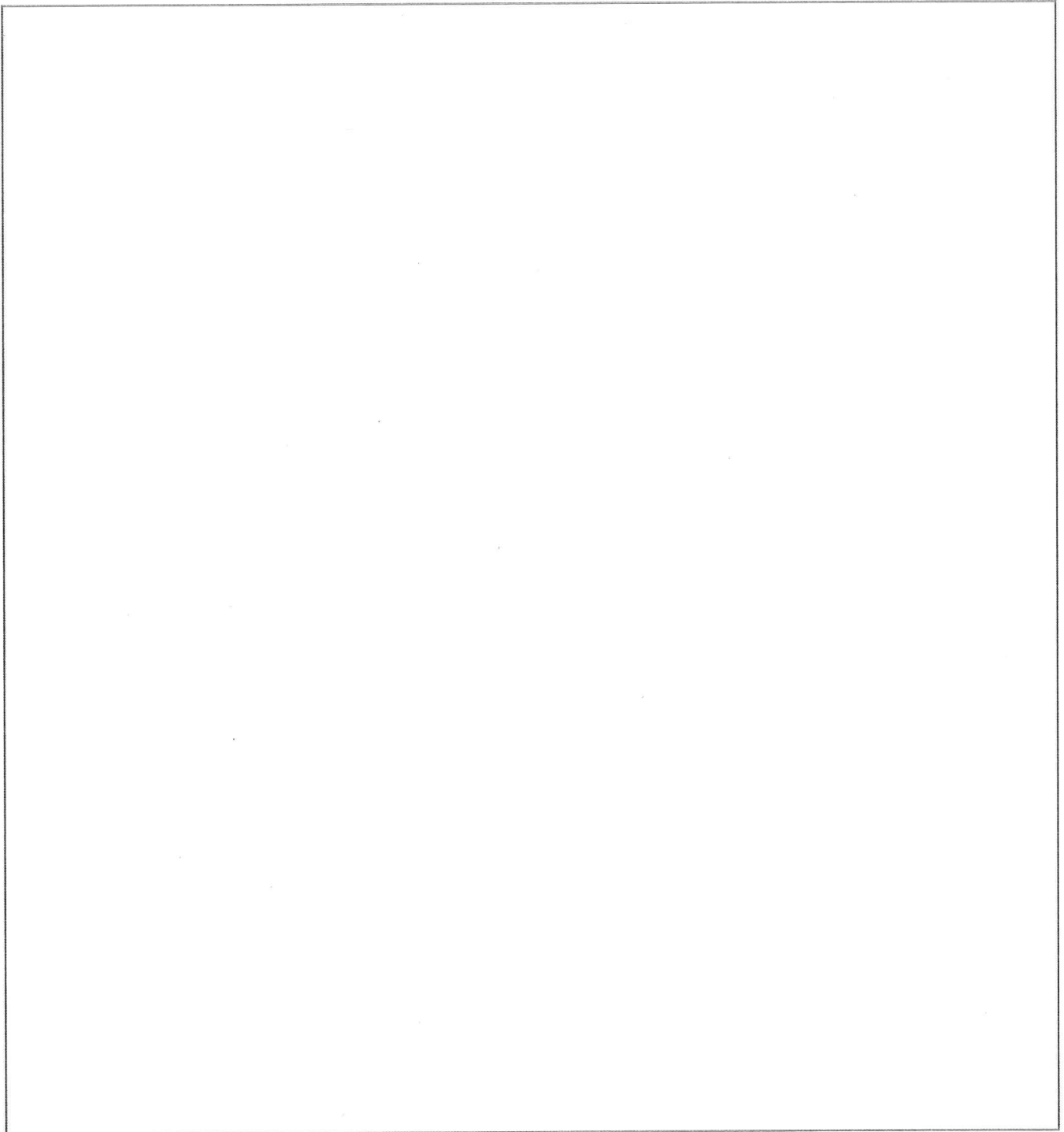
- 2.1 The *Contract* supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the *Work*, including the bidding documents that are not expressly listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS.
- 2.2 The *Contract* may be amended only as provided in the *Contract Documents*.

ARTICLE A-3 CONTRACT DOCUMENTS

3.1 The following are the *Contract Documents* referred to in Article A-1 of the Agreement - THE WORK:

- Agreement between *Owner* and *Contractor*
- Definitions
- The General Conditions of the Unit Price Contract

*



* (Insert here, attaching additional pages if required, a list identifying all other Contract Documents e.g. supplementary conditions; information documents; specifications, giving a list of contents with section numbers and titles, number of pages and date; material finishing schedules; drawings, giving drawing number, title, date, revision date or mark; addenda, giving title, number, date)

ARTICLE A-4 CONTRACT PRICE

4.1 The *Schedule of Prices* forms the basis for determining the *Contract Price*. Quantities for *Unit Price* items in the *Schedule of Prices* are estimated.

Schedule of Prices					
Item No.	Description of Work	* Unit of Measure	* Estimated Quantity (EQ)	Unit Price (UP)	Amount (EQ x UP)
Page Subtotal Carried Forward from Page					\$
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
Page Sub-total					\$

* Lump sum items are denoted as lump sum (LS) as the unit of measure and have a quantity of one (1).

Page of

Schedule of Prices					
Item No.	Description of Work	* Unit of Measure	* Estimated Quantity (EQ)	Unit Price (UP)	Amount (EQ x UP)
Page Subtotal Carried Forward from Page					\$
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
Total Amount					\$

* Lump sum items are denoted as lump sum (LS) as the unit of measure and have a quantity of one (1).

Page of

4.2 The estimated *Contract Price*, which is the total amount indicated in the *Schedule of Prices*, and which excludes *Value Added Taxes*, is:

/100 dollars \$

4.3 *Value Added Taxes* (of %) payable by the *Owner* to the *Contractor*, based on the estimated *Contract Price*, are:

/100 dollars \$

4.4 Total estimated amount payable by the *Owner* to the *Contractor* for the construction of the *Work* is:

/100 dollars \$

4.5 These amounts shall be subject to adjustments as provided in the *Contract Documents*.

4.6 All amounts are in Canadian funds.

ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents*, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a holdback of percent (%), the *Owner* shall:

- .1 make progress payments to the *Contractor* on account of the *Contract Price* when due in the amount certified by the *Consultant* together with such *Value Added Taxes* as may be applicable to such payments, and
- .2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment, and
- .3 upon the issuance of the final certificate for payment, pay to the *Contractor* the unpaid balance of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payment.

5.2 In the event of loss or damage occurring where payment becomes due under the property and boiler insurance policies, payments shall be made to the *Contractor* in accordance with the provisions of GC 11.1 – INSURANCE.

5.3 Interest

- .1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:
 - (1) 2% per annum above the prime rate for the first 60 days.
 - (2) 4% per annum above the prime rate after the first 60 days.Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by

(Insert name of chartered lending institution whose prime rate is to be used)

- for prime business loans as it may change from time to time.
- .2 Interest shall apply at the rate and in the manner prescribed by paragraph 5.3.1 of this Article on the settlement amount of any claim in dispute that is resolved either pursuant to Part 8 of the General Conditions – DISPUTE RESOLUTION or otherwise, from the date the amount would have been due and payable under the *Contract*, had it not been in dispute, until the date it is paid.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

- 6.1 *Notices in Writing* will be addressed to the recipient at the address set out below. The delivery of a *Notice in Writing* will be by hand, by courier, by prepaid first class mail, or by facsimile or other form of electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender. A *Notice in Writing* delivered by one party in accordance with this *Contract* will be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by mail it shall be deemed to have been received five calendar days after the date on which it was mailed, provided that if either such day is not a *Working Day*, then the *Notice in Writing* shall be deemed to have been received on the *Working Day* next following such day. A *Notice in Writing* sent by facsimile or other form of electronic communication shall be deemed to have been received on the date of its transmission provided that if such day is not a *Working Day* or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it shall be deemed to have been received at the opening of business at the place of receipt on the first *Working Day* next following the transmission thereof. An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this Article.

Owner

*name of Owner**

address

Facsimile number

e-mail address

Contractor

*name of Contractor**

address

Facsimile number

e-mail address

Consultant

*name of Consultant**

address

Facsimile number

e-mail address

** If it is intended that the notice must be received by a specific individual, that individual's name shall be indicated.*

ARTICLE A-7 LANGUAGE OF THE CONTRACT

- 7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English/French* language shall prevail.

* *Complete this statement by striking out inapplicable term.*

- 7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

ARTICLE A-8 SUCCESSION

8.1 The *Contract* shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors, and assigns.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

WITNESS

signature

name of person signing

signature

name of person signing

WITNESS

signature

name of person signing

signature

name of person signing

OWNER

name of owner

signature

name and title of person signing

signature

name and title of person signing

CONTRACTOR

name of Contractor

signature

name and title of person signing

signature

name and title of person signing

N.B. Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:

- (a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or*
- (b) the affixing of a corporate seal, this Agreement should be properly sealed.*

DEFINITIONS

The following Definitions shall apply to all *Contract Documents*.

Change Directive

A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon an adjustment in *Contract Price* and *Contract Time*.

Change Order

A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:

- a change in the *Work*;
- the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
- the extent of the adjustment in the *Contract Time*, if any.

Construction Equipment

Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.

Consultant

The *Consultant* is the person or entity engaged by the *Owner* and identified as such in the Agreement. The *Consultant* is the Architect, the Engineer or entity licensed to practise in the province or territory of the *Place of the Work*. The term *Consultant* means the *Consultant* or the *Consultant's* authorized representative.

Contract

The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.

Contract Documents

The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement - CONTRACT DOCUMENTS and amendments agreed upon between the parties.

Contract Price

The *Contract Price* is the sum of the products of each *Unit Price* stated in the *Schedule of Prices* multiplied by the appropriate actual quantity of each *Unit Price* item that is incorporated in or made necessary by the *Work*, plus lump sums, if any, and allowances, if any, stated in the *Schedule of Prices*.

Contract Time

The *Contract Time* is the time stipulated in paragraph 1.3 of Article A-1 of the Agreement - THE WORK from commencement of the *Work* to *Substantial Performance of the Work*.

Contractor

The *Contractor* is the person or entity identified as such in the Agreement. The term *Contractor* means the *Contractor* or the *Contractor's* authorized representative as designated to the *Owner* in writing.

Drawings

The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location and dimensions of the *Work*, generally including plans, elevations, sections, details, and diagrams.

Notice in Writing

A *Notice in Writing*, where identified in the *Contract Documents*, is a written communication between the parties or between them and the *Consultant* that is transmitted in accordance with the provisions of Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

Owner

The *Owner* is the person or entity identified as such in the Agreement. The term *Owner* means the *Owner* or the *Owner's* authorized agent or representative as designated to the *Contractor* in writing, but does not include the *Consultant*.

Place of the Work

The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

Product

Product or Products means material, machinery, equipment, and fixtures forming the *Work*, but does not include *Construction Equipment*.

Project

The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.

Provide

Provide means to supply and install.

Schedule of Prices

The *Schedule of Prices* is the schedule included in Article A-4 - CONTRACT PRICE and, subject to adjustments as provided in the *Contract Documents*, identifies:

- the items of work;
- the units of measure, estimated quantity, and *Unit Price* for each *Unit Price* item;
- the price for each lump sum item, if any; and
- allowances, if any.

Shop Drawings

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the *Work*.

Specifications

The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, quality, and the services necessary for the performance of the *Work*.

Subcontractor

A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work* at the *Place of the Work*.

Substantial Performance of the Work

Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*. If such legislation is not in force or does not contain such definition, or if the *Work* is governed by the Civil Code of Quebec, *Substantial Performance of the Work* shall have been reached when the *Work* is ready for use or is being used for the purpose intended and is so certified by the *Consultant*.

Supplemental Instruction

A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.

Supplier

A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products*.

Temporary Work

Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.

Unit Price

A *Unit Price* is the amount payable for a single *Unit Price* item as stated in the *Schedule of Prices*.

Value Added Taxes

Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which, have been imposed on the *Contractor* by the tax legislation.

Work

The *Work* means the total construction and related services required by the *Contract Documents*.

Working Day

Working Day means a day other than a Saturday, Sunday, statutory holiday or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

GENERAL CONDITIONS OF THE UNIT PRICE CONTRACT

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

- 1.1.1 The intent of the *Contract Documents* is to include the labour, *Products* and services necessary for the performance of the *Work* by the *Contractor* in accordance with these documents. It is not intended, however, that the *Contractor* shall supply products or perform work not consistent with, not covered by, or not properly inferable from the *Contract Documents*.
- 1.1.2 Nothing contained in the *Contract Documents* shall create any contractual relationship between:
- .1 the *Owner* and a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.
 - .2 the *Consultant* and the *Contractor*, a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.
- 1.1.3 The *Contract Documents* are complementary, and what is required by any one shall be as binding as if required by all.
- 1.1.4 Words and abbreviations which have well known technical or trade meanings are used in the *Contract Documents* in accordance with such recognized meanings.
- 1.1.5 References in the *Contract Documents* to the singular shall be considered to include the plural as the context requires.
- 1.1.6 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*.
- 1.1.7 If there is a conflict within the *Contract Documents*:
- .1 the order of priority of documents, from highest to lowest, shall be
 - the Agreement between the *Owner* and the *Contractor*,
 - the Definitions,
 - Supplementary Conditions,
 - the General Conditions,
 - Division 1 of the *Specifications*,
 - technical *Specifications*,
 - material and finishing schedules,
 - the *Drawings*.
 - .2 *Drawings* of larger scale shall govern over those of smaller scale of the same date.
 - .3 dimensions shown on *Drawings* shall govern over dimensions scaled from *Drawings*.
 - .4 later dated documents shall govern over earlier documents of the same type.
- 1.1.8 The *Owner* shall provide the *Contractor*, without charge, sufficient copies of the *Contract Documents* to perform the *Work*.
- 1.1.9 *Specifications*, *Drawings*, models, and copies thereof furnished by the *Consultant* are and shall remain the *Consultant's* property, with the exception of the signed *Contract* sets, which shall belong to each party to the *Contract*. All *Specifications*, *Drawings* and models furnished by the *Consultant* are to be used only with respect to the *Work* and are not to be used on other work. These *Specifications*, *Drawings* and models are not to be copied or altered in any manner without the written authorization of the *Consultant*.
- 1.1.10 Models furnished by the *Contractor* at the *Owner's* expense are the property of the *Owner*.

GC 1.2 LAW OF THE CONTRACT

- 1.2.1 The law of the *Place of the Work* shall govern the interpretation of the *Contract*.

GC 1.3 RIGHTS AND REMEDIES

- 1.3.1 Except as expressly provided in the *Contract Documents*, the duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

- 1.3.2 No action or failure to act by the *Owner*, *Consultant* or *Contractor* shall constitute a waiver of any right or duty afforded any of them under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

GC 1.4 ASSIGNMENT

- 1.4.1 Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.1 AUTHORITY OF THE CONSULTANT

- 2.1.1 The *Consultant* will have authority to act on behalf of the *Owner* only to the extent provided in the *Contract Documents*, unless otherwise modified by written agreement as provided in paragraph 2.1.2.
- 2.1.2 The duties, responsibilities and limitations of authority of the *Consultant* as set forth in the *Contract Documents* shall be modified or extended only with the written consent of the *Owner*, the *Contractor* and the *Consultant*.
- 2.1.3 If the *Consultant's* employment is terminated, the *Owner* shall immediately appoint or reappoint a *Consultant* against whom the *Contractor* makes no reasonable objection and whose status under the *Contract Documents* shall be that of the former *Consultant*.

GC 2.2 ROLE OF THE CONSULTANT

- 2.2.1 The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents*.
- 2.2.2 The *Consultant* will visit the *Place of the Work* at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work and to determine if the *Work* is proceeding in general conformity with the *Contract Documents*.
- 2.2.3 If the *Owner* and the *Consultant* agree, the *Consultant* will provide at the *Place of the Work*, one or more project representatives to assist in carrying out the *Consultant's* responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in writing to the *Contractor*.
- 2.2.4 The *Consultant* will promptly inform the *Owner* of the date of receipt of the *Contractor's* applications for payment as provided in paragraph 5.3.1.1 of GC 5.3 – PROGRESS PAYMENT.
- 2.2.5 Based on the *Consultant's* observations and review of the *Contractor's* applications for payment, the *Consultant* will determine the amounts owing to the *Contractor* under the *Contract* and will issue certificates for payment as provided in Article A-5 of the Agreement - PAYMENT, GC 5.3 - PROGRESS PAYMENT and GC 5.7 - FINAL PAYMENT.
- 2.2.6 The *Consultant* will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the *Work* in accordance with the applicable construction safety legislation, other regulations or general construction practice. The *Consultant* will not be responsible for the *Contractor's* failure to carry out the *Work* in accordance with the *Contract Documents*. The *Consultant* will not have control over, charge of or be responsible for the acts or omissions of the *Contractor*, *Subcontractors*, *Suppliers*, or their agents, employees or any other persons performing portions of the *Work*.
- 2.2.7 Except with respect to GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER, the *Consultant* will be, in the first instance, the interpreter of the requirements of the *Contract Documents*.
- 2.2.8 Matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* shall be initially referred in writing to the *Consultant* by the party raising the question for interpretations and findings and copied to the other party.
- 2.2.9 Interpretations and findings of the *Consultant* shall be consistent with the intent of the *Contract Documents*. In making such interpretations and findings the *Consultant* will not show partiality to either the *Owner* or the *Contractor*.
- 2.2.10 The *Consultant's* interpretations and findings will be given in writing to the parties within a reasonable time.
- 2.2.11 With respect to claims for a change in *Contract Price*, the *Consultant* will make findings as set out in GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

- 2.2.12 The *Consultant* will have authority to reject work which in the *Consultant's* opinion does not conform to the requirements of the *Contract Documents*. Whenever the *Consultant* considers it necessary or advisable, the *Consultant* will have authority to require inspection or testing of work, whether or not such work is fabricated, installed or completed. However, neither the authority of the *Consultant* to act nor any decision either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the *Consultant* to the *Contractor*, *Subcontractors*, *Suppliers*, or their agents, employees or other persons performing any of the *Work*.
- 2.2.13 During the progress of the *Work* the *Consultant* will furnish *Supplemental Instructions* to the *Contractor* with reasonable promptness or in accordance with a schedule for such instructions agreed to by the *Consultant* and the *Contractor*.
- 2.2.14 The *Consultant* will review and take appropriate action upon *Shop Drawings*, samples and other *Contractor's* submittals, in accordance with the *Contract Documents*.
- 2.2.15 The *Consultant* will prepare *Change Orders* and *Change Directives* as provided in GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.
- 2.2.16 The *Consultant* will conduct reviews of the *Work* to determine the date of *Substantial Performance of the Work* as provided in GC 5.4 - SUBSTANTIAL PERFORMANCE OF THE WORK.
- 2.2.17 All certificates issued by the *Consultant* will be to the best of the *Consultant's* knowledge, information and belief. By issuing any certificate, the *Consultant* does not guarantee the *Work* is correct or complete.
- 2.2.18 The *Consultant* will receive and review written warranties and related documents required by the *Contract* and provided by the *Contractor* and will forward such warranties and documents to the *Owner* for the *Owner's* acceptance.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

- 2.3.1 The *Owner* and the *Consultant* shall have access to the *Work* at all times. The *Contractor* shall provide sufficient, safe and proper facilities at all times for the review of the *Work* by the *Consultant* and the inspection of the *Work* by authorized agencies. If parts of the *Work* are in preparation at locations other than the *Place of the Work*, the *Owner* and the *Consultant* shall be given access to such work whenever it is in progress.
- 2.3.2 If work is designated for measurement for payment, tests, inspections or approvals in the *Contract Documents*, or by the *Consultant's* instructions, or by the laws or ordinances of the *Place of the Work*, the *Contractor* shall give the *Consultant* reasonable notification of when the work will be ready for measurements, tests, inspections and approvals. The *Contractor* shall arrange for and shall give the *Consultant* reasonable notification of the date and time of inspections by other authorities.
- 2.3.3 The *Contractor* shall furnish promptly to the *Consultant* two copies of certificates and inspection reports relating to the *Work*.
- 2.3.4 If the *Contractor* covers, or permits to be covered, work that has been designated for measurement for payment, tests, inspections or approvals before such measurements, tests, inspections or approvals are made, given or completed, the *Contractor* shall, if so directed, uncover such work, have the measurements, tests, inspections, or approvals satisfactorily completed, and make good covering work at the *Contractor's* expense.
- 2.3.5 The *Consultant* may order any portion or portions of the *Work* to be examined to confirm that such work is in accordance with the requirements of the *Contract Documents*. If the work is not in accordance with the requirements of the *Contract Documents*, the *Contractor* shall correct the work and pay the cost of examination and correction. If the work is in accordance with the requirements of the *Contract Documents*, the *Owner* shall pay the cost of examination and restoration.
- 2.3.6 The *Contractor* shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the *Contract Documents* to be performed by the *Contractor* or is designated by the laws or ordinances applicable to the *Place of the Work*.
- 2.3.7 The *Contractor* shall pay the cost of samples required for any test or inspection to be performed by the *Consultant* or the *Owner* if such test or inspection is designated in the *Contract Documents*.

GC 2.4 DEFECTIVE WORK

- 2.4.1 The *Contractor* shall promptly correct defective work that has been rejected by the *Consultant* as failing to conform to the *Contract Documents* whether or not the defective work has been incorporated in the *Work* and whether or not the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*.
- 2.4.2 The *Contractor* shall make good promptly other contractors' work destroyed or damaged by such removals or replacements at the *Contractor's* expense.

- 2.4.3 If, in the opinion of the *Consultant*, it is not expedient to correct defective work or work not performed as provided in the *Contract Documents*, the *Owner* may deduct from the amount otherwise due to the *Contractor* the difference in value between the work as performed and that called for by the *Contract Documents*. If the *Owner* and the *Contractor* do not agree on the difference in value, they shall refer the matter to the *Consultant* for a determination.

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

- 3.1.1 The *Contractor* shall have total control of the *Work* and shall effectively direct and supervise the *Work* so as to ensure conformity with the *Contract Documents*.
- 3.1.2 The *Contractor* shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the *Work* under the *Contract*.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

- 3.2.1 The *Owner* reserves the right to award separate contracts in connection with other parts of the *Project* to other contractors and to perform work with own forces.
- 3.2.2 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner's* own forces, the *Owner* shall:
- .1 provide for the co-ordination of the activities and work of other contractors and *Owner's* own forces with the *Work* of the *Contract*;
 - .2 assume overall responsibility for compliance with the applicable health and construction safety legislation at the *Place of the Work*;
 - .3 enter into separate contracts with other contractors under conditions of contract which are compatible with the conditions of the *Contract*;
 - .4 ensure that insurance coverage is provided to the same requirements as are called for in GC 11.1 - INSURANCE and co-ordinate such insurance with the insurance coverage of the *Contractor* as it affects the *Work*; and
 - .5 take all reasonable precautions to avoid labour disputes or other disputes on the *Project* arising from the work of other contractors or the *Owner's* own forces.
- 3.2.3 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner's* own forces, the *Contractor* shall:
- .1 afford the *Owner* and other contractors reasonable opportunity to store their products and execute their work;
 - .2 cooperate with other contractors and the *Owner* in reviewing their construction schedules; and
 - .3 promptly report to the *Consultant* in writing any apparent deficiencies in the work of other contractors or of the *Owner's* own forces, where such work affects the proper execution of any portion of the *Work*, prior to proceeding with that portion of the *Work*.
- 3.2.4 Where the *Contract Documents* identify work to be performed by other contractors or the *Owner's* own forces, the *Contractor* shall co-ordinate and schedule the *Work* with the work of other contractors and the *Owner's* own forces as specified in the *Contract Documents*.
- 3.2.5 Where a change in the *Work* is required as a result of the co-ordination and integration of the work of other contractors or *Owner's* own forces with the *Work*, the changes shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.
- 3.2.6 Disputes and other matters in question between the *Contractor* and other contractors shall be dealt with as provided in Part 8 of the General Conditions - DISPUTE RESOLUTION provided the other contractors have reciprocal obligations. The *Contractor* shall be deemed to have consented to arbitration of any dispute with any other contractor whose contract with the *Owner* contains a similar agreement to arbitrate.

GC 3.3 TEMPORARY WORK

- 3.3.1 The *Contractor* shall have the sole responsibility for the design, erection, operation, maintenance, and removal of *Temporary Work*.
- 3.3.2 The *Contractor* shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in paragraph 3.3.1 where required by law or by the *Contract Documents* and in all cases where such *Temporary Work* is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

- 3.3.3 Notwithstanding the provisions of GC 3.1 - CONTROL OF THE WORK, paragraph 3.3.1 and paragraph 3.3.2 or provisions to the contrary elsewhere in the *Contract Documents* where such *Contract Documents* include designs for *Temporary Work* or specify a method of construction in whole or in part, such designs or methods of construction shall be considered to be part of the design of the *Work* and the *Contractor* shall not be held responsible for that part of the design or the specified method of construction. The *Contractor* shall, however, be responsible for the execution of such design or specified method of construction in the same manner as for the execution of the *Work*.

GC 3.4 DOCUMENT REVIEW

- 3.4.1 The *Contractor* shall review the *Contract Documents* and shall report promptly to the *Consultant* any error, inconsistency or omission the *Contractor* may discover. Such review by the *Contractor* shall be to the best of the *Contractor's* knowledge, information and belief and in making such review the *Contractor* does not assume any responsibility to the *Owner* or the *Consultant* for the accuracy of the review. The *Contractor* shall not be liable for damage or costs resulting from such errors, inconsistencies or omissions in the *Contract Documents*, which the *Contractor* did not discover. If the *Contractor* does discover any error, inconsistency or omission in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received corrected or missing information from the *Consultant*.

GC 3.5 CONSTRUCTION SCHEDULE

- 3.5.1 The *Contractor* shall:
- .1 prepare and submit to the *Owner* and the *Consultant* prior to the first application for payment, a construction schedule that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*;
 - .2 monitor the progress of the *Work* relative to the construction schedule and update the schedule on a monthly basis or as stipulated by the *Contract Documents*; and
 - .3 advise the *Consultant* of any revisions required to the schedule as the result of extensions of the *Contract Time* as provided in Part 6 of the General Conditions - CHANGES IN THE WORK.

GC 3.6 SUPERVISION

- 3.6.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representative shall not be changed except for valid reason.
- 3.6.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor's* appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

- 3.7.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:
- .1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;
 - .2 incorporate the terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and
 - .3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.
- 3.7.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.
- 3.7.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.
- 3.7.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the differences occasioned by such required change.
- 3.7.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.

- 3.7.6 The *Owner*, through the *Consultant*, may provide to a *Subcontractor* or *Supplier* information as to the percentage of the *Subcontractor's* or *Supplier's* work which has been certified for payment.

GC 3.8 LABOUR AND PRODUCTS

- 3.8.1 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.
- 3.8.2 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.
- 3.8.3 The *Contractor* shall maintain good order and discipline among the *Contractor's* employees engaged on the *Work* and shall not employ on the *Work* anyone not skilled in the tasks assigned.

GC 3.9 DOCUMENTS AT THE SITE

- 3.9.1 The *Contractor* shall keep one copy of current *Contract Documents*, submittals, reports, and records of meetings at the *Place of the Work*, in good order and available to the *Owner* and the *Consultant*.

GC 3.10 SHOP DRAWINGS

- 3.10.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.
- 3.10.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of other contractors.
- 3.10.3 Upon request of the *Contractor* or the *Consultant*, they shall jointly prepare a schedule of the dates for provision, review and return of *Shop Drawings*.
- 3.10.4 The *Contractor* shall provide *Shop Drawings* in the form specified, or if not specified, as directed by the *Consultant*.
- 3.10.5 *Shop Drawings* provided by the *Contractor* to the *Consultant* shall indicate by stamp, date and signature of the person responsible for the review that the *Contractor* has reviewed each one of them.
- 3.10.6 The *Consultant's* review is for conformity to the design concept and for general arrangement only.
- 3.10.7 *Shop Drawings* which require approval of any legally constituted authority having jurisdiction shall be provided to such authority by the *Contractor* for approval.
- 3.10.8 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:
- 1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and
 - 2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.
- 3.10.9 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.
- 3.10.10 The *Consultant's* review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.
- 3.10.11 The *Contractor* shall provide revised *Shop Drawings* to correct those which the *Consultant* rejects as inconsistent with the *Contract Documents*, unless otherwise directed by the *Consultant*. The *Contractor* shall notify the *Consultant* in writing of any revisions to the *Shop Drawings* other than those requested by the *Consultant*.
- 3.10.12 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

GC 3.11 USE OF THE WORK

- 3.11.1 The *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of employees and *Subcontractors* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.
- 3.11.2 The *Contractor* shall not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety of the *Work*.

GC 3.12 CUTTING AND REMEDIAL WORK

- 3.12.1 The *Contractor* shall perform the cutting and remedial work required to make the affected parts of the *Work* come together properly.
- 3.12.2 The *Contractor* shall co-ordinate the *Work* to ensure that the cutting and remedial work is kept to a minimum.
- 3.12.3 Should the *Owner*, the *Consultant*, other contractors or anyone employed by them be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided in GC 6.1 – OWNER’S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.
- 3.12.4 Cutting and remedial work shall be performed by specialists familiar with the *Products* affected and shall be performed in a manner to neither damage nor endanger the *Work*.

GC 3.13 CLEANUP

- 3.13.1 The *Contractor* shall maintain the *Work* in a safe and tidy condition and free from the accumulation of waste products and debris, other than that caused by the *Owner*, other contractors or their employees.
- 3.13.2 Before applying for *Substantial Performance of the Work* as provided in GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK, the *Contractor* shall remove waste products and debris, other than that resulting from the work of the *Owner*, other contractors or their employees, and shall leave the *Place of the Work* clean and suitable for use or occupancy by the *Owner*. The *Contractor* shall remove products, tools, *Construction Equipment*, and *Temporary Work* not required for the performance of the remaining work.
- 3.13.3 Prior to application for the final payment, the *Contractor* shall remove any remaining products, tools, *Construction Equipment*, *Temporary Work*, and waste products and debris, other than those resulting from the work of the *Owner*, other contractors or their employees.

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

- 4.1.1 The *Contract Price* includes the cash allowances, if any, stated in the *Contract Documents*. The scope of work or costs included in such cash allowances shall be as described in the *Contract Documents*.
- 4.1.2 The *Contract Price*, and not the cash allowances, includes the *Contractor's* overhead and profit in connection with such cash allowances.
- 4.1.3 Expenditures under cash allowances shall be authorized by the *Owner* through the *Consultant*.
- 4.1.4 Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, the *Contractor* shall be compensated for the excess incurred and substantiated plus an amount for overhead and profit on the excess as set out in the *Contract Documents*. Where the actual cost of the *Work* under any cash allowance is less than the amount of the allowance, the *Owner* shall be credited for the unexpended portion of the cash allowance, but not for the *Contractor's* overhead and profit on such amount. Multiple cash allowances shall not be combined for the purpose of calculating the foregoing.
- 4.1.5 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the amount of each cash allowance and the actual cost of the work under that cash allowance.
- 4.1.6 The value of the work performed under a cash allowance is eligible to be included in progress payments.
- 4.1.7 The *Contractor* and the *Consultant* shall jointly prepare a schedule that shows when the *Consultant* and *Owner* must authorize ordering of items called for under cash allowances to avoid delaying the progress of the *Work*.

GC 4.2 CONTINGENCY ALLOWANCE

- 4.2.1 The *Contract Price* includes the contingency allowance, if any, stated in the *Contract Documents*.
- 4.2.2 The contingency allowance includes the *Contractor's* overhead and profit in connection with such contingency allowance.
- 4.2.3 Expenditures under the contingency allowance shall be authorized and valued as provided in GC 6.1 – OWNER’S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.
- 4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.2.3 and the contingency allowance.

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

- 5.1.1 The *Owner* shall, at the request of the *Contractor*, before signing the *Contract*, and promptly from time to time thereafter, furnish to the *Contractor* reasonable evidence that financial arrangements have been made to fulfill the *Owner's* obligations under the *Contract*.
- 5.1.2 The *Owner* shall give the *Contractor Notice in Writing* of any material change in the *Owner's* financial arrangements to fulfill the *Owner's* obligations under the *Contract* during the performance of the *Contract*.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

- 5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement - PAYMENT may be made monthly as the *Work* progresses.
- 5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties.
- 5.2.3 As of the last day of the payment period, the amount claimed shall be:
 - 1. the value of *Unit Price* work performed, being the sum of the products of each *Unit Price* stated in the *Schedule of Prices* multiplied by the appropriate actual quantity of each *Unit Price* item that is incorporated in or made necessary by the *Work*; plus
 - 2. the value of lump sum work performed, proportionate to the amount of the lump sum item, plus
 - 3. the value of *Products* delivered to the *Place of the Work*.
- 5.2.4 The *Contractor* shall submit to the *Consultant*, at least 15 calendar days before the first application for payment, a schedule of values for the lump sum items of work, aggregating the total amount of each lump sum item, so as to facilitate evaluation of applications for payment.
- 5.2.5 The schedule of values for lump sum items of work shall be made out in such form and supported by such evidence as the *Consultant* may reasonably direct and when accepted by the *Consultant*, shall be used as the basis for applications for payment for lump sum items, unless it is found to be in error.
- 5.2.6 The *Contractor* shall include with each application for payment:
 - 1. a statement based on the schedule of values for the lump sum items of work; and
 - 2. quantity measurements and other evidence as requested by the *Consultant* for each *Unit Price* item.
- 5.2.7 Applications for payment for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall be supported by such evidence as the *Consultant* may reasonably require to establish the value and delivery of the *Products*.

GC 5.3 PROGRESS PAYMENT

- 5.3.1 After receipt by the *Consultant* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 - APPLICATIONS FOR PROGRESS PAYMENT:
 - .1 the *Consultant* will promptly inform the *Owner* of the date of receipt of the *Contractor's* application for payment,
 - .2 the *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 10 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* amends the application, the *Consultant* will promptly advise the *Contractor* in writing giving reasons for the amendment,
 - .3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement - PAYMENT on or before 20 calendar days after the later of:
 - receipt by the *Consultant* of the application for payment, or
 - the last day of the monthly payment period for which the application for payment is made.
- 5.3.2 Where the basis of payment for an item is by *Unit Price*, quantities in progress payments shall be considered approximate until all work required by that *Unit Price* item is complete.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

- 5.4.1 When the *Contractor* considers that the *Work* is substantially performed, or if permitted by the lien legislation applicable to the *Place of the Work* a designated portion thereof which the *Owner* agrees to accept separately is substantially performed, the *Contractor* shall, within one Working Day, deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for a review by the *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.
- 5.4.2 The *Consultant* will review the *Work* to verify the validity of the application and shall promptly, and in any event, no later than 20 calendar days after receipt of the *Contractor's* list and application:
- .1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or
 - .2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.
- 5.4.3 Immediately following the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for finishing the *Work*.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- 5.5.1 After the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor* shall:
- .1 submit an application for payment of the holdback amount,
 - .2 submit CCDC 9A 'Statutory Declaration' to state that all accounts for labour, subcontracts, *Products*, *Construction Equipment*, and other indebtedness which may have been incurred by the *Contractor* in the *Substantial Performance of the Work* and for which the *Owner* might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute.
- 5.5.2 After the receipt of an application for payment from the *Contractor* and the statement as provided in paragraph 5.5.1, the *Consultant* will issue a certificate for payment of the holdback amount.
- 5.5.3 Where the holdback amount required by the applicable lien legislation has not been placed in a separate holdback account, the *Owner* shall, 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.
- 5.5.4 In the common law jurisdictions, the holdback amount authorized by the certificate for payment of the holdback amount is due and payable on the calendar day following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*. Where lien legislation does not exist or apply, the holdback amount shall be due and payable in accordance with other legislation, industry practice or provisions which may be agreed to between the parties. The *Owner* may retain out of the holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the lien legislation applicable to the *Place of the Work*, other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.
- 5.5.5 In the Province of Quebec, the holdback amount authorized by the certificate for payment of the holdback amount is due and payable 30 calendar days after the issuance of the certificate. The *Owner* may retain out of the holdback amount any sums required to satisfy any legal hypothecs that have been taken, or could be taken, against the *Work* or other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

- 5.6.1 In the common law jurisdictions, where legislation permits and where, upon application by the *Contractor*, the *Consultant* has certified that the work of a *Subcontractor* or *Supplier* has been performed prior to *Substantial Performance of the Work*, the *Owner* shall pay the *Contractor* the holdback amount retained for such subcontract work, or the *Products* supplied by such *Supplier*, on the first calendar day following the expiration of the holdback period for such work stipulated in the lien legislation applicable to the *Place of the Work*. The *Owner* may retain out of the holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the lien legislation applicable to the *Place of the Work*, other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

- 5.6.2 In the Province of Quebec, where, upon application by the *Contractor*, the *Consultant* has certified that the work of a *Subcontractor* or *Supplier* has been performed prior to *Substantial Performance of the Work*, the *Owner* shall pay the *Contractor* the holdback amount retained for such subcontract work, or the *Products* supplied by such *Supplier*, no later than 30 calendar days after such certification by the *Consultant*. The *Owner* may retain out of the holdback amount any sums required to satisfy any legal hypothecs that have been taken, or could be taken, against the *Work* or other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.
- 5.6.3 Notwithstanding the provisions of the preceding paragraphs, and notwithstanding the wording of such certificates, the *Contractor* shall ensure that such subcontract work or *Products* are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when such certificates were issued.

GC 5.7 FINAL PAYMENT

- 5.7.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment.
- 5.7.2 The *Consultant* will, no later than 10 calendar days after the receipt of an application from the *Contractor* for final payment, review the *Work* to verify the validity of the application and advise the *Contractor* in writing that the application is valid or give reasons why it is not valid.
- 5.7.3 When the *Consultant* finds the *Contractor's* application for final payment valid, the *Consultant* will promptly issue a final certificate for payment.
- 5.7.4 Subject to the provision of paragraph 10.4.1 of GC 10.4 - WORKERS' COMPENSATION, and any lien legislation applicable to the *Place of the Work*, the *Owner* shall, no later than 5 calendar days after the issuance of a final certificate for payment, pay the *Contractor* as provided in Article A-5 of the Agreement - PAYMENT.

GC 5.8 WITHHOLDING OF PAYMENT

- 5.8.1 If because of climatic or other conditions reasonably beyond the control of the *Contractor*, there are items of work that cannot be performed, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such remaining work.

GC 5.9 NON-CONFORMING WORK

- 5.9.1 No payment by the *Owner* under the *Contract* nor partial or entire use or occupancy of the *Work* by the *Owner* shall constitute an acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents*.

PART 6 CHANGES IN THE WORK

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

- 6.1.1 The *Owner*, through the *Consultant*, without invalidating the *Contract*, may make:
- .1 changes in the *Work* consisting of additions, deletions or other revisions to the *Work* by *Change Order* or *Change Directive*, and
 - .2 changes to the *Contract Time* for the *Work*, or any part thereof, by *Change Order*.
- 6.1.2 The *Contractor* shall not perform a change in the *Work* without a *Change Order* or a *Change Directive*.

GC 6.2 CHANGE ORDER

- 6.2.1 When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall promptly present, in a form acceptable to the *Consultant*, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*.

- 6.2.2 The method of adjustment or the amount of adjustment to the *Contract Price* presented by the *Contractor* may be one of or a combination of the following:
- .1 Change to the estimated quantities for *Unit Price* items listed in the *Schedule of Prices* that are applicable to the change in the *Work*;
 - .2 Lump sum quotation for the change in the *Work*;
 - .3 *Unit Price* quotation for the change in the *Work*;
 - .4 Cost of the *Contractor's* actual expenditures attributable to the change plus a fee for the *Contractor's* overhead and profit as agreed by the parties;
 - .5 Cost of the *Contractor's* actual savings attributable to the change.
- 6.2.3 When the *Owner* and *Contractor* agree to the adjustments in the *Contract Price* and *Contract Time* or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a *Change Order*. The value of the work performed as the result of a *Change Order* shall be included in the application for progress payment.

GC 6.3 CHANGE DIRECTIVE

- 6.3.1 If the *Owner* requires the *Contractor* to proceed with a change in the *Work* prior to the *Owner* and the *Contractor* agreeing upon the corresponding adjustment in *Contract Price* and *Contract Time*, the *Owner*, through the *Consultant*, shall issue a *Change Directive*.
- 6.3.2 A *Change Directive* shall only be used to direct a change in the *Work* which is within the general scope of the *Contract Documents*.
- 6.3.3 A *Change Directive* shall not be used to direct a change in the *Contract Time* only.
- 6.3.4 Upon receipt of a *Change Directive*, the *Contractor* shall proceed promptly with the change in the *Work*.
- 6.3.5 For the purpose of valuing *Change Directives*, changes in the *Work* that are not substitutions or otherwise related to each other shall not be grouped together in the same *Change Directive*.
- 6.3.6 The adjustment in the *Contract Price* for a change carried out by way of a *Change Directive* shall be determined on the basis of the cost of the *Contractor's* actual expenditures and savings attributable to the *Change Directive*, valued in accordance with paragraph 6.3.7 and as follows:
- .1 If the change results in a net increase in the *Contractor's* cost, the *Contract Price* shall be increased by the amount of the net increase in the *Contractor's* cost, plus the *Contractor's* percentage fee on such net increase.
 - .2 If the change results in a net decrease in the *Contractor's* cost, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor's* cost, without adjustment for the *Contractor's* percentage fee.
 - .3 The *Contractor's* fee shall be as specified in the *Contract Documents* or as otherwise agreed by the parties.
- 6.3.7 The cost of performing the work attributable to the *Change Directive* shall be limited to the actual cost of the following:
- .1 salaries, wages and benefits paid to personnel in the direct employ of the *Contractor* under a salary or wage schedule agreed upon by the *Owner* and the *Contractor*, or in the absence of such a schedule, actual salaries, wages and benefits paid under applicable bargaining agreement, and in the absence of a salary or wage schedule and bargaining agreement, actual salaries, wages and benefits paid by the *Contractor*, for personnel
 - (1) stationed at the *Contractor's* field office, in whatever capacity employed;
 - (2) engaged in expediting the production or transportation of material or equipment, at shops or on the road;
 - (3) engaged in the preparation or review of *Shop Drawings*, fabrication drawings, and coordination drawings; or
 - (4) engaged in the processing of changes in the *Work*.
 - .2 contributions, assessments or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada or Quebec Pension Plan, insofar as such cost is based on wages, salaries or other remuneration paid to employees of the *Contractor* and included in the cost of the work as provided in paragraphs 6.3.7.1;
 - .3 travel and subsistence expenses of the *Contractor's* personnel described in paragraphs 6.3.7.1;
 - .4 all *Products* including cost of transportation thereof;
 - .5 materials, supplies, *Construction Equipment*, *Temporary Work*, and hand tools not owned by the workers, including transportation and maintenance thereof, which are consumed in the performance of the *Work*; and cost less salvage value on such items used but not consumed, which remain the property of the *Contractor*;
 - .6 all tools and *Construction Equipment*, exclusive of hand tools used in the performance of the *Work*, whether rented from or provided by the *Contractor* or others, including installation, minor repairs and replacements, dismantling, removal, transportation, and delivery cost thereof;
 - .7 all equipment and services required for the *Contractor's* field office;
 - .8 deposits lost;

- .9 the amounts of all subcontracts;
 - .10 quality assurance such as independent inspection and testing services;
 - .11 charges levied by authorities having jurisdiction at the *Place of the Work*;
 - .12 royalties, patent licence fees and damages for infringement of patents and cost of defending suits therefor subject always to the *Contractor's* obligations to indemnify the *Owner* as provided in paragraph 10.3.1 of GC 10.3 - PATENT FEES;
 - .13 any adjustment in premiums for all bonds and insurance which the *Contractor* is required, by the *Contract Documents*, to purchase and maintain;
 - .14 any adjustment in taxes, other than *Value Added Taxes*, and duties for which the *Contractor* is liable;
 - .15 charges for long distance telephone and facsimile communications, courier services, expressage, and petty cash items incurred in relation to the performance of the *Work*;
 - .16 removal and disposal of waste products and debris; and
 - .17 safety measures and requirements.
- 6.3.8 Notwithstanding any other provisions contained in the General Conditions of the *Contract*, it is the intention of the parties that the cost of any item under any cost element referred to in paragraph 6.3.7 shall cover and include any and all costs or liabilities attributable to the *Change Directive* other than those which are the result of or occasioned by any failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor's* attention to the *Work*. Any cost due to failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor's* attention to the *Work* shall be borne by the *Contractor*.
- 6.3.9 The *Contractor* shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the work attributable to the *Change Directive* and shall provide the *Consultant* with copies thereof when requested.
- 6.3.10 For the purpose of valuing *Change Directives*, the *Owner* shall be afforded reasonable access to all of the *Contractor's* pertinent documents related to the cost of performing the work attributable to the *Change Directive*.
- 6.3.11 Pending determination of the final amount of a *Change Directive*, the undisputed value of the work performed as the result of a *Change Directive* is eligible to be included in progress payments.
- 6.3.12 If the *Owner* and *Contractor* do not agree on the proposed adjustment in the *Contract Time* attributable to the change in the *Work*, or the method of determining it, the adjustment shall be referred to the *Consultant* for determination.
- 6.3.13 When the *Owner* and the *Contractor* reach agreement on the adjustment to the *Contract Price* and to the *Contract Time*, this agreement shall be recorded in a *Change Order*.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

- 6.4.1 If the *Owner* or the *Contractor* discover conditions at the *Place of the Work* which are:
- .1 subsurface or otherwise concealed physical conditions which existed before the commencement of the *Work* which differ materially from those indicated in the *Contract Documents*; or
 - .2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the *Contract Documents*,
- then the observing party shall give *Notice in Writing* to the other party of such conditions before they are disturbed and in no event later than 5 *Working Days* after first observance of the conditions.
- 6.4.2 The *Consultant* will promptly investigate such conditions and make a finding. If the finding is that the conditions differ materially and this would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Consultant*, with the *Owner's* approval, will issue appropriate instructions for a change in the *Work* as provided in GC 6.2 - CHANGE ORDER or GC 6.3 - CHANGE DIRECTIVE.
- 6.4.3 If the *Consultant* finds that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* will report the reasons for this finding to the *Owner* and the *Contractor* in writing.
- 6.4.4 If such concealed or unknown conditions relate to toxic and hazardous substances and materials, artifacts and fossils, or mould, the parties will be governed by the provisions of GC 9.2 - TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS, GC 9.3 - ARTIFACTS AND FOSSILS and GC 9.5 - MOULD.

GC 6.5 DELAYS

- 6.5.1 If the *Contractor* is delayed in the performance of the *Work* by an action or omission of the *Owner*, *Consultant* or anyone employed or engaged by them directly or indirectly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.
- 6.5.2 If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.
- 6.5.3 If the *Contractor* is delayed in the performance of the *Work* by:
- .1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),
 - .2 fire, unusual delay by common carriers or unavoidable casualties,
 - .3 abnormally adverse weather conditions, or
 - .4 any cause beyond the *Contractor's* control other than one resulting from a default or breach of *Contract* by the *Contractor*,
- then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the *Owner*, *Consultant* or anyone employed or engaged by them directly or indirectly.
- 6.5.4 No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary.
- 6.5.5 If no schedule is made under paragraph 2.2.13 of GC 2.2 - ROLE OF THE CONSULTANT, then no request for extension shall be made because of failure of the *Consultant* to furnish instructions until 10 *Working Days* after demand for such instructions has been made.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

- 6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall give timely *Notice in Writing* of intent to claim to the other party and to the *Consultant*.
- 6.6.2 Upon commencement of the event or series of events giving rise to a claim, the party intending to make the claim shall:
- .1 take all reasonable measures to mitigate any loss or expense which may be incurred as a result of such event or series of events, and
 - .2 keep such records as may be necessary to support the claim.
- 6.6.3 The party making the claim shall submit within a reasonable time to the *Consultant* a detailed account of the amount claimed and the grounds upon which the claim is based.
- 6.6.4 Where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, at such intervals as the *Consultant* may reasonably require, submit further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.
- 6.6.5 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.
- 6.6.6 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION.

GC 6.7 QUANTITY VARIATIONS

- 6.7.1 The provisions of GC 6.7 - QUANTITY VARIATIONS apply to the estimated quantities identified in the *Schedule of Prices*, or where the estimated quantities have been amended by *Change Order*, the provisions apply to the amended estimated quantities.
- 6.7.2 The *Owner* or the *Contractor* may request an adjustment to a *Unit Price* contained in the *Schedule of Prices* provided the actual quantity of the *Unit Price* item in the *Schedule of Prices* exceeds or falls short of the estimated quantity by more than 15%.
- 6.7.3 Where the actual quantity exceeds the estimated quantity by more than 15%, a *Unit Price* adjusted pursuant to paragraph 6.7.2 shall apply only to the quantity that exceeds 115% of the estimated quantity.
- 6.7.4 Where the actual quantity falls short of the estimated quantity by more than 15%, a *Unit Price* adjusted pursuant to paragraph 6.7.2 shall apply to the actual quantity of the *Unit Price* item. The adjusted *Unit Price* shall not exceed a *Unit Price* that would cause the payment amount to exceed that derived from the original *Unit Price* and estimated quantity.
- 6.7.5 The party that intends to request for an adjustment to a *Unit Price* shall give timely *Notice in Writing* to the other party and to the *Consultant*.
- 6.7.6 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.
- 6.7.7 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION.

PART 7 DEFAULT NOTICE

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

- 7.1.1 If the *Contractor* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Contractor's* insolvency, or if a receiver is appointed because of the *Contractor's* insolvency, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, terminate the *Contractor's* right to continue with the *Work*, by giving the *Contractor* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.
- 7.1.2 If the *Contractor* neglects to prosecute the *Work* properly or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and if the *Consultant* has given a written statement to the *Owner* and *Contractor* that sufficient cause exists to justify such action, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor Notice in Writing* that the *Contractor* is in default of the *Contractor's* contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.
- 7.1.3 If the default cannot be corrected in the 5 *Working Days* specified or in such other time period as may be subsequently agreed in writing by the parties, the *Contractor* shall be in compliance with the *Owner's* instructions if the *Contractor*:
- .1 commences the correction of the default within the specified time, and
 - .2 provides the *Owner* with an acceptable schedule for such correction, and
 - .3 corrects the default in accordance with the *Contract* terms and with such schedule.
- 7.1.4 If the *Contractor* fails to correct the default in the time specified or in such other time period as may be subsequently agreed in writing by the parties, without prejudice to any other right or remedy the *Owner* may have, the *Owner* may:
- .1 correct such default and deduct the cost thereof from any payment then or thereafter due the *Contractor* provided the *Consultant* has certified such cost to the *Owner* and the *Contractor*, or
 - .2 terminate the *Contractor's* right to continue with the *Work* in whole or in part or terminate the *Contract*.

- 7.1.5 If the *Owner* terminates the *Contractor's* right to continue with the *Work* as provided in paragraphs 7.1.1 and 7.1.4, the *Owner* shall be entitled to:
- .1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* at the *Place of the Work*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense, and
 - .2 withhold further payment to the *Contractor* until a final certificate for payment is issued, and
 - .3 charge the *Contractor* the amount by which the full cost of finishing the *Work* as certified by the *Consultant*, including compensation to the *Consultant* for the *Consultant's* additional services and a reasonable allowance as determined by the *Consultant* to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 - WARRANTY, exceeds the unpaid balance of the *Contract Price*; however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference, and
 - .4 on expiry of the warranty period, charge the *Contractor* the amount by which the cost of corrections to the *Contractor's* work under GC 12.3 - WARRANTY exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the *Contractor* the difference.
- 7.1.6 The *Contractor's* obligation under the *Contract* as to quality, correction and warranty of the work performed by the *Contractor* up to the time of termination shall continue after such termination of the *Contract*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

- 7.2.1 If the *Owner* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Owner's* insolvency, or if a receiver is appointed because of the *Owner's* insolvency, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.
- 7.2.2 If the *Work* should be suspended or otherwise delayed for a period of 20 *Working Days* or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or of anyone directly or indirectly employed or engaged by the *Contractor*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* *Notice in Writing* to that effect.
- 7.2.3 The *Contractor* may give *Notice in Writing* to the *Owner*, with a copy to the *Consultant*, that the *Owner* is in default of the *Owner's* contractual obligations if:
- .1 the *Owner* fails to furnish, when so requested by the *Contractor*, reasonable evidence that financial arrangements have been made to fulfill the *Owner's* obligations under the *Contract*, or
 - .2 the *Consultant* fails to issue a certificate as provided in GC 5.3 - PROGRESS PAYMENT, or
 - .3 the *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by arbitration or court, or
 - .4 the *Owner* violates the requirements of the *Contract* to a substantial degree and the *Consultant*, except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER, confirms by written statement to the *Contractor* that sufficient cause exists.
- 7.2.4 The *Contractor's* *Notice in Writing* to the *Owner* provided under paragraph 7.2.3 shall advise that if the default is not corrected within 5 *Working Days* following the receipt of the *Notice in Writing*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, suspend the *Work* or terminate the *Contract*.
- 7.2.5 If the *Contractor* terminates the *Contract* under the conditions set out above, the *Contractor* shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*.

PART 8 DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

- 8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of the *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved in the first instance by findings of the *Consultant* as provided in GC 2.2 - ROLE OF THE CONSULTANT, shall be settled in accordance with the requirements of Part 8 of the General Conditions - DISPUTE RESOLUTION.
- 8.1.2 If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, the procedures set out in paragraph 8.1.3 and paragraphs 8.2.3 to 8.2.8 of GC 8.2 - NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.3 - RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.

- 8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instructions as in the *Consultant's* opinion are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim the party may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required, including costs resulting from interruption of the *Work*.

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

- 8.2.1 In accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, the parties shall appoint a Project Mediator
- .1 within 20 *Working Days* after the *Contract* was awarded, or
 - .2 if the parties neglected to make an appointment within the 20 *Working Days*, within 10 *Working Days* after either party by *Notice in Writing* requests that the Project Mediator be appointed.
- 8.2.2 A party shall be conclusively deemed to have accepted a finding of the *Consultant* under GC 2.2 - ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*. The responding party shall send a *Notice in Writing* of reply to the dispute within 10 *Working Days* after receipt of such *Notice in Writing* setting out particulars of this response and any relevant provisions of the *Contract Documents*.
- 8.2.3 The parties shall make all reasonable efforts to resolve their dispute by amicable negotiations and agree to provide, without prejudice, frank, candid and timely disclosure of relevant facts, information and documents to facilitate these negotiations.
- 8.2.4 After a period of 10 *Working Days* following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.2.2, the parties shall request the Project Mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing.
- 8.2.5 If the dispute has not been resolved within 10 *Working Days* after the Project Mediator was requested under paragraph 8.2.4 or within such further period agreed by the parties, the Project Mediator shall terminate the mediated negotiations by giving *Notice in Writing* to the *Owner*, the *Contractor* and the *Consultant*.
- 8.2.6 By giving a *Notice in Writing* to the other party and the *Consultant*, not later than 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.2.5, either party may refer the dispute to be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing. The arbitration shall be conducted in the jurisdiction of the *Place of the Work*.
- 8.2.7 On expiration of the 10 *Working Days*, the arbitration agreement under paragraph 8.2.6 is not binding on the parties and, if a *Notice in Writing* is not given under paragraph 8.2.6 within the required time, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.
- 8.2.8 If neither party, by *Notice in Writing*, given within 10 *Working Days* of the date of *Notice in Writing* requesting arbitration in paragraph 8.2.6, requires that a dispute be arbitrated immediately, all disputes referred to arbitration as provided in paragraph 8.2.6 shall be
- .1 held in abeyance until
 - (1) *Substantial Performance of the Work*,
 - (2) the *Contract* has been terminated, or
 - (3) the *Contractor* has abandoned the *Work*,whichever is earlier; and
 - .2 consolidated into a single arbitration under the rules governing the arbitration under paragraph 8.2.6.

GC 8.3 RETENTION OF RIGHTS

- 8.3.1 It is agreed that no act by either party shall be construed as a renunciation or waiver of any rights or recourses, provided the party has given the *Notice in Writing* required under Part 8 of the General Conditions - DISPUTE RESOLUTION and has carried out the instructions as provided in paragraph 8.1.3 of GC 8.1 – AUTHORITY OF THE CONSULTANT.

- 8.3.2 Nothing in Part 8 of the General Conditions - DISPUTE RESOLUTION shall be construed in any way to limit a party from asserting any statutory right to a lien under applicable lien legislation of the jurisdiction of the *Place of the Work* and the assertion of such right by initiating judicial proceedings is not to be construed as a waiver of any right that party may have under paragraph 8.2.6 of GC 8.2 – NEGOTIATION, MEDIATION AND ARBITRATION to proceed by way of arbitration to adjudicate the merits of the claim upon which such a lien is based.

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

- 9.1.1 The *Contractor* shall protect the *Work* and the *Owner's* property and property adjacent to the *Place of the Work* from damage which may arise as the result of the *Contractor's* operations under the *Contract*, and shall be responsible for such damage, except damage which occurs as the result of:
- .1 errors in the *Contract Documents*;
 - .2 acts or omissions by the *Owner*, the *Consultant*, other contractors, their agents and employees.
- 9.1.2 Before commencing any work, the *Contractor* shall determine the location of all underground utilities and structures indicated in the *Contract Documents* or that are reasonably apparent in an inspection of the *Place of the Work*.
- 9.1.3 Should the *Contractor* in the performance of the *Contract* damage the *Work*, the *Owner's* property, or property adjacent to the *Place of the Work*, the *Contractor* shall be responsible for making good such damage at the *Contractor's* expense.
- 9.1.4 Should damage occur to the *Work* or *Owner's* property for which the *Contractor* is not responsible, as provided in paragraph 9.1.1, the *Contractor* shall make good such damage to the *Work* and, if the *Owner* so directs, to the *Owner's* property. The *Contract Price* and *Contract Time* shall be adjusted as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

- 9.2.1 For the purposes of applicable legislation related to toxic and hazardous substances, the *Owner* shall be deemed to have control and management of the *Place of the Work* with respect to existing conditions.
- 9.2.2 Prior to the *Contractor* commencing the *Work*, the *Owner* shall,
- .1 take all reasonable steps to determine whether any toxic or hazardous substances are present at the *Place of the Work*, and
 - .2 provide the *Consultant* and the *Contractor* with a written list of any such substances that are known to exist and their locations.
- 9.2.3 The *Owner* shall take all reasonable steps to ensure that no person's exposure to any toxic or hazardous substances exceeds the time weighted levels prescribed by applicable legislation at the *Place of the Work* and that no property is damaged or destroyed as a result of exposure to, or the presence of, toxic or hazardous substances which were at the *Place of the Work* prior to the *Contractor* commencing the *Work*.
- 9.2.4 Unless the *Contract* expressly provides otherwise, the *Owner* shall be responsible for taking all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to dispose of, store or otherwise render harmless toxic or hazardous substances which were present at the *Place of the Work* prior to the *Contractor* commencing the *Work*.
- 9.2.5 If the *Contractor*
- .1 encounters toxic or hazardous substances at the *Place of the Work*, or
 - .2 has reasonable grounds to believe that toxic or hazardous substances are present at the *Place of the Work*, which were not brought to the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible and which were not disclosed by the *Owner* or which were disclosed but have not been dealt with as required under paragraph 9.2.4, the *Contractor* shall
 - .3 take all reasonable steps, including stopping the *Work*, to ensure that no person's exposure to any toxic or hazardous substances exceeds any applicable time weighted levels prescribed by applicable legislation at the *Place of the Work*, and
 - .4 immediately report the circumstances to the *Consultant* and the *Owner* in writing.
- 9.2.6 If the *Owner* and *Contractor* do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

- 9.2.7 If the *Owner* and *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were not brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall promptly at the *Owner's* own expense:
- .1 take all steps as required under paragraph 9.2.4;
 - .2 reimburse the *Contractor* for the costs of all steps taken pursuant to paragraph 9.2.5;
 - .3 extend the *Contract* time for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in 9.2.6 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay; and
 - .4 indemnify the *Contractor* as required by GC 12.1 - INDEMNIFICATION.
- 9.2.8 If the *Owner* and *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Contractor* shall promptly at the *Contractor's* own expense:
- .1 take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose the toxic or hazardous substances;
 - .2 make good any damage to the *Work*, the *Owner's* property or property adjacent to the place of the *Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY;
 - .3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.2.6; and
 - .4 indemnify the *Owner* as required by GC 12.1 - INDEMNIFICATION.
- 9.2.9 If either party does not accept the expert's findings under paragraph 9.2.6, the disagreement shall be settled in accordance with Part 8 of the General Conditions - Dispute Resolution. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraph 9.2.7 or 9.2.8 it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided by GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

GC 9.3 ARTIFACTS AND FOSSILS

- 9.3.1 Fossils, coins, articles of value or antiquity, structures and other remains or things of scientific or historic interest discovered at the *Place or Work* shall, as between the *Owner* and the *Contractor*, be deemed to be the absolute property of the *Owner*.
- 9.3.2 The *Contractor* shall take all reasonable precautions to prevent removal or damage to discoveries as identified in paragraph 9.3.1, and shall advise the *Consultant* upon discovery of such items.
- 9.3.3 The *Consultant* will investigate the impact on the *Work* of the discoveries identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Consultant*, with the *Owner's* approval, will issue appropriate instructions for a change in the *Work* as provided in GC 6.2 - CHANGE ORDER or GC 6.3 CHANGE DIRECTIVE.

GC 9.4 CONSTRUCTION SAFETY

- 9.4.1 Subject to paragraph 3.2.2.2 of GC 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, the *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*.

GC 9.5 MOULD

- 9.5.1 If the *Contractor* or *Owner* observes or reasonably suspects the presence of mould at the *Place of the Work*, the remediation of which is not expressly part of the *Work*,
- .1 the observing party shall promptly report the circumstances to the other party in writing, and
 - .2 the *Contractor* shall promptly take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould, and
 - .3 if the *Owner* and *Contractor* do not agree on the existence, significance or cause of the mould or as to what steps need be taken to deal with it, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and *Contractor*.
- 9.5.2 If the *Owner* and *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was caused by the *Contractor's* operations under the *Contract*, the *Contractor* shall promptly, at the *Contractor's* own expense:
- .1 take all reasonable and necessary steps to safely remediate or dispose of the mould, and
 - .2 make good any damage to the *Work*, the *Owner's* property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 - PROTECTION OF WORK AND PROPERTY, and
 - .3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.5.1.3, and
 - .4 indemnify the *Owner* as required by paragraph 12.1 of GC 21.1 - INDEMNIFICATION.

- 9.5.3 If the *Owner* and *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was not caused by the *Contractor*'s operations under the *Contract*, the *Owner* shall promptly, at the *Owner*'s own expense:
- .1 take all reasonable and necessary steps to safely remediate or dispose of the mould, and
 - .2 reimburse the *Contractor* for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the *Work* as provided in paragraph 9.1.4 of GC 9.1 - PROTECTION OF WORK AND PROPERTY, and
 - .3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in paragraph 9.5.1.3 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay, and
 - .4 indemnify the *Contractor* as required by paragraph 12.1.
- 9.5.4 If either party does not accept the expert's finding under paragraph 9.5.1.3, the disagreement shall be settled in accordance with Part 8 of the General Conditions - DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraphs 9.5.2 or 9.5.3, it being understood that by so doing neither party will jeopardize any claim the party may have.

PART 10 GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

- 10.1.1 The *Contract Price* shall include all taxes and customs duties in effect at the time of the bid closing except for *Value Added Taxes* payable by the *Owner* to the *Contractor* as stipulated in Article A-4 of the Agreement - CONTRACT PRICE.
- 10.1.2 Any increase or decrease in costs to the *Contractor* due to changes in such included taxes and duties after the time of the bid closing shall increase or decrease the *Contract Price* accordingly.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

- 10.2.1 The laws of the *Place of the Work* shall govern the *Work*.
- 10.2.2 The *Owner* shall obtain and pay for development approvals, building permit, permanent easements, rights of servitude, and all other necessary approvals and permits, except for the permits and fees referred to in paragraph 10.2.3 or for which the *Contract Documents* specify as the responsibility of the *Contractor*.
- 10.2.3 The *Contractor* shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the *Work* and customarily obtained by contractors in the jurisdiction of the *Place of the Work* after the issuance of the building permit. The *Contract Price* includes the cost of these permits, licences, inspections, and certificates, and their procurement.
- 10.2.4 The *Contractor* shall give the required notices and comply with the laws, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.
- 10.2.5 The *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the *Work*. If the *Contract Documents* are at variance therewith, or if, subsequent to the time of bid closing, changes are made to the applicable laws, ordinances, rules, regulations, or codes which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will make the changes required to the *Contract Documents* as provided in GC 6.1 - OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.
- 10.2.6 If the *Contractor* fails to advise the *Consultant* in writing; and fails to obtain direction as required in paragraph 10.2.5; and performs work knowing it to be contrary to any laws, ordinances, rules, regulations, or codes; the *Contractor* shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations, or codes.
- 10.2.7 If, subsequent to the time of bid closing, changes are made to applicable laws, ordinances, rules, regulations, or codes of authorities having jurisdiction which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

GC 10.3 PATENT FEES

- 10.3.1 The *Contractor* shall pay the royalties and patent licence fees required for the performance of the *Contract*. The *Contractor* shall hold the *Owner* harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor's* performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention by the *Contractor* or anyone for whose acts the *Contractor* may be liable.
- 10.3.2 The *Owner* shall hold the *Contractor* harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor's* performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the *Contract*, the model, plan or design of which was supplied to the *Contractor* as part of the *Contract Documents*.

GC 10.4 WORKERS' COMPENSATION

- 10.4.1 Prior to commencing the *Work*, *Substantial Performance of the Work* and the issuance of the final certificate for payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation at the *Place of the Work*, including payments due thereunder.
- 10.4.2 At any time during the term of the *Contract*, when requested by the *Owner*, the *Contractor* shall provide such evidence of compliance by the *Contractor* and *Subcontractors*.

PART 11 INSURANCE AND CONTRACT SECURITY

GC 11.1 INSURANCE

- 11.1.1 Without restricting the generality of GC 12.1 - INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the minimum requirements of which are specified in CCDC 41 – CCDC Insurance Requirements in effect at the time of bid closing except as hereinafter provided:
- .1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Substantial Performance of the Work*. Liability coverage shall be provided for completed operations hazards from the date of *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work*, on an ongoing basis for a period of 6 years following *Substantial Performance of the Work*.
 - .2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Substantial Performance of the Work*.
 - .3 Aircraft or Watercraft Liability Insurance when owned or non-owned aircraft or watercraft are used directly or indirectly in the performance of the *Work*
 - .4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as Insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:
 - (1) 10 calendar days after the date of *Substantial Performance of the Work*;
 - (2) on the commencement of use or occupancy of any part or section of *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*;
 - (3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.
 - .5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as Insureds all *Subcontractors*. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Substantial Performance of the Work*.
 - .6 The "Broad form" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:
 - (1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

- (2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner's* interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor's* interest in the restoration of the *Work*; and
- (3) to the *Work* arising from the work of the *Owner*, the *Owner's* own forces, or another contractor, in accordance with the *Owner's* obligations under the provisions relating to construction by *Owner* or other contractors, shall pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Substantial Performance of the Work*.

- 11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.
- 11.1.3 The parties shall pay their share of the deductible amounts in direct proportion to their responsibility in regards to any loss for which the above policies are required to pay, except where such amounts may be excluded by the terms of the *Contract*.
- 11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right to provide and maintain such insurance and give evidence to the *Contractor* and the *Consultant*. The *Contractor* shall pay the cost thereof to the *Owner* on demand or the *Owner* may deduct the cost from the amount which is due or may become due to the *Contractor*.
- 11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.
- 11.1.6 If a revised version of CCDC 41 – INSURANCE REQUIREMENTS is published, which specifies reduced insurance requirements, the parties shall address such reduction, prior to the *Contractor's* insurance policy becoming due for renewal, and record any agreement in a *Change Order*.
- 11.1.7 If a revised version of CCDC 41 – INSURANCE REQUIREMENTS is published, which specifies increased insurance requirements, the *Owner* may request the increased coverage from the *Contractor* by way of a *Change Order*.
- 11.1.8 A *Change Directive* shall not be used to direct a change in the insurance requirements in response to the revision of CCDC 41 – INSURANCE REQUIREMENTS.

GC 11.2 CONTRACT SECURITY

- 11.2.1 The *Contractor* shall, prior to commencement of the *Work* or within the specified time, provide to the *Owner* any *Contract* security specified in the *Contract Documents*.
- 11.2.2 If the *Contract Documents* require surety bonds to be provided, such bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*. The form of such bonds shall be in accordance with the latest edition of the CCDC approved bond forms.

PART 12 INDEMNIFICATION, WAIVER OF CLAIMS AND WARRANTY

GC 12.1 INDEMNIFICATION

- 12.1.1 Without restricting the *Owner's* obligation to indemnify as described in paragraphs 12.1.4 and 12.1.5, the *Owner* and the *Contractor* shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this *Contract*, provided such claims are:
 - .1 caused by:
 - (1) the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose acts or omissions that party is liable, or
 - (2) a failure of the party to the *Contract* from whom indemnification is sought to fulfill its terms or conditions; and

- 2 made by *Notice in Writing* within a period of 6 years from the date of *Substantial Performance of the Work* as set out in the certificate of *Substantial Performance of the Work* issued pursuant to paragraph 5.4.2.2 of GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK or within such shorter period as may be prescribed by any limitation statute of the province or territory of the *Place of the Work*.

The parties expressly waive the right to indemnity for claims other than those provided for in this *Contract*.

- 12.1.2 The obligation of either party to indemnify as set forth in paragraph 12.1.1 shall be limited as follows:
 - 1 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is to be provided by either party pursuant to GC 11.1 – INSURANCE, the general liability insurance limit for one occurrence as referred to in CCDC 41 in effect at the time of bid closing.
 - 2 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is not required to be provided by either party in accordance with GC 11.1 – INSURANCE, the greater of the *Contract Price* as recorded in Article A-4 – CONTRACT PRICE or \$2,000,000, but in no event shall the sum be greater than \$20,000,000.
 - 3 In respect to claims by third parties for direct loss resulting from bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, the obligation to indemnify is without limit. In respect to all other claims for indemnity as a result of claims advanced by third parties, the limits of indemnity set forth in paragraphs 12.1.2.1 and 12.1.2.2 shall apply.
- 12.1.3 The obligation of either party to indemnify the other as set forth in paragraphs 12.1.1 and 12.1.2 shall be inclusive of interest and all legal costs.
- 12.1.4 The *Owner* and the *Contractor* shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.
- 12.1.5 The *Owner* shall indemnify and hold harmless the *Contractor* from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings:
 - 1 as described in paragraph 10.3.2 of GC 10.3 – PATENT FEES, and
 - 2 arising out of the *Contractor's* performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.
- 12.1.6 In respect to any claim for indemnity or to be held harmless by the *Owner* or the *Contractor*:
 - 1 *Notice in Writing* of such claim shall be given within a reasonable time after the facts upon which such claim is based became known;
 - 2 should any party be required as a result of its obligation to indemnify another to pay or satisfy a final order, judgment or award made against the party entitled by this contract to be indemnified, then the indemnifying party upon assuming all liability for any costs that might result shall have the right to appeal in the name of the party against whom such final order or judgment has been made until such rights of appeal have been exhausted.

GC 12.2 WAIVER OF CLAIMS

- 12.2.1 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* arising from the *Contractor's* involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:
 - 1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;
 - 2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;
 - 3 claims for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 12.1.4 or 12.1.5 of GC 12.1 – INDEMNIFICATION; and
 - 4 claims resulting from acts or omissions which occur after the date of *Substantial Performance of the Work*.
- 12.2.2 The *Contractor* waives and releases the *Owner* from all claims referenced in paragraph 12.2.1.4 except for those referred in paragraphs 12.2.1.2 and 12.2.1.3 of GC 12.1 – INDEMNIFICATION and claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the date of *Substantial Performance of the Work*.

- 12.2.3 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* arising from the *Owner's* involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:
- .1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;
 - .2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;
 - .3 claims for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 12.1.4 of GC 12.1 - INDEMNIFICATION;
 - .4 damages arising from the *Contractor's* actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;
 - .5 claims arising pursuant to GC 12.3 - WARRANTY; and
 - .6 claims arising from acts or omissions which occur after the date of *Substantial Performance of the Work*.
- 12.2.4 The *Owner* waives and releases the *Contractor* from all claims referred to in paragraph 12.2.3.4 except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the date of *Substantial Performance of the Work* should any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, within such shorter period as may be prescribed by:
- .1 any limitation statute of the Province or Territory of the *Place of the Work*; or
 - .2 if the *Place of the Work* is the Province of Quebec, then Article 2118 of the Civil Code of Quebec.
- 12.2.5 The *Owner* waives and releases the *Contractor* from all claims referenced in paragraph 12.2.3.6 except for those referred in paragraph 12.2.3.2, 12.2.3.3 and those arising under GC 12.3 – WARRANTY and claims for which *Notice in Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the date of *Substantial Performance of the Work*.
- 12.2.6 "Notice in Writing of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 12.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:
- .1 a clear and unequivocal statement of the intention to claim;
 - .2 a statement as to the nature of the claim and the grounds upon which the claim is based; and
 - .3 a statement of the estimated quantum of the claim.
- 12.2.7 The party giving "Notice in Writing of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.
- 12.2.8 Where the event or series of events giving rise to a claim made under paragraphs 12.2.1 or 12.2.3 has a continuing effect, the detailed account submitted under paragraph 12.2.7 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.
- 12.2.9 If a *Notice in Writing* of claim pursuant to paragraph 12.2.1.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph 12.2.3.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*. If a *Notice in Writing* of claim pursuant to paragraph 12.2.3.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph 12.2.1.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*.

GC 12.3 WARRANTY

- 12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date of *Substantial Performance of the Work*.
- 12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

- 12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.
- 12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor's* expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.
- 12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.
- 12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor's* responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

