REGIONAL DISTRICT
of Fraser-Fort George

INVITATION TO TENDER
ES-20-16

2020 Landfill Gas Well Field Expansion Construction Project
Foothills Boulevard Regional Landfill

Date Issued:	July 14, 2020
Closing Location:	Regional District Office 3rd Floor, 155 George Street, Prince George, BC V2L 1P8
Mandatory Site Meeting:	Tuesday, July 21, 2020 1:00 pm (Pacific Standard Time) Foothills Boulevard Regional Landfill
Closing Date and Time:	**Tuesday, August 4, 2020** **2:00 pm (Pacific Standard Time)** **No Public Opening**
General Inquiries:	Email Darwin Paton at dpaton@rdffg.bc.ca
Technical Inquiries:	Email Rana Mandour at rana.mandour@tetratech.com
Note:	Late submissions will not be considered

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1.0 INVITATION AND INSTRUCTIONS

The Regional District of Fraser Fort George is inviting tenders from qualified contractors for the 2020 Landfill Gas Well Field Expansion Construction Project at the Foothills Boulevard Regional Landfill.

This project includes the following elements:

1. Construction of 16 new vertical Landfill Gas (LFG) extraction wells.
2. Construction of well field pipework (sub-headers and laterals) to tie in new LFG wells to existing wells to existing system.
3. New construction of isolation valves and sample ports.

The purpose of the project is to undertake the 2020 Landfill Gas Well Field Expansion Construction Project as per the Interim Phase 1 Landfill Gas Management Plan, issued November 2008 and the Short-Term Fill Plan Update, May 2016, for the Foothills Boulevard Regional Landfill, based upon the drawings and specifications included in the Invitation to Tender.

1.1 Tender Documents

A complete set of construction drawings for the entire project is included with the tender package and will be available in the following formats on, or after, Tuesday, July 14, 2020 as follows:

a) in a PDF (public document format) file format from the Regional District's website at www.rdffg.bc.ca;

b) on the BC Bid® website at www.bcbid.gov.bc.ca;

c) in hard copy from the Regional District Service Centre, 155 George Street, Prince George, BC **by appointment only,** between 8:00 a.m. and 5:00 p.m., Monday to Friday, excluding statutory holidays. The cost for each hard copy tender package is twenty-five dollars ($25) (GST included) and is non-refundable.

All subsequent information regarding this Invitation to Tender (ITT), including amendments, addenda and answers to questions will also be available as above.

It is the sole responsibility of the Tenderer to ascertain that they have received a full set of the ITT documents. Upon submission of their tender document, the Tenderer will be deemed conclusively to have been in possession of a full set of the ITT documents.

Inquiries relating to this ITT must be made in writing by email to:

General Inquiries:

Darwin Paton
Environmental Services Technician
Regional District of Fraser-Fort George
155 George Street
Prince George, BC V2L 1P8
Phone: (250) 960-4400
Email: dpaton@rdffg.bc.ca

Technical Inquiries:

Rana Mandour, E.I.T
Project Engineer-in-Training
Tetra Tech Canada Inc.
14940 – 123rd Avenue
Edmonton AB T5V 1B4
Phone: (587) 597-0484
Email: rana.mandour@tetratech.com

1.2 Mandatory Site Visit

The Project Manager or delegate will provide an overview of the contract expectations and be available for general questions pertaining to this ITT. The purpose of this meeting is for the Tenderer to satisfy themselves as to the nature of the work, in general, to clarify their understanding of the scope of work, determine dimensions and to have clarified any questions regarding the

attached Drawings and Specifications forming part of this Tender, and any other circumstances which may influence their Tender submission.

The Regional District will not, under any circumstances, make accommodations for rescheduling, or holding any additional site visits or providing individuals access to the sites.

The mandatory site visit will be held for all prospective Tenderers. The meeting is scheduled for 1:00 p.m. on Tuesday, July 21, 2020 at the Foothills Boulevard Regional Landfill, 6595 Foothills Boulevard, Prince George, BC.

Tender submissions received from any Tenderer who did not attend the mandatory site meeting will be rejected.

NOTE: DUE TO THE CURRENT PANDEMIC THE REGIONAL DISTRICT IS ENFORCING THE FOLLOWING PROTOCOLS IN RELATION TO SITE MEETINGS:

a) Only one representative per Company allowed on site
b) 2 meter social distancing must be maintained at all times
c) Hands must be sanitized upon arrival, (provided)
d) Face Masks are optional
e) All attendees must fill out a Covid19 Risk Assessment Form
f) Any Company Representative not following the above requirements will be asked to leave

1.3 Tender Submissions and Closing Date

The Regional District will accept tenders submitted by direct delivery to the Regional District main office. All tenders must be submitted to the Regional District's General Manager of Financial Services by 2:00 p.m. (local time) on Tuesday, August 4, 2020.

Three (3) complete copies of the Tender must be submitted in a sealed envelope with the following information written on the outside of the envelope containing the tender, as well as on the outside of the courier envelope/box (if sending by courier):

1. Attention: General Manager of Financial Services
   Regional District of Fraser-Fort George
   3rd Floor, 155 George Street
   Prince George, BC V2L 1P8

2. Invitation to Tender, ES-20-16
   2020 Landfill Gas Well Field Expansion
   Construction Project - Foothills Boulevard Regional Landfill

3. Responding Tenderer's name and address.

To be considered, tenders must be signed by an authorized signatory of the tenderer. By signing the tender, the tenderer is bound to statements made in response to this ITT. Any tender received by the Regional District that is unsigned will be rejected.

Tenders submitted by fax electronically or not in original Regional District format will **NOT** be accepted. Any tender received after the closing date and time will be considered disqualified and will be returned to the Tenderer.

Tenders not submitted in strict accordance with these instructions or not complying with the requirements in this ITT may be rejected.

The Regional District will not be responsible for any costs incurred by tenderers as a result of the preparation or submission of a tender pertaining to this ITT. The accuracy and completeness of the tender is the tenderer's responsibility. Should errors in a tender be discovered, the tenderer shall be solely responsible for any additional costs incurred by that tenderer in the performance of the work and shall be solely responsible to correct any deficiencies or errors in that tender at their expense.

1.4 Acknowledgement Letter

Upon receipt of this ITT, a potential tenderer is requested to complete and sign the Acknowledgement Letter and mail or email the signed Acknowledgement Letter to Darwin Paton, at dpaton@rdffg.bc.ca.

A tenderer who signs and returns the Acknowledgement Letter is not obligated to submit a tender.

Any tenderer who does not submit the Acknowledgement Letter will not be sent any amendments, addenda, or answers to questions and their tender may be disqualified if it is incomplete or non-compliant as a result of the tenderer's failure to acknowledge receipt of an addendum in accordance with this ITT, or as a result of the tenderer's failure to comply with the requirements of an amendment or addendum to this ITT.

1.5 Regional District's Right to Reject Tender

The Regional District reserves the right, in its sole discretion, to waive informalities in tenders, reject any and all tenders, or accept the tender deemed most favourable in the interests of the Regional District. The lowest, or any tender, will not necessarily be awarded.

Tenders which contain qualifying conditions or otherwise fail to conform to the instructions contained in this ITT may be disqualified or rejected. The Regional District may, however, in its sole discretion, reject or retain for its consideration tenders which are non-conforming because they do not contain the content or form required by the ITT, or for failure to comply with the process for submission set out in this ITT, whether or not such non-compliance is material.

The Regional District reserves the right to reject a tender based on potential or perceived conflict of interest on the part of a tenderer. Without limitation, the Regional District reserves the discretion to reject any tender where:

a) one or more of the directors, officers, principals, partners, senior management employees, shareholders or owners of the tenderer, is an officer, employee or director of the Regional District, or is a member of the immediate family of an officer, employee or director of the Regional District; or

b) in the case of a tender submitted by a tenderer who is an individual person, where that individual is an officer, employee or director of the Regional District, or is a member of the immediate family of an officer, employee or director of the Regional District.

When submitting a tender, the respondent is required to complete, sign, and include with their proposal a Conflict of Interest Disclosure Statement (page 31).

The Regional District reserves the right to reject any tender submitted by a tenderer who is, or whose principals are, at the time of tendering, engaged in a lawsuit against the Regional District in relation to work similar to that being tendered.

1.6 Waiver of Claims for Compensation

Except for a claim for the reasonable cost of preparation of its tender, by submitting a tender, each tenderer irrevocably waives any claim, action, or proceeding against the Regional District including, without limitation, any judicial review or injunction application, and any claim against the Regional District and its elected officials, officers and employees for damages, expenses or costs, loss of profits, loss of opportunity or any consequential loss for any reason, including any such claim, action or proceeding arising from:

1) any actual or alleged unfairness on the part of the Regional District at any stage of the tender process, including without limitation any alleged unfairness in the evaluation of a tender or award of a contract;

2) a decision by the Regional District not to award a contract to that tenderer; or

3) the Regional District's award of a contract to a tenderer whose tender does not conform to the requirements of this ITT.

1.7 Proof of Ability

Tenderers must be competent and capable of performing the work as described in the Scope of Work and Specifications. The tenderer is required to provide evidence of previous experience and financial responsibility before a contract is awarded.

A complete list of Sub-Contractors, which the Tenderer will make available for the completion of the contract, will be included with each Tender.

1.8 Sub-Contractors

The List of Sub-Contractors is to be completed by the tenderer and will form part of the contract documents. The sub-contractors named in the List of Sub-Contractors will not be changed nor will additional sub-contractors be employed except with the written approval of the Regional District.

The Contractor is responsible to the Regional District for the acts and omissions of their sub-contractors to the same extent that they are responsible for the acts and omissions of persons employed by them. Nothing in the contract documents will create any contractual relation between any sub-contractor and the Regional District. The Contractor will bind every sub-contractor to the terms of the contract documents.

1.9 Discrepancies or Omissions

Tenderers finding discrepancies, errors, or omissions in this ITT, or requiring clarification on the meaning or intent of any part therein, should immediately request in written form by email to Darwin Paton, dpaton@rdffg.bc.ca. Upon receipt of the written request for clarification, the Project Manager will send written instructions or explanations to all parties registered as having returned the Acknowledgement Letter. The Regional District will not accept responsibility for any damages, costs or expenses incurred by a tenderer in reliance on oral instructions. Any work done in preparation of a tender after discovery of discrepancies, errors or omissions in the ITT will be done at the tenderer's risk unless the discrepancy, error or omission is reported to the Project Manager in accordance with this provision.

NOTE: the last day that requests for clarification or inquiries may be made is Monday, July 27, 2020 at 3pm in order that addenda, if necessary, are issued in time for all tenderers to complete their submission and have it delivered to the Regional District office prior to the

closing time and date of the ITT. After July 27, 2020, should changes be necessary to the work of this ITT, they will be addressed through Article 11.0, Changes to the Contract Work.

1.10 Examination of Contract Documents and Site

The Contractor will satisfy themselves as to the practicability of executing the work in accordance with the Contract, and they will be held to have satisfied themselves in every particular before making up their Tender by inquiry, measurement, calculation and inspection of the site.

The Contractor will examine the site and its surroundings and, before submitting their Tender will satisfy themselves as to the nature of the site, the quantities and nature of the work and equipment necessary for the completion of the work, and the means of access to the site, the accommodation they may require, and in general, will obtain all relevant information as to risks, contingencies and other circumstances which may influence their Tender.

The Contractor will be deemed to have satisfied themselves as to the sufficiency of the Tender for the work and the prices stated in the Schedule of Prices. These prices will cover all their obligations under the Contract, and all matters necessary to the proper completion and maintenance of the work, and will include the Supply of all labour, equipment, material, supervision, services, taxes and assessments, together with the Contractor's overhead and profit, except where otherwise provided elsewhere in this Contract.

1.11 Site Location and Facility Information

The Site is located in the northwest portion of the City of Prince George, British Columbia at 6595 Foothills Boulevard, northwest of the intersection with West Austin Road as shown on the Drawings included in Appendix B.

2.0 TENDER FORMAT

Tenderers are asked to respond in the manner outlined below and submit **three (3) complete copies** of their tender. The following format and sequence, with all pages consecutively numbered, is to be followed in order to provide consistency in tenders and to ensure each tender receives full and complete consideration.

a. Tenderers will complete pages 22 through 31:

- Tender Form: to be completed, signed, and witnessed
- Tender Form Summary
- Schedule of Prices: the Schedule of Prices must be completed and included in the tender submission. All prices for the work shall be stated in Canadian dollars. Taxes are to be shown as separate line items on the Schedule of Prices. Any applicable Federal or Provincial taxes, or levies, must be included in the Total Contract Price
- Schedule of Additional Unit Prices
- Preliminary Construction Schedule
- Experience of Superintendent
- List of Sub-Contractors: to include sub-contractor's legal name and the work to be performed by the sub-contractor
- Tenderer’s Experience in Similar Work: a minimum of three references required, to include a brief description of projects similar in size and scope to this Invitation to Tender, along with the corresponding contact names and phone numbers for reference checks.

- Goods and Services Tax Information
- Conflict of Interest Disclosure Statement

b. A start to completion work plan: to include start of construction and completion dates and milestone dates for completion for the major components of this project. The proposed work plan needs to include consideration for alternative project tasks to help maintain project schedule should delays occur.

c. Additional information that the tenderer may choose to provide.

d. All amendments and addenda, if any, issued for this ITT. Each amendment and addendum must be signed by the tenderer and included with the tender and will form part of the tender and contract documents.

3.0 TENDER EVALUATION

Evaluation of tenders will be by a committee formed by the Regional District in order to provide a recommended award of contract (the "Contract"). Tenders should be clear, concise, and complete.

The following criteria will be used to evaluate the Tenders received.

Tender Evaluation Methodology

(a)	Proven, successful experience in providing similar works	30%
(b)	Acceptability of reference checks	10%
(c)	Preliminary Construction Schedule	10%
(d)	Price	50%
	TOTAL	100%

Price evaluation shall include the sum of the "Schedule of Prices" and "Schedule of Additional Unit Prices" as per the "Tender Form Summary". Quantities associated with the "Schedule of Additional Unit Prices" shall be used to calculate the total bid price in the "Tender Form Summary" only. The value of the contract will be the "Schedule of Prices" only.

The Contractor will have fourteen (14) calendar days to provide documentation verifying required Insurance coverage and WorkSafeBC coverage upon receiving notification that the Regional District has accepted its Tender.

Throughout the evaluation process, the Regional District, at its sole discretion, may request additional written clarification and/or supplemental information from selected tenderers as part of the evaluation process. Notwithstanding the results of the evaluation conducted by the committee, the Regional District reserves the right to select the tender that the Regional District considers provides best overall value.

4.0 CONTRACT

4.1 Form of Contract

The Contract Form and General Conditions which will be utilized will be CCDC 4-2011 Unit Price Contract.

4.2 Award of Contract

A contract for ES-20-16 2020 Landfill Gas Well Field Expansion - Construction Project - Foothills Boulevard Regional Landfill is anticipated to be awarded at Regional Board on August 20, 2020. All tenderers will be advised, in writing, as to the awarding of the Contract after that date.

The Regional District may, in its sole discretion, award Contract ES-20-16 2020 Landfill Gas Well Field Expansion - Construction Project - Foothills Boulevard Regional Landfill, or it may delay the date of awarding the Contract or cancel this ITT if deemed appropriate by the Regional District for any reason.

5.0 START AND DURATION OF CONTRACT

The term of the Contract will begin on September 1, 2020 at 12:01 a.m. and the Contract will remain in force until project completion. Construction will commence upon award and signing of the contract as laid out in Part 1 of the Tender.

A construction start date will be mutually agreed upon by the Regional District and the Contractor. Once construction works begin on-site, they will continue without interruption until project completion, on or before November 1, 2020 or later date as agreed upon by the Regional District and the Contractor.

In the event of an unanticipated work stoppage due to changes in the status of the current pandemic or delays in material delivery or inclement weather and in the absence of alternative contractual related tasks, no fault should be found with either the Owner or the Contractor and a revised schedule shall be agreed upon.

6.0 TERM AND TERMINATION

The term of this Contract shall commence as set out in Section 5.0 and shall continue in effect until terminated by either party as provided herein. Either party may terminate this Agreement at any time, with or without cause, by providing not less than thirty (30) business days advance written notice to the other party. The Contractor or the Regional District may terminate this Agreement immediately in writing if either party becomes insolvent, enters bankruptcy, receivership, or other like proceeding (voluntary or involuntary) or makes an assignment for the benefit of creditors.

7.0 INTENT OF CONTRACT DOCUMENTS

This Contract is not an agreement of employment. The Contractor is an independent contractor and nothing herein will be construed to create a partnership, joint venture, or agency and neither party will be responsible for the debts or obligations of the other.

8.0 ASSIGNMENT OF CONTRACT

The Contractor will not sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portions thereof, or their right, title or interest therein, or their obligations thereunder without written consent of the Regional District, except for an assignment to a bank of the payments to be received hereunder.

9.0 BID PRICES

Tender prices must remain open for acceptance for a period of sixty (60) days from the time of Tender opening (Tuesday, August 04, 2020), unless otherwise stated by the Regional District.

Tenders will be evaluated on the ability of the Tenderer to comply with Contract requirements, the Tendered Price and experience as stated in Section 3: TENDER EVALUATION. Where bid prices are the same, the Regional District will consider experience in similar work beyond the minimum standards established in the Contract.

The Regional District of Fraser-Fort George will not be responsible for any costs incurred by the respondent which may result from the preparation or submission of documents pertaining to this Tender.

10.0 PAYMENT

a. Payment will be made by the Regional District within thirty (30) days of the Engineer approving the invoice.

b. Each progress payment claim is subject to a 10% hold back. All claims must be accompanied by supporting documentation as to its completion and proof of passing all required inspections.

c. The Regional District and/or the Engineer will inspect the work before making recommendation of payment.

d. The Regional District will withhold 10% of the total payment due under the Contract as a performance assurance holdback. The holdback will be released to the Contractor once the following two conditions have been satisfied:

    1. The work has been completed to the satisfaction of the Regional District.

    2. The Regional District has received notification from WorkSafeBC that all required WorkSafeBC assessments have been paid for the period covering the Contract term.

e. No payment will be made for materials supplied by the Regional District.

11.0 BONDING

11.1 Bid Bond:

The bid must be accompanied by a Bid Bond in an amount of ten percent (10%) of the total tendered price.

The Bid Bond must be issued by a Surety Company licensed to conduct business in the Province of British Columbia wherein the work is located.

If the successful bidder fails, for any reason, to execute the Contract, the portion of this Bid Bond will be forfeited to, and retained by, the Regional District of Fraser Fort George, in the amount for which the Regional District may legally contract with another party to perform the work, if the latter amount be in excess of the former.

The Bid Bonds submitted by unsuccessful bidders will be returned to them, without interest, as soon as the successful bidder has delivered, to the Regional District, a fully executed Contract for the work, or the period for which bids are irrevocable has elapsed, whichever shall happen first.

11.2 Performance Security:

The successful bidder shall deposit, with the Regional District, when signing the Contract, the following:

a. Performance Bond:
A Performance Bond in the amount of fifty percent (50%) of the tendered price; and a

b. Labour and Materials Payment Bond:

A Labour and Materials Payment Bond in the amount of fifty percent (50%) of the tendered price

In the event of any breach, default, or non-performance by the successful bidder causing loss to the Regional District, then the Regional District may enforce the Labour and Materials Payment Bond, and/or Performance Bond as liquidated damages.

All bonds must be issued by a Surety Company authorized to do business in the Province of British Columbia.

12.0 CHANGES TO THE CONTRACT WORK

The Regional District, without invalidating the Contract, may make changes by altering, adding to, or deducting from the work. The Contractor will proceed with the work as changed and the work will be executed under the provisions of the Contract. No changes will be undertaken by the Contractor without written order of the Regional District, except in an emergency endangering life or property, and no claims for additional compensation will be valid unless the change was so ordered. The Regional District will entertain no payment for extra work or changes in the Contract unless a "Change Order" form is completed and signed by the Regional District, the Contractor and the Contractor.

13.0 INSURANCE

The Contractor shall, without limiting its obligations or liabilities, and at its own expense, provide and maintain throughout the Contract term, the following insurance with insurers licenced in the Province of British Columbia, in forms acceptable to the Regional District. All required insurance (except automobile insurance on vehicles owned by the Contractor) shall be endorsed to show the Regional District as additional insured and to require that the Regional District be provided with thirty (30) days' advance written notice of cancellation or material change. The Contractor will provide the Regional District with evidence of the required insurance, in a form acceptable to the Regional District, upon notification of award and prior to the execution and delivery of the Contract:

i. Commercial General Liability (CGL) in an amount not less than $5,000,000 inclusive per occurrence insuring against bodily injury and property damage and including liability assumed under the Contract. Such CGL coverage shall include the following liability extensions: Contingent Employers Liability, Broad Form Products & Completed Operations, Personal Injury, Blanket Contractual, and Cross Liability. The Regional District is to be added as an additional insured.

ii. Where the Contractor requires the use of Automobiles to undertake the work of the Contract, the Contractor will have the following:

   a. Automobile Liability on all vehicles owned, operated, or licenced in the name of the Contractor in an amount not less than $3,000,000 per occurrence.

b. Non-owned Automobile Liability insurance in an amount not less $3,000,000 per occurrence.

iii. Equipment insurance on all equipment owned or rented by the Contractor to its full insurable value.

The Contractor shall ensure that all sub-contractors forming from this Contract meet the insurance requirements outlined above.

It is the sole responsibility of the Contractor to determine if additional limits of liability insurance coverage are required to protect them from risk.

14.0 DAMAGE TO EXISTING PROPERTY

In the event of damage to the Regional District's property arising from actions of the Contractor the procedure will be as follows:

1. The Contractor will immediately advise the Regional District of any damage to the Regional District's property.
2. Upon investigation, the Regional District will notify the Contractor of damages to be repaired.
3. If the Contractor does not reply within seventy-two (72) hours, the Regional District will repair, to the appropriate specifications or regulations, and deduct the cost of the repair from payment to the Contractor.

15.0 WORKSAFEBC

The Contractor will use due care and take all necessary precautions to assure the protection of persons and property while undertaking the Work and will comply with the *Workers Compensation Act* of the Province of British Columbia.

Prior to undertaking any of the Work in this Service Agreement, the Contractor will provide the Regional District with a Clearance Letter confirming they are in good standing with WorkSafeBC and will pay and keep current all assessments required by WorkSafeBC in relation to the Service Agreement amount.

Out of Province Contractors will be compliant with WorkSafeBC's registration requirements pertaining to out of Province firms. Where WorkSafeBC registration requirements allow for a Contractor to be registered with another Province's Worker's Compensation Board, or like organization, the Contractor will provide the Regional District with their registration number and written documentation confirming that the Contractor is in good standing with the appropriate Worker's Compensation Board, or like organization. The Contractor will pay and keep current all assessments required to maintain good standing in relation to the Service Agreement amount.

The Contractor will maintain an Occupational Health and Safety Plan (OHSP) and ensure that their employees and Sub-Service Providers are well trained and aware of the OHSP.

16.0 INDEMNITY AND RELEASE BY CONTRACTOR

Notwithstanding the compliance of the Contractor with all the clauses concerning insurance, the Contractor shall indemnify, protect, and save harmless the Regional District, its officials, officers, employees, volunteers, servants, and agents from and against any and all liabilities, damages, losses, claims, costs, expenses of any kind whatsoever (including legal costs), and actions recoverable by any third party from the Regional District, arising from or caused by a negligent act or omission of, or breach of this Agreement on the part of, the Contractor, and shall be paid by the

Contractor. If the Regional District pays, or is required to pay, any damages, costs, or fees on account of the actions, claims and demands herein recited, or if the property of the Regional District shall be charged in any way as a result of the aforesaid actions, causes of actions, and claims for demands, then the Regional District shall be entitled to recover from the Contractor all such damages, costs, fees or other charges together with any costs or expenses incurred in so doing. The Contractor covenants and agrees that this clause shall survive the termination of the Contract herein granted.

17.0 FORCE MAJEURE

If either the Contractor or the Regional District are prevented from performing their obligations under the Contract, or where the Regional District's work in respect of which the Contractor is providing Services cannot be performed, because of an act of God, an act of a legislative, administrative or judicial entity, fire, flood, labour strike or lock-out, epidemic, unusually severe weather, or other similar cause outside of the control of the Parties (collectively "Force Majeure"), then the obligations of the Contractor and the Regional District under the Contract shall be suspended for so long as the condition constituting Force Majeure continues. The Party affected by Force Majeure shall provide the other Party with notice of the anticipated duration of the Force Majeure event, any actions being taken by the Party providing notice to avoid or minimize the effect of the Force Majeure event, and shall make reasonable efforts to remove or mitigate the effects of the condition constituting Force Majeure. Upon the termination of the Force Majeure event, the Regional District shall grant to the Contractor a time extension for performance of any milestone dates required as part of the Services as may be agreed with the Contractor or, if the Regional District and the Contractor are unable to reach agreement, as determined by the dispute resolution process under Section 28 of the Contract. Where as a result of Force Majeure there is a material increase in the Contractor's cost of or the time required for the performance of the Services that is not offset by a decrease in cost, then the Regional District shall increase the amount of the service fee payable to the Contractor under Section 10 of this Agreement, as may be agreed by the Contractor, or as determined under Section 28 of the Contract. If the event of Force Majeure results in a material increase in the cost of the work to be performed in respect of which the Contractor is providing the Services, then the Regional District may choose not to proceed with the completion of the work and may terminate this Agreement. If the Regional District terminates this Agreement following the termination of the Force Majeure event, then it shall compensate the Contractor in accordance with Section 6 of this Agreement.

18.0 OWNERSHIP AND FREEDOM OF INFORMATION

Tenders will be received and held in confidence by the Regional District, subject to the provisions of the *Freedom of Information and Protection of Privacy Act* and this ITT. Each tender should clearly identify any information that is considered to be confidential or propriety information. Tenderers are responsible to review the *Freedom of Information and Protection of Privacy Act* for further information.

All documents, including tenders, submitted to the Regional District become the property of the Regional District. The Regional District will provide a debriefing for tenderers, upon request by a tenderer, subject to the *Freedom of Information and Protection of Privacy Act*.

Any material produced, received or provided by the Regional District to the Contractor as a result of this Contract and any equipment, machinery, or other property provided by the Regional District to the Contractor as a result of this Contract will:

- be the exclusive property of the Regional District; and
- forthwith be delivered by the Contractor to the Regional District, or the manager giving written notice to the Contractor requesting delivery of the same, or at the end date of this Contract.

Any material produced by the Contractor, including but not limited to, drawings, schematics, equipment logs, reports, manuals, and any and all documents created that relate to the landfill gas well field expansion, shall be provided by the Contractor to the Regional District in an amenable format (i.e. Word, Excel, AutoCAD) and will become the property of the Regional District and the Regional District shall not be limited by Contractor's copyright or proprietary terms with regards to use by the Regional District.

19.0 CONFIDENTIALITY

In accordance with the *Freedom of Information and Protection of Privacy Act*, the Contractor will treat as confidential and will not, without the prior written consent of the Manager, publish, release or disclose or permit to be published, released or disclosed, any information supplied to, obtained by, or which comes to the knowledge of the Contractor as a result of this Contract except insofar as such publication, release or disclosure is necessary to enable the Contractor to fulfil his obligation under this Contract, or by the laws of British Columbia.

20.0 RIGHTS OF WAIVER

A waiver, or any breach of any provision of this ITT will not constitute or operate as a waiver, or any other breach, of any other provisions, nor will any failure to enforce any provision herein operate as a waiver of such provisions or of any other provisions.

21.0 SEVERABILITY

All paragraphs of the Contract are severable one from the other. Should a court of competent jurisdiction find that any one or more paragraphs herein are void or unenforceable, the validity of the remaining paragraphs hereof will not be affected.

22.0 SUPERVISOR AND LABOUR

The Contractor will keep a competent supervisor on the work site at all times and for the duration of the project. The Contractor will identify the person who will act as the supervisor, in writing, to the Regional District and the Engineering Contractor. The supervisor will represent the Contractor in their absence and directions given to them will be considered to have been given to the Contractor. The supervisor will have the ability to report to the Regional District and the Engineering Contractor and have the authority to act on contractual obligations on behalf of the Contractor. The Contractor shall employ at all times, qualified and experienced personnel to carry out the work.

The Contractor will comply with all federal and provincial legislation regarding wages and labour regulations including payment of any and all dues, levies, or charges made under or in relation to the Contract. The Contractor will make proof of payment available to the Manager when requested.

23.0 CHARACTER OF WORKERS

The Contractor and workers must have sufficient knowledge, skill and experience to perform properly the work assigned to them and to be tactful and courteous in dealing with the public and the Regional District's staff. Any supervisor or worker employed by the Contractor or Sub-Contractor who, in the opinion of the Owner does not perform their work in a competent manner, appears to act in a disorderly or intemperate manner, appears to be under the influence of drugs or alcohol, or is negligent, or willfully misconducts themselves will, at the written request of the Owner, be removed from the site of the work immediately and will not be employed again in any portion of the work without the approval of the General Manager of Environmental Services.

24.0 SUB-CONTRACTORS

The sub-contractors named in the Tender Form will not be changed nor will additional sub-contractors be employed except with the written approval of the Regional District. The Contractor is responsible to the Regional District for the acts and omissions of his sub-contractors and of their workers to the same extent that they are responsible for the acts or omissions of the Contractor's workers. Nothing in the Contract Documents will create any contractual relations between any sub-contractor and the Regional District. The Contractor will bind every sub-contractor to the terms of the Contract Documents.

25.0 REGIONAL DISTRICT'S TERMINATION OF CONTRACT

In the event of the breach or non-performance by the Contractor of any of the covenants, conditions, and agreements contained in the Contract to be performed, or stoppage under Clause 30.0, the Regional District reserves the right to terminate this Contract without notice. The Regional District may also deduct from the payments due to the Contractor any payments or expenditures it is required to make to remedy any such non-performance or breach hereof.

26.0 CONTRACTOR'S TERMINATION OF CONTRACT

The Contractor shall have the right to terminate the Contract in the event the Regional District fails to pay for the Work performed except as provided in the Contract Documents, within thirty (30) days from the specified date of payment and fails to remedy such default within ten (10) days of the Contractor's written notice to do so.

27.0 REGIONAL DISTRICT'S RIGHT TO CORRECT DEFICIENCIES

The Regional District shall have and retain full authority to inspect the work of the Contractor to ensure that the requirements of the Contract are being fulfilled. Upon failure of the Contractor to perform the work in accordance with the Contract Documents, and after five (5) days written notice to the Contractor, or without notice if any emergency or danger to the work or public exists, the Regional District may, without prejudice to any other remedy they may have, correct such deficiencies. The cost of work performed by the Regional District in correcting deficiencies shall be paid by the Contractor or may be deducted from monies payable to the Contractor.

28.0 DISPUTE RESOLUTION

If a claim, dispute, or controversy arises out of or relates to the interpretation, application, enforcement, or performance of services under this agreement, the Contractor and the Regional District agree first to try in good faith to settle the dispute by negotiations between the Contractor and the Regional District. If such negotiations are unsuccessful, the Contractor and the Regional District agree to attempt to settle the dispute by arbitration if both parties agree. If the dispute cannot be settled through arbitration, the Contractor and the Regional District may agree to attempt to settle the dispute through good faith mediation. If the dispute cannot be resolved through mediation and unless otherwise mutually agreed, the dispute shall be settled by litigation in an appropriate court in the Province of British Columbia.

29.0 PERMIT AND REGULATIONS

The Contractor will, at their own expense, unless pre-approved in writing by the Regional District, procure all other permits, certificates, and licences required by law for the execution of the work and will comply with all federal, provincial, and local laws and regulations affecting the execution of the work, save in so far as the Contract Documents specifically provide otherwise.

30.0 SCOPE OF WORK

The work generally comprises the following but is not limited to:

1. Construction of 16 new vertical Landfill Gas (LFG) extraction wells.
2. Construction of well field pipework (sub-headers and laterals) to tie in new LFG wells to existing wells to existing system.
3. New construction of isolation valves and sample ports.

31.0 LOCAL CONDITIONS

The Contractor will, by personal inspection, examination, calculations or tests, or by any other means, satisfy themselves with respect to the local conditions to be encountered and the quantities, quality and practicability of the Work and of their methods of procedure. No verbal agreements or conversation with any officer, agent or employee of the Regional District, either before or after the execution of the Contract, will affect or modify any of the terms or obligations herein contained.

32.0 MANAGER'S STATUS

The Manager or their delegate will be the Regional District's representative during the period of operation and will observe the Work in progress on behalf of the Regional District for the purpose of ensuring that the Work has been satisfactorily carried out. The Manager will have the authority to stop the Work whenever such stoppage may be necessary, in their opinion, to ensure the proper execution of the Work in accordance with the provisions of the Contract.

If at any time the Manager is of the opinion that there exists a danger to life or to property, they may order the Contractor to stop Work or to take such remedial measures as is considered necessary.

The Contractor will comply with such an order immediately. Neither the giving, nor the carrying out of such orders thereby, entitles the Contractor to any extra payment and the Regional District will not be held liable for any damages or any breach of laws, bylaws or regulations that may result.

33.0 PROTECTION OF WORK AND PROPERTY

The Contractor shall take all reasonable precautions necessary to protect the Regional District's property from damage during the performance of the Contract and shall make good on any damage to the Regional District's property caused by the Contractor, its Sub-Contractor, employees, or agents during the performance of the Contract.

34.0 OCCUPATIONAL HEALTH AND SAFETY

The Foothills Boulevard Regional Landfill is a multi-employer Work site as defined in the provincial *Workers' Compensation Act*. The Regional District of Fraser-Fort George is recognized as the prime contractor and is responsible for coordinating the occupational health and safety programs of all employees working at the Landfill. The Contractor will ensure that they follow all occupational health and safety policies and procedures established by the Regional District. Contractors, their employees or agents not complying with the Regional District's health and safety expectations will be required to stop Work and will not be allowed to resume Work until the safety requirements are met.

The Contractor will use due care and take all necessary precautions to assure the protection of persons and property at the Facility, the Landfill and points in between and will comply with the *Workers' Compensation Act* of the Province of British Columbia.

The Contractor, upon award of the contract, will submit a job specific health and safety plan including measures applied at the work site to meet COVID19 requirements that will be approved by the Regional District prior to the commencement of construction.

35.0 GOODS AND SERVICES TAX (GST)

Federal law states that five percent (5%) tax be paid on all goods and services. If the Contractor does not qualify as a small supplier then the Contractor is required to identify the tax (GST/PST, as applicable) on all invoices and the Regional District is liable to pay this amount to the Contractor.

36.0 REMOVAL OF LIENS

The Contractor will forthwith remove at their own expense liens, filed or registered against the Landfill and Facility properties and the Contractor will indemnify and save harmless the Regional District from liability arising out of any such claims of lien.

37.0 DISPUTED WORK

If, in the opinion of the Contractor, they are being required to perform work beyond that which the Contract requires him to do, whether at the discretion of the Regional District or otherwise, they will within five (5) days deliver to the Project Manager a written notice of protest in the form prescribed herein prior to proceeding with any of the disputed work. The five (5) day time period commences from the time of direction given by the Manager or the time at which the Contractor determines that he is required to perform such work, whichever occurs first.

The Contractor will keep accurate and detailed cost records that should indicate the cost of the work done under protest. The Contractor will not be entitled to payment if they fail to keep and produce such records.

38.0 NOTICE OF PROTEST

TO: General Manager of Environmental Services
Regional District of Fraser-Fort George
FROM: (Contractor)
DATE:

SUBJECT: THE CONTRACT

Date of Direction:

You have required me to perform the following work that is beyond the scope of the Contract.
(Set out details of work).
(Include dates where applicable)

The additional costs and claim for this work is as follows:
(Set out details of cost)

All supporting documentation and invoices are attached.

I understand that I am required to keep accurate and detailed cost records which will indicate the cost of the work done under protest and failure to keep such records will be a bar to any recovery by me.

Signature of Contractor

39.0 ATTACHMENTS

The following Appendices are attached to the Invitation to Tender:

- Appendix A – Specifications
- Appendix B – Drawings
- Appendix C – Contract Agreement and General Conditions (Refer to CCDC 4 2011)
- Appendix D – Supplemental General Conditions

ACKNOWLEDGEMENT LETTER

The undersigned has received a full set of ITT ES-20-16 – 2020 Landfill Gas Well Field Expansion – Construction Project - Foothills Boulevard Regional Landfill documents.

Authorized Signatory Signature	Name of Tenderer
Name (Please print)	Address
Title	City, Province, Postal Code
Phone Number	**Email**
Date	

I/We presently intend ☐ to provide ☐ not to provide a Tender.

Please return immediately by email to:

Darwin Paton Environmental Services Technician
Regional District of Fraser-Fort George
155 George Street
Prince George, BC V2L 1P8
Telephone: 250-960-4400
Fax: 250-562-8676

Email: dpaton@rdffg.bc.ca

TENDERER CHECKLIST

Before submitting your Tender, check the following points:

- ☐ Did you attend the Mandatory Site Meeting?
- ☐ Have you submitted the Acknowledgement Letter?
- ☐ Has the Tender Form been signed and witnessed?
- ☐ Has the Bid Bond been included?
- ☐ Has the Tender Form Summary been completed?
- ☐ Has the Schedule of Prices been completed?
- ☐ Has the Schedule of Additional Unit Prices been completed?
- ☐ Has the Preliminary Construction Schedule been completed?
- ☐ Has the Experience of Superintendent been completed?
- ☐ Has the List of Sub-Contractors been completed?
- ☐ Has the Tenderer's Experience in Similar Work been completed?
- ☐ Has the Goods and Services Tax Information been completed?
- ☐ Has the Conflict of Interest Disclosure Statement been completed?
- ☐ Are all amendments and/or addenda, if any, included and signed?
- ☐ Have you included three (3) complete copies of your tender submission?
- ☐ Is the submission enclosed in a fully labelled **sealed** envelope?
- ☐ Are the tender submission envelope and the courier envelope both labelled fully?

Note: Your tender may be disqualified if ANY of the applicable foregoing points have not been complied with.

Three (3) complete copies of your Tender must be submitted in a sealed envelope with the following information written on the outside of the envelope containing the tender, as well as on the outside of the courier envelope/box (if sending by courier):

- ☐ Attention: General Manager of Financial Services
  Regional District of Fraser-Fort George
  3rd Floor, 155 George Street
  Prince George, BC V2L 1P8

- ☐ Invitation to Tender ES-20-16
  2020 Landfill Gas Well Field Expansion
  Construction Project - Foothills Boulevard Regional Landfill

- ☐ Tenderer's name and address

TENDER FORM

Date: _____

Regional District of Fraser-Fort George
3rd Floor, 155 George Street
Prince George, BC V2L 1P8

ATTENTION: General Manager of Financial Services

Dear Sir/Madam:

Having carefully examined the Instructions to Tenderers, Form of Tender, Bid Bonds, Contract Agreement, General Conditions of Contract and Operational Specifications and subsequent written addenda (if any), and having visited the site(s) for purposes of examining site conditions and having satisfied myself/ourselves as to the sufficiency of the ITT, the undersigned agrees to furnish all labour, transportation, equipment, materials, supervision and services and to do all work necessary for and reasonably incidental, as specified in accordance with the ITT, to do the work.

I/We agree that in consideration of having my/our tender submission considered for the Total Contract Price as shown on the Schedule of Prices, this price is open for acceptance for sixty (60) days from the date of the tender opening and will not be withdrawn during that period of time.

It is understood that payment will be made for the work on the basis of the awarded Contract only and that any approved extras or refunds will be made by mutual agreement between the Regional District and me/us.

I/We agree that the sub-contractor(s) employed will be as listed on the List of Sub-Contractors and further agree that no changes or additions will be made to the list without written approval of the Regional District.

If I am/we are notified in writing of the acceptance of our tender, I/we agree that within fourteen (14) days of the date of the acceptance notice I/we will enter into a contract and execute an agreement for the stated sum in the form of the specimen submitted to guarantee completion of the contract in accordance with the contract documents and within the time stated in the Tender documents.

I/We agree that the Regional District reserves the right to waive informalities in tenders, reject any or all tenders, or accept the tender deemed most favourable in the interests of the Regional District.

I/We agree that tenders which contain qualifying conditions or otherwise fail to conform to the instructions contained in this ITT may be disqualified or rejected. I/We agree that the Regional District may, however, in its sole discretion, reject or retain for its consideration tenders which are non-conforming because they do not contain the content or form required by the ITT, or for failure to comply with the process for submission set out in the ITT, whether or not such non-compliance is material.

Accompanying this Tender, please find our bid bond as the security deposit in the amount of ten percent (10%) of the contract value.

I/We agree that except for a claim for the reasonable cost of preparation of this tender, by submitting a tender, I/We irrevocably waive any claim, action, or proceeding against the Regional District including,

without limitation, any judicial review or injunction application, and any claim against the Regional District and its elected officials, officers and employees for damages, expenses or costs, loss of profits, loss of opportunity or any consequential loss for any reason, including any such claim, action or proceeding arising from:

1) any actual or alleged unfairness on the part of the Regional District at any stage of the tender process, including without limitation any alleged unfairness in the evaluation of a tender or award of a contract;

2) a decision by the Regional District not to award a contract to that tenderer; or

3) the Regional District's award of a contract to a tenderer whose tender does not conform to the requirements of this ITT.

I/We hereby acknowledge receipt and inclusion of the following addenda to the ITT Documents:

Addendum No. _____ dated:_____ Addendum No. _____ dated:_____

Addendum No. _____ dated: _____ Addendum No._____ dated: _____

Addendum No. _____ dated: _____ Addendum No._____ dated: _____

Signed and Delivered by:

Signature of Authorized Signatory	Name of Tenderer
Name of Authorized Signatory (Please print)	Address
Title	City, Province, Postal Code

Signed in the presence of:

Signature	Address
Name of Witness (Please print)	City, Province, Postal Code

TENDER FORM SUMMARY

TENDER FORM SUMMARY	**Price (excluding taxes)**
(A) Schedule of Prices	$ _____
(B) Schedule of Additional Unit Prices	$ _____
TENDER PRICE – EXCLUDING GST	$ _____
GST as applicable	$ _____
TOTAL TENDER PRICE – INCLUDING GST	**$** _____

SCHEDULE OF PRICES

DIVISION	Unit	Quantity	Unit Price	PRICE (excluding taxes)
Section 01 35 29.06/1 – Health and Safety Plan	L.S.		$_____	$ _____
Section 01 71 13/1 – Mobilization	L.S.		$_____	$ _____
Section 01 71 13/2 – Startup	L.S.		$_____	$ _____
Section 01 73 00/1 – Surveying	L.S.		$_____	$ _____
Section 01 73 00/2 – Nitrogen Purging – Well Field	L.S.		$_____	$ _____
Section 01 77 00/1 – Demobilization and Closeout	L.S.		$_____	$ _____
Section 23 05 05/01 – Subheader Pipe	L.M.	475	$_____	$ _____
Section 23 05 05/02 – Lateral Pipe	L.M.	570	$_____	$ _____
Section 23 05 05/03 – Hydrostatic Pressure Testing	L.S.		$_____	$ _____
Section 23 05 06/01 – 150 mm Subheader Isolation Valve and Sample Port	Per	6	$_____	$ _____
Section 23 05 06/02 – 150 mm Horizontal Trench Isolation Valve and Sample Port	Per	3	$_____	$ _____
Section 33 21 14/01 – Vertical Extraction Wells	L.M.	270	$_____	$ _____
Section 33 21 14/02 – Wellhead Assemble	Per	18	$_____	$ _____
TENDER PRICE – EXCLUDING GST				$ _____
GST as applicable				**$** _____
TOTAL TENDER PRICE – INCLUDING GST				**$** _____

SCHEDULE OF ADDITIONAL UNIT PRICES

DIVISION	Unit	Quantity	Unit Price	PRICE (excluding taxes)
Section 31 23 10/01 – Over Excavation	C.M.		$_____	$ _____
Section 33 21 14/01 – Borehole Refusal	L.M.		$_____	$ _____
TOTAL TENDER PRICE – EXCLUDING GST				$ _____
GST as applicable				**$** _____
TOTAL TENDER PRICE – INCLUDING GST				**$_____**

PRELIMINARY CONSTRUCTION SCHEDULE

INDICATE SCHEDULE WITH BAR CHART WITH MAJOR ITEM DESCRIPTIONS AND TIME

MILESTONE DATES _____

ACTIVITY	CONSTRUCTION SCHEDULE									
	1	2	3	4	5	6	7	8	9	10

EXPERIENCE OF SUPERINTENDENT

Name: _____

Experience:

Dates: _____

Project Name: _____

Responsibility: _____

_____

_____

References: _____

Dates: _____

Project Name: _____

Responsibility: _____

_____

_____

References: _____

Dates: _____

Project Name: _____

Responsibility: _____

_____

_____

References: _____

LIST OF SUB-CONTRACTORS

The Contractor agrees that the Sub-contractors employed by them will be as listed below and further agrees that no changes or additions will be made to their list without the written approval of the Regional District.

Name of Sub-Contractor	Address of Sub-Contractor	Work to Be Performed by Sub-Contractor

TENDERER'S EXPERIENCE IN SIMILAR WORK

Year	Work Performed	Reference Contact (name and phone number)	Value

GOODS AND SERVICES TAX INFORMATION

Supplier: _____
Name

_____
Address

_____
City Province

_____
Postal Code Phone Number

Are you a GST Registrant? Yes _____ No _____

If YES, please indicate your registration number: _____

If NO, Please fill in the following (check appropriate box):

❑ Supplier qualifies as a small supplier under s.148 of the legislation

❑ Other: Specify_____

_____ _____
Signature of Authorized Person Print Name

_____ _____
Title Date

CONFLICT OF INTEREST DISCLOSURE STATEMENT

PROCUREMENT PROCESS

ES-20-16 2020 Landfill Gas Well Field Expansion
Construction Project - Foothills Boulevard Regional Landfill

Bidder Name:_____

The Bidder, including its officers, employees, and any person or other entity working on behalf of or in conjunction with, the Bidder on this Procurement Process:

- ☐ is free of any conflict of interest that could be perceived to improperly influence the outcome of this procurement process.
- ☐ has not, and will not, participate in any improper procurement practices that can provide the Bidder with an unfair competitive advantage including obtaining and using insider type information to prepare a solicitation offer or participating in bid rigging.
- ☐ has an actual, perceived or potential conflict of interest regarding this procurement process as a result of:

State reason(s) for Conflict of Interest:

_____

_____

_____

_____

By signing below I certify that all statements made on this form are true and correct to the best of my knowledge.

_____
Print Name of Person Signing Disclosure

_____ _____
Signature of Person Making Disclosure Date Signed

APPENDICES

- Appendix A – Specifications
- Appendix B – Drawings
- Appendix C – Contract Agreement and General Conditions (Refer to CCDC 4 2011)
- Appendix D – Supplemental General Conditions

APPENDIX A - SPECIFICATIONS

TABLE OF CONTENTS

General Specifications

Civil Specifications

PART 1 GENERAL

1.1 SCOPE

.1 Includes general project description, drawing list, project schedule, and date for substantial performance.

1.2 SECTION INCLUDES

.1 Summary of Work.

.2 Drawings.

.3 Project Coordination.

.4 Furnishing of Documents.

.5 Construction Records.

.6 Time.

.7 Completion Date.

.8 Schedule.

.9 Hours of Work.

.10 Conduct of the Work.

.11 Oral Agreements.

.12 Measurement and Payment.

1.3 SUMMARY OF WORK

.1 Title and description of Work:

.1 2020 Landfill Gas Wellfield Expansion and Construction located at the Foothills Boulevard Regional Landfill, located at Prince George, British Columbia, Block A of the NW ¼ of District Lot 4052, and Block A of the NW ¼ of District Lot 4048, Cariboo District.

.2 The works of this project involve the expansion of the existing landfill gas well field at the Foothills Boulevard Regional Landfill, for the Regional District of Fraser-Fort George (Owner).

.3 The 2020 Landfill Gas Wellfield Expansion and Construction will generally consist of supply and installation of all well field pipeworks and tie-in to existing infrastructure.

.4 Work includes:

.1 Construction of 16 new vertical LFG extraction wells.

.2 Construction of well field pipework (subheaders and laterals) to tie in new and existing wells to existing system.

.3 New construction of Isolation Valves.

1.4 Drawings

.1 Drawings issued with and forming part of the contract documents are as follows:

Drawing No.	Revision No.	Date	Title
C100	B	July 2020	Existing Conditions
C101	B	July 2020	Proposed Wellfield Plan
C201	B	July 2020	Details – Vertical Extraction Well – 1
C202	B	July 2020	Details – Pipeworks – 1
C203	B	July 2020	Details – Pipeworks – 2

1.5 PROJECT COORDINATION

.1 Coordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities and construction facilities and controls.

.2 Maintain at job site, one copy each of the following:
- .1 Contract drawings and specifications.
- .2 Addenda.
- .3 Reviewed shop drawings.
- .4 Change Orders/Instructions.
- .5 Other modifications to Contract.
- .6 Field test reports.
- .7 Approved Work schedule.
- .8 Manufacturer's installation and application instructions.
- .9 Records of site safety meetings in compliance with the Workplace Safety and Health Act.

1.6 FURNISHING OF DOCUMENTS

.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of Conforming Contract Documents (including 11x17 Construction Plans). If the Contractor requires additional sets of the Bid Opportunity or drawings, they will be supplied in pdf format any hard copies will be supplied to him/her at cost.

1.7 CONSTRUCTION RECORDS

.1 Construction records shall be the responsibility of the Engineer whom the Leduc and District Regional Waste Management Authority comes to agreement with. The agreement will be separate from this Tender.

.2 In addition to requirements in General Conditions, maintain on site one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to the Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Further to the General Conditions, record actual site conditions on a set of marked up Contract Drawings. Identify the Drawings containing the Contractor’s records of changes as the "Project Record Copy".

.6 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.7 Contract Drawings and shop drawings: accurately and legibly mark each item to record actual construction, including:

- .1 All deviations from Contract Documents caused by site conditions
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements
- .3 Locations of all pipes, valves and fittings to be buried.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders or ordered by the Engineer, including a full description of the change, date of the approved change, and reason for deviation from original design.
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.

.8 Project Record Copy of Specifications: legibly mark each item to record actual construction, including:

- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.

.9 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

.10 Make record documents and Project Record Copies available for inspection on site by the Engineer at all times.

.11 Not less than four (4) weeks prior to application for the Final Certificate of Completion, submit the Project Record Copy of Drawings to the Engineer for review.

1.8 TIME

.1 Time is of the essence for this Work.

1.9 COMPLETION DATE

.1 Complete the Work by November 1, 2020 (Substantial Performance).

1.10 SCHEDULE

.1 Schedules Required

.1 Construction Progress Schedule will be completed by the Contractor and submitted to the Engineer within five (5) days after Award of Contract.

.2 Format

.1 Prepare schedules in form of horizontal bar chart.

.2 Provide separate bar for each trade or operation.

.3 Provide horizontal time scale identifying first work day of each week.

.4 Format for listings: Chronological order of start of each item of Work.

.5 Indicate the following:

.1 Commencement and completion of work of each section of the specification conforming to the Project milestones and daily operation requirements.

.2 The major items of work for this contract are as follows:

1. Award.
2. Shop Drawings.
3. Mobilization.
4. Survey and Well Field Layout.
5. Well Field Drilling.
6. Extraction Well Decommissioning.
7. Wellhead Installation.
8. Well Field Pipeworks Installation, including Subheader, Laterals, and Isolation Valves.
9. Tie-in to Existing Infrastructure.
10. Demobilization.

.3 Final completion date within time period required by Contract Documents.

1.11 HOURS OF WORK

.1 The Contractor shall carryout the Work during the daylight hours of any weekday and 7 AM to 5 PM and must not create a nuisance or disturb the peace unnecessarily. Permission to work outside of these times must be obtained from the Engineer and be conducted at no additional cost to the Contract.

.2 No weekend work will be permitted except in the case of an emergency, or if directed by the Engineer.

.3 The Contractor shall obtain the necessary permission and permits from the governing body to work on weekends, nights, or statutory holidays, when this is necessary.

1.12 CONDUCT OF THE WORK

.1 Protection and Safety Precautions

.1 Comply with all requirements of provincial occupational health and safety regulations.

.2 The Contractor shall provide the necessary precautions to safeguard against any fire or explosion hazards during construction. The Contractor shall further provide adequate safety protection for personnel engaged on this Work and for all others who are exposed to the Work environment under this Contract.

.3 Adequate and sufficient guards for the prevention of accidents shall be installed and maintained by the Contractor at the construction site. The Contractor shall further provide adequate and sufficient safety lighting at night and during periods of poor visibility.

.4 The Contractor shall assume full responsibility for, and be liable for, any loss, injury or damage incurred to abutting property, structures, vehicles, pedestrians and animals caused through neglect by the Contractor or his employees during construction operations.

.2 Cooperation with Others

.1 The Contractor's attention is directed to the fact that other contractors and landfill personnel may be working in the areas on or adjoining the site.

.2 The activities of these entities may coincide with the Contractor's execution of the Work, and it will be the Contractor's responsibility to cooperate to the fullest extent with personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of this Contract.

.3 The Contractor must be respectful of area residents with respect to not working outside the hours of work and minimizing noise.

.3 Existing Services and Utilities

.1 No responsibility will be assumed by the Owner or the Engineer for correctness or completeness of the Drawings with respect to the existing utilities, pipes or other objects either underground or on the surface, and neither the Owner nor the Engineer shall be liable for the incorrectness and inadequacy thereof. It shall be the responsibility of the Contractor to determine the location of all such utilities, pipes and other objects and to make good any damage done to them.

.2 The Contractor will arrange for the relocation of existing utilities, poles, traffic signals, signs and lamp posts which interfere with the proposed construction where noted on the construction drawings. The Contractor shall make the necessary arrangements for and pay the cost of all relocations required.

.4 Contractor to Notify Utilities and Other Authorities

.1 Make timely application to authorities for required permits before starting work on a public right-of-way.

.2 Obtain utility clearances for underground plant in the vicinity of the Work before starting construction.

.3 Arrange with utilities to provide Safety Watch where required during construction.

.5 Existing Trees, Shrubbery, Naturalized Plants Etc.

.1 No trees whatsoever shall be cut down without the written permission of the Engineer. Trees, shrubbery, fences, poles and all other private property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer.

.6 Damage to Streets and Structures

.1 Other than required to be done by the Contractor under the work of this Contract, all necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing pavements, streets, roads, boulevards, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers or other existing facilities and equipment at the site of the Work. For all damage incurred thereto in the performance of the Work, the Contractor shall upon instructions from and to the satisfaction of the Engineer and the owners thereof, either replace or repair such damage, whichever may be deemed necessary in the opinion of, and acceptable to, the Engineer and the owners thereof and the costs of which shall be borne entirely by the Contractor. The Contractor shall also indemnify and save harmless the Owner from all claims made directly or indirectly against it in respect to any such damage.

.2 Damage by the Contractor to existing utilities in the performance of the Work, the owners of the utilities gas pipes, electrical wires, communication cables, conduits will carry out the replacement or repairs owned of the utility. The Contractor shall still be responsible for the costs of the repairs.

.7 Surface Restoration Following Underground Works

.1 Unless otherwise specified, the Contractor shall be responsible for all surface restoration equal to or better than the original condition.

.2 The Contractor shall make himself fully aware of the conditions in the Work area prior to submitting his Tender and no payment will be made for any Work required as per this item.

.3 Arrangements shall be made by the Contractor with the Authority concerned regarding restoration of surfaces, where such surface restoration is not specifically detailed herein. The Contractor shall bear the full expense involved in replacing the surfaces to the satisfaction of the Authority having jurisdiction.

.4 It shall be the Contractor's responsibility to maintain all surfaces over the pipe trench, including pavement, boulevards, curbs, sidewalks, culverts, etc., to the satisfaction of the Authorities until permanent repairs have been made.

.5 All ditches damaged during construction shall be graded and restored upon completion of the installation to conditions equal or better prior to construction. All costs for restoration is incidental to the Works performed.

.6 The Contractor will also be responsible to maintain the drainage of the existing ditches during the construction period. Surface restoration and clean-up shall be done in a timely matter of two weeks behind the installation crews.

.8 Protection of Survey Bars

.1 The Contractor shall not disturb, deface, alter, destroy or remove any survey post, monument or bar and if the same shall occur, then, and in every such case, the Engineer shall have such post, monument or bar replaced at the expense of the Contractor. The Contractor shall pay all costs and expenses incurred in connection therewith.

.2 If the Contractor is in doubt about the location of the bars in the field, he will contact the Engineer before doing any Work in the area. Other survey posts, monuments, or bars may exist and the Contractor shall exercise care at intersections and other places where such survey posts, monuments or bars may exist.

.3 Where a survey bar lies in the line of the proposed work and must be disturbed, the Contractor shall provide the Engineer with seventy-two (72) hours notice to have the survey bar referenced and relocated. The survey bar shall be referenced and replaced at no cost to the Contractor.

.9 Continued Facility Operation

.1 The Leduc & District Regional Landfill shall remain operational throughout the duration of this Contract.

.2 Keep temporary interruptions to roadways and site infrastructure to an absolute minimum. Make such interruptions at the convenience of the occupants and obtain the approval of the Engineer, as to the time and duration.

.3 Any temporary roadway closures shall be coordinated with the Engineer and shall not impede access to the Site by the public or operations staff. Any temporary road closures shall be undertaken outside of the landfill's normal operating hours or by providing temporary alternative site access as approved by the Engineer.

1.13 ORAL AGREEMENTS

.1 In the case of misunderstandings, disputes, or interpretation of the Contract Documents, oral agreements will not be considered.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section describes the basis of payment that will apply to this contract.

1.2 SECTION INCLUDES

.1 Reference Standards.

.2 Measurement.

.3 Rejected Products.

.4 Application for Progress Payment.

.5 Schedule of Values.

.6 Preparing Schedule of Unit Price Table Items.

.7 Progress Payment.

.8 Substantial Performance of Work.

.9 Payment of Holdback Upon Substantial Performance of Work.

.10 Progressive Release of Holdback.

.11 Final Payment.

.12 Measurement and Payment.

1.3 REFERENCE STANDARDS

.1 Owner/Contractor Agreement.

1.4 MEASUREMENT

.1 Measurement for Unit Price Work: As specified in individual Sections. Quantities indicated in the Schedule of Prices are for bidding and contract purposes only and are approximate. Quantities of material furnished and/or work performed as verified by Engineer determine payment.

1.5 REJECTED PRODUCTS

.1 Non-payment for rejected products: Payment will not be made for any of the following:

- .1 Products determined as unacceptable before or after placement.
- .2 Products not completely unloaded from the transporting vehicle.
- .3 Products placed beyond the lines and levels of the required Works.
- .4 Products remaining after completion of the Works.
- .5 Loading, hauling, and disposing of rejected products.

1.6 APPLICATIONS FOR PROGRESS PAYMENT

.1 Make applications for payment on account as monthly as Work progresses.

.2 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

.3 Submit to Engineer, at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.7 SCHEDULE OF VALUES

.1 Provide schedule of values supported by evidence as Engineer may reasonably direct and when accepted by Engineer, be used as basis for applications for payment.

.2 Include statement based on schedule of values with each application for payment.

.3 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Engineer may reasonably require to establish value and delivery of products.

1.8 PREPARING SCHEDULE OF UNIT PRICE TABLE ITEMS

.1 Submit separate schedule of unit price items of Work requested in Tender Form.

.2 Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:

.1 Cost of material.

.2 Delivery and unloading at site.

.3 Sales taxes.

.4 Installation, overhead and profit.

.3 Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Prices.

1.9 PROGRESS PAYMENT

.1 Engineer will issue to Owner, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Engineer determines to be due. If Engineer amends application, Engineer will give notification in writing giving reasons for amendment.

1.10 SUBSTANTIAL PERFORMANCE OF WORK

.1 Prepare and submit to Engineer comprehensive list of items to be completed or corrected and apply for a review by Engineer to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.

.2 No later than 10 days after receipt of list and application, Engineer will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

.3 Engineer: state date of Substantial Performance of Work or designated portion of Work in certificate.

.4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Engineer, establish reasonable date for finishing Work.

1.11 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 After issuance of certificate of Substantial Performance of Work:

.2 Submit application for payment of holdback amount.

.3 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

.4 After receipt of application for payment and sworn statement, Engineer will issue certificate for payment of holdback amount.

.5 Where holdback amount has not been placed in a separate holdback account, Owner will, 10 days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of Owner and Contractor.

.6 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against Owner.

1.12 PROGRESSIVE RELEASE OF HOLDBACK

.1 Where legislation permits, if Engineer has certified that Work of subcontractor or supplier has been performed prior to Substantial Performance of Work, Owner will pay holdback amount retained for such subcontract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.

.2 In addition to provisions of preceding paragraph, and certificate wording, ensure that such subcontract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

1.13 FINAL PAYMENT

.1 Submit application for final payment when Work is completed.

.2 Engineer will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. Engineer will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.

.3 Engineer will issue final certificate for payment when application for final payment is found valid.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 Arrange and conduct meetings to communicate vital information between Owner, Engineer, Contactor and Major Subcontractors.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Administrative.

.3 Preconstruction Meetings.

.4 Progress Meetings.

.5 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 52 00 - Construction Facilities

.2 Section 01 56 00 - Temporary Barriers and Enclosures

1.4 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of the Engineer.

.2 Engineer shall prepare agenda for meetings, record the minutes of progress meetings, include significant proceedings and decisions. and identify "action by" parties and date for completion of duty.

.3 Engineer shall distribute written notice of each meeting 5 days in advance of meeting date to Contractor.

.4 The Contractor shall provide physical space, table and chairs for all participants.

.5 Representatives of Contractor, Subcontractor and Suppliers attending meetings must be qualified and authorized to act on behalf of the party each represents.

1.5 PRECONSTRUCTION MEETING

.1 Engineer will schedule and administer a pre-construction meeting at the Site after the date of the Notice to Proceed and prior to start of construction.

.2 Engineer will make arrangements for meeting, prepare agenda with copies for participants, and preside at meeting. Provide data required to Engineer and be prepared to discuss all items on the agenda.

.3 Minimum Attendance Required: Contractor, Contractor's health and safety officer, and major Subcontractors.

.4 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.5 Agenda will include, but will not necessarily be limited to, the following:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work.

.3 Schedule of submission of shop drawings.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.

.5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.7 Owner provided products.

.8 Monthly progress claims, administrative procedures, photographs, hold backs.

.9 Appointment of inspection and testing agencies or firms.

.10 Insurances, transcript of policies.

.11 Designation of responsible personnel.

.12 Lines of authority and communication.

.13 Health and safety.

.14 Submittal list and schedule.

.15 Use of the Site for storage, vehicle parking, access routes, and other Site requirements.

.16 Coordination with Owner.

.6 Procedures for processing field decisions, submittals, substitutions, applications for payments, proposal requests, Field Orders, Work Change Directives, Change Orders, and closeout procedures

1.6 PROGRESS MEETINGS

.1 Schedule and administer progress meetings throughout the progress of the Work every week.

.2 Contractor, major subcontractors involved in work, Engineer and Owner are to be in progress.

.3 Notify parties minimum 5 days prior to meetings.

.4 Engineer to record minutes of meetings and circulate to attending parties and affects parties not in attendance within 5 days after meeting.

.5 Agenda for progress meetings to include the following:

.1 Review and approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, and conflicts.

.4 Problems which impede construction schedule.
.5 Review of off-site fabrication delivery schedule.
.6 Corrective measures and procedures to regain projected schedule.
.7 Revisions to construction schedule.
.8 Progress, schedule, during succeeding work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Pending changes and substitutions.
.12 Review proposed changes for effect on construction schedule and on completion date.
.13 Other business.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers procedures and requirements for submission of documents, data, drawings and samples related to the Works.

1.2 SECTION INCLUDES

.1 Administrative.

.2 Shop Drawings and Product Data.

.3 Samples.

.4 Measurement and Payment.

1.3 ADMINISTRATIVE

.1 Submit to Engineer submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Engineer. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer’s review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer’s review.

.10 Keep one reviewed copy of each submission on site.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 The term shop drawings means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Alberta, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for Engineer’s review of each submission.

.5 Adjustments made on shop drawings by Engineer are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Engineer prior to proceeding with Work.

.6 Make changes in shop drawings as Engineer may require, consistent with Contract Documents. When resubmitting, notify Engineer in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.9 After Engineer’s review, distribute copies.

.10 Submit electronic copy or 4 printed copies of shop drawings for each requirement requested in specification Sections and as Engineer may reasonably request.

.11 Submit electronic or 4 printed copies of product data sheets or brochures for requirements requested in specification Sections and as requested Engineer where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic or 4 printed copies of test reports for requirements requested in specification Sections and as requested by Engineer.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 2 years of date of contract award for project.

.13 Submit electronic or 4 printed copies of certificates for requirements requested in specification Sections and as requested by Engineer.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic or 4 printed copies of manufacturer’s instructions for requirements requested in specification Sections and as requested by Engineer.

.1 Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic or 4 printed copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Engineer.

.16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.17 Submit electronic or 4 printed copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Engineer.

.18 Delete information not applicable to project.

.19 Supplement standard information to provide details applicable to project.

.1 Shop drawings will be returned to the Contractor with one (1) of the following notations:

.1 When stamped "ACCEPTED", issue construction copies as required for execution of the Work.

.2 When stamped "ACCEPTED AS NOTED" make the necessary revisions consistent with the Contract before issuing for Construction.

.3 When stamped "REVISE AND RE-SUBMIT", make the necessary revisions, consistent with the Contract, and submit again for review.

.4 When stamped "REJECTED", submit other drawings, brochures, etc., for review consistent with the Contract.

.5 Only shop drawings bearing "ACCEPTED" or "ACCCEPTED AS NOTED" and have been stamped "ISSUED FOR CONSTRUCTION" shall be used on the Work and for fabrication of the products unless otherwise authorized by the Consultant.

.2 After submittals are stamped "ACCEPTED" or "ACCEPTED AS NOTED", no further revisions are permitted unless re-submitted to the Consultant for further review.

.3 Any adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If it is deemed that such adjustments affect the Contract Price, clearly state as such in writing prior to proceeding with fabrication and installation of the work.

.4 Fabrication of products shall not commence until shop drawings have been reviewed by the Consultant and found not to require re-submission.

.5 Shop drawings indicating design requirements not included in the Contract Documents require the seal of a Professional Consultant, registered in the province of Manitoba. Consultant calculations must be submitted for review, if requested, and must be signed by a Professional Consultant.

1.5 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Engineer.

.3 Notify Engineer in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples Engineer are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Engineer prior to proceeding with Work.

.6 Make changes in samples which Engineer may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

.1 Develop a written Site specific Health and Safety Plan prior to commencing any on Site work and continue to implement, maintain, and enforce the plan until final demobilization from the Site.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Action and Informational Submittals.

.4 Filing of Notice.

.5 Safety Assessment.

.6 Meetings.

.7 General Requirements.

.8 Responsibility.

.9 Compliance Requirements.

.10 Unforeseen Hazards.

.11 Health and Safety Coordinator.

.12 Posting of Documents.

.13 Correction of Non-Compliance.

.14 Work Stoppage.

.15 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 29 00 – Payment Procedures

1.4 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Province of British Columbia

.1 Occupational Health and Safety regulation, B.C. Reg. 279/2019 – Last Amended April 6, 2020.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Engineer within 5 days after receipt of comments from Engineer.

.4 Engineer’s review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.6 FILING OF NOTICE

.1 File notice of project with Provincial authorities prior to beginning of Work.

1.7 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.8 MEETINGS

.1 Schedule and administer Health and Safety meeting with Engineer prior to commencement of Work.

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

Engineer may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Regulation, B.C. Reg. 279/2019 – Last Amended April 6, 2020.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.12 SITE CHARACTERIZATION

.1 Work at the Site may involve contact with solid waste and associated contaminants including but not limited to landfill leachate and landfill gas.

.2 Landfill Gas:

.1 Landfill gas may be present in the soil adjacent to the landfill during excavation.

.2 Landfill gas results from the decomposition of refuse and is primarily composed of 40 to 60 percent methane, and 30 to 50 percent carbon dioxide, less than 2 percent nitrogen, less than 1 percent oxygen, and trace gases including mercaptans, hydrocarbons, solvents, water vapor, and hydrogen sulfide.

.3 Methane is explosive in concentrations between 5 and 15 percent by volume in air. Methane, carbon dioxide, and nitrogen are simple asphyxiants.

.4 Trace gases in landfill gas may be toxic and odorous. Odorous gases cause nausea in some persons. Toxic gases may also be present at concentrations above or below the levels deemed safe for human exposure; there is always a potential for levels to be sufficient to cause permanent and irreversible damage and even death.

.3 Leachate: Leachate is wastewater containing organic and inorganic compounds that is produced when water and other liquids seep through the landfilled waste. Leachate characteristics and rate of production vary based on waste type and climate. Leachate may be present in all excavations within, and immediately adjacent to, the landfilled waste. General safety considerations used for handling non-hazardous wastes should be used where there is the potential to come into contact with leachate.

.4 Landfill Stability: Landfill waste must be considered prone to instability that may cause slope or sidewall failure due to the high void ratio, irregularity of material composing the waste, and a typically lesser degree of compaction than soil.

1.13 UNFORESEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Regulations of British Columbia, and advise Engineer verbally and in writing.

.2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety Coordinator and follow procedures in accordance with Regulations of British Columbia and advise Engineer verbally and in writing.

1.14 HEALTH AND SAFETY COORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities associated with building construction and earthworks.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of the site supervisor].

1.15 AIR MONITORING

.1 Air Monitoring Program:

.1 Provide the required instruments for air monitoring including, as a minimum, an oxygen level meter, an H2S meter, and a combustible gas meter (LEL meter). Provide sufficient numbers of each instrument to monitor the active work location(s) and to provide backup equipment in cases of equipment malfunction.

.2 Operate, maintain and calibrate air monitoring equipment with personnel trained in the use of the specific equipment provided and under the control of Health and Safety Officer. Monitoring equipment used shall be intrinsically safe.

1.16 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Regulations of British Columbia, and in consultation with Engineer.

1.17 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Engineer.

.2 Provide Engineer with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Engineer may stop Work if non-compliance of health and safety regulations is not corrected.

1.18 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures.

4.2 HEALTH AND SAFETY PLAN

.1 Schedule of Prices Item No. 01 35 29.06/1

.2 Payment Basis: Lump sum price. Includes development, submittal, and implementation of Health and Safety Plan.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

.1 Be responsible for environmental control requirements for the overall site within the limits of the contract, including monitoring of erosion and sedimentation control and maintenance.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Definitions.

.4 Submittals.

.5 Fires.

.6 Disposal of Waste.

.7 Drainage.

.8 Site Clearing and Plant Protection.

.9 Work Adjacent to Waterways.

.10 Pollution Control.

.11 Historic/Archaeological Control.

.12 Notification.

.13 Cleaning.

.14 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 73 00 - Execution

.3 Section 01 77 00 – Closeout Procedures and Submittals

1.4 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.5 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.6 FIRES

.1 Fires and burning of rubbish on site is not permitted.

1.7 DISPOSAL OF WASTE

.1 Do not bury waste on-Site unless approved by Engineer or Owner.

.2 Do not dispose of waste or volatile materials, such as spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.8 DRAINAGE

.1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan.

.2 Provide temporary drainage and pumping required to keep excavations and site free from water.

.3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.4 Do not pump water containing suspended materials into waterways, sewer or drainage systems

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

.6 The Contractor shall provide erosion control devices such as silt fences as required to satisfy local authority requirements, or as directed by Engineer.

1.9 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties.

.2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 metre minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.4 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.5 Minimize stripping of topsoil and vegetation.

.6 Restrict tree removal to areas designated by Engineer.

1.10 WORK ADJACENT TO WATERWAYS

.1 Construction equipment to be operated on land only.

.2 Use waterway beds for borrow material only after written receipt of approval from Engineer.

.3 Waterways to be kept free of excavated fill, waste material and debris.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

.6 Avoid indicated spawning beds when constructing temporary crossings of waterways.

1.11 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.1 Provide temporary enclosures where indicated.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.12 NOTIFICATION

.1 Engineer will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor’s Environmental Protection Plan.

.2 Contractor: after receipt of such notice, inform Engineer of proposed corrective action and take such action for approval by Engineer.

.1 Take action only after receipt of written approval by Engineer.

.3 Engineer will issue stop order of work until satisfactory corrective action has been taken.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CLEANING

.1 Progress Cleaning:

.1 Site cleaning in accordance with 01 73 00 – Execution.

.2 Leave Work area clean at end of each day.

.2 Bury rubbish and waste materials on site where directed after receipt of written approval from Engineer.

.3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

.4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with 01 77 00 – Closeout Procedures and Submittals.

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers the portions of Work that involve Quality Control, including, but not limited to inspections, testing, administrative and enforcement requirements.

1.2 SECTION INCLUDES

.1 Inspection.

.2 Independent Inspection Agencies.

.3 Access to Work.

.4 Procedures.

.5 Rejected Work.

.6 Reports.

.7 Equipment and Systems.

.8 Measurement and Payment.

1.3 INSPECTION

.1 Allow Engineer access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Engineer Instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Unless otherwise allowed for in the Contract, Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner. The testing agency shall report all test results directly to the Consultant with original copies. Photocopies addressed to the Contractor will be unacceptable.

.2 The Contractor cannot rely on the testing that will be carried out by the independent testing agency for quality control; the intention of this Testing is for determination by the Consultant of satisfactory completed work for progress payment.

.3 It is the Contractor’s responsibility to carry out whatever testing he feels is required to ensure that the work is in conformance with the Contract Documents.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Engineer at no cost to Engineer/Owner. Pay costs for retesting and reinspection.

1.5 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

.1 Notify Engineer 72 hours in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Engineer.

1.8 REPORTS

.1 Submit 3 copies of inspection and test reports to Engineer.

1.9 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 QUALITY CONTROL TESTING

.1 At a minimum the quality control testing shall achieve the following frequencies (should a particular specification within this contract document indicate a testing frequency contrary to the table below, the most stringent testing frequency shall apply):

Minimum Frequencies of Quality Control Testing		
Product	**Description**	**Minimum QC Testing Frequency**
All other Items and Work	• Per the Contract.	• Where frequencies are not specified in the Contract, as mutually agreed between the Consultant and the Contractor as necessary to ensure conformance with the specified quality requirements.

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers Temporary Utilities required in a short-term capacity for construction of the Works.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Submittals.

.4 Installation and Removal.

.5 Dewatering.

.6 Water Supply.

.7 Temporary Heating and Ventilation.

.8 Temporary Power and Light.

.9 Temporary Communication Facilities.

.10 Fire Protection

.11 Temporary Sanitary Facilities.

.12 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.5 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.6 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.7 WATER SUPPLY

.1 No potable water is available for construction use.

.2 Contractor shall be responsible for suppling all potable water required for constructing the Works.

1.8 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be flameless (vent free) type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture condensation on surfaces.

.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

1.9 TEMPORARY POWER AND LIGHT

.1 Contractor shall provide necessary power service.

.2 Contractor shall arrange with the electrical utility, as needed, for additional power requirements, including power takeoff points, voltage and phasing, transformers, and metering, and shall pay resulting costs and fees.

1.10 TEMPORARY COMMUNICATIONS FACILITY

.1 Contractor shall provide telephone service at the construction site office for Contractor’s own use. Cellular telephone service is acceptable as a substitute for land-line telephone service.

1.11 FIRE PROTECTION

.1 Contractor shall provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on Site.

1.12 TEMPORARY SANITARY FACILITIES

.1 Contractor shall provide on-site toilet and wash-up facilities for the work force that comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation.

.2 Provide sufficient sanitary facilities for workers in accordance with local health authorities.

.3 Maintain in clean condition.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers Facilities and Infrastructure required in a short-term capacity for the construction of the Works.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Submittals.

.3 Installation and Removal.

.4 Site Storage/Loading.

.5 Construction Parking.

.6 Construction Signage.

.7 Protection and Maintenance of Traffic.

.8 Clean Up.

.9 Temporary Erosion and Sedimentation Control.

.10 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 35 43 – Environmental Procedures

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.5 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.6 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.7 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.9 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within 2 weeks of signing Contract, in a location designated by Engineer.

.2 No other signs or advertisements, other than warning signs, are permitted on site.

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Engineer.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Engineer.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sediment control (ESC) plan in accordance with 01 35 43.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers traffic control measures to be employed in construction of the Works.

1.2 SECTION INCLUDES

.1 Reference Standards.

.2 Traffic Regulation.

.3 Protection of Public Traffic.

.4 Informational and Warning Devices.

.5 Control of Public Traffic.

.6 Measurement and Payment.

1.3 REFERENCE STANDARDS

.1 British Columbia Occupational Health and Safety Regulation

.1 Part 18: Traffic Control.

1.4 TRAFFIC CONTROL

.1 Confine construction traffic to designated haul routes.

.2 Provide all required traffic control permits and signage when construction operations or traffic encroach on public traffic lanes.

.3 Control construction vehicular parking to prevent interference with access by emergency vehicles, and Owner’s operations.

.4 Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.

.5 Prevent construction parking on or adjacent to access roads or in non-designated areas.

.6 Repair damage caused by installation and removal or contractor and temporary facilities.

1.5 PROTECTION OF PUBLIC TRAFFIC

.1 It will be the responsibility of the Contractor under the Contract to maintain traffic during the entire period of the Contract and to ensure that maximum protection is afforded to the road user and that the Contractor's operations in no way interfere with the safe operation of traffic.

.2 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.3 When working on travelled way:

.1 Place equipment in position to minimize interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.4 Close lanes of road only after receipt of written approval Engineer.

.1 Before re-routing traffic erect suitable signs and devices.

.5 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.

.6 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, except where other means of road access exist that meet approval of Engineer.

1.6 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning.

.3 Meet with Engineer prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Engineer.

.4 Continually maintain traffic control devices in use:

.1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Remove or cover signs which do not apply to conditions existing from day to day.

1.7 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag personnel, trained in accordance with, and properly equipped for situations as follows:

.1 Regulate traffic during normal landfill operating hours, when construction operations or related traffic encroaches on either on-site and off-site public traffic lanes including site entrance, scale house bypass lane, public tipping area, and perimeter haul road.

.2 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

.3 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.

.4 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.5 Where temporary protection is required while other traffic control devices are being erected or taken down.

.6 For emergency protection when other traffic control devices are not readily available.

.7 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.8 At each end of restricted sections where pilot cars are required.

.9 Delays to public traffic due to contractor's operators:15 minutes maximum.

.2 Where roadway, carrying two-way traffic, is restricted to one lane, for 24 hours each day, provide portable traffic signal system.

1.8 CONTROL OF PUBLIC TRAFFIC – TEMPORARY HAUL ROAD

.1 Provide competent flag personnel, trained in accordance with, and properly equipped for as follows:

.1 Regulate traffic during normal landfill operating hours, when construction operations or related traffic encroaches on-site public traffic lanes.

.2 A minimum of two flag personnel shall be deployed to address inbound and outbound public traffic.

.3 Delays to public traffic due to contractor's operators:15 minutes maximum.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers the temporary barriers and enclosures required during construction of the Works to ensure safety for construction personnel and the public, and to reduce potential time losses due to preventable incidences.

1.2 SECTION INCLUDES

.1 Installation and Removal.

.2 Guard Rails and Barricades.

.3 Security Fencing.

.4 Vehicular Access to Site.

.5 Public Traffic Flow.

.6 Fire Routes.

.7 Protection for Off-Site and Public Property.

.8 Protection of Building Finishes.

.9 Measurement and Payment.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 GUARD RAILS AND BARRICADES

.1 Contractor shall provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities from damage during construction operations.

.2 Provide as required by governing authorities and good practice, secure, rigid guard railings and barricades around deep excavations, open shafts.

.3 Signage shall be used to delineate the Work.

1.5 SECURITY FENCING

.1 Contractor shall provide and maintain temporary security fencing where chain link fence is removed to facilitate Work, and along the public tipping area to ensure public cannot access excavation areas.

.2 Contractor shall provide and maintain temporary security fencing as shown on Drawings to maintain separation between Works and public access areas.

1.6 VEHICULAR ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

.2 Existing Roads: Reasonable use of existing on-Site roads for construction traffic is permitted subject to the following conditions:

.3 Do not interrupt or interfere with traffic on roads at any time except where open trench crossings are specified on the Drawings and proper notice regarding open trench crossings has been given to Engineer.

.4 Tracked vehicles are not allowed on paved areas.

1.7 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.8 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.10 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Engineer locations and installation schedule 5 days prior to installation.

.4 Contractor shall be responsible for damage incurred due to lack of or improper protection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This Section covers general procedures and requirements for transportation, storage, handling, protection, installation and execution of common products not covered in the general detailed or manufacturer's specifications.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Quality.

.3 Availability.

.4 Product Substitution.

.5 Storage, Handling and Protection.

.6 Transportation.

.7 Manufacturer's Instruction.

.8 Quality of Work.

.9 Coordination.

.10 Concealment.

.11 Remedial Work.

.12 Location of Fixtures.

.13 Fastenings.

.14 Protection of Work in Progress.

.15 Existing Utilities.

.16 Measurement and Payment.

1.3 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Engineer based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Engineer of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Engineer at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Engineer reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 PRODUCT SUBSTITUTION

.1 Document each request with complete data substantiating compliance of proposed substitution with the Contract Documents.

.2 A request for substitution constitutes a representation that Contractor:

.1 Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

.2 Will provide the same warranty for the substitution as for the specified product.

.3 Will coordinate installation and make changes to other Works which may be required for the Works to be complete at Contractor's expense and at no additional cost to Owner.

.4 Waives claims for additional costs or time extension which may subsequently become apparent.

.5 Substitutions will not be considered when they are indicated or implied on Shop Drawings or product data submittals without separate written request.

1.6 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction Engineer.

.9 Touch-up damaged factory finished surfaces to Engineer’s satisfaction. Use touch-up materials to match original. Do not paint over name plates.

.10 Contractor shall be fully responsible for loss or damage to stored products, materials, and equipment.

1.7 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

1.8 MANUFACTURER’S INSTRUCTION

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Engineer in writing, of conflicts between specifications and manufacturer's instructions, so that Engineer will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Engineer to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Engineer if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Engineer reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Engineer, whose decision is final.

1.10 COORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Engineer.

1.13 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 Scope of work includes utility locations, establishing survey control points, and layout.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Qualifications of Surveyor.

.4 Survey Reference Point.

.5 Survey Requirements.

.6 Existing Services.

.7 Location of Equipment and Fixtures.

.8 Records.

.9 Submittals.

.10 Subsurface Conditions.

.11 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 71 13 – Mobilization and Startup.

1.4 REFERENCE STANDARDS

.1 Owner's identification of existing survey control points and property limits.

1.5 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Engineer.

1.6 SURVEY REFERENCE POINT

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Engineer.

.4 Report to Engineer when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.7 SURVEY REQUIREMENTS

.1 Setting Out:

.1 The Contractor will give the Consultant a minimum of 48 hours notice in writing before requiring any levels, lines or stakes.

.2 Before commencing Work, the Contractor shall satisfy themselves as the meaning and correctness of all stakes, markers, and grade sheets.

.3 Contractor shall cooperate by making the Work available for such checking at suitable times, as required by the Consultant. This checking does not relieve the Contractor from his responsibility for the correctness of the layout Work.

.2 The Contractor shall establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.3 Establish lines and levels, locate and lay out, by instrumentation.

.4 Stake for grading, fill, topsoil placement and landscaping features.

.5 Stake slopes and berms.

.6 Establish pipe invert elevations.

.7 Stake batter boards for foundations.

.8 Establish foundation column locations and floor elevations.

.9 Establish lines and levels for mechanical and electrical work.

.10 Verify layout with Engineer and adjust as required.

.11 Verify material lengths with Engineer prior to ordering materials for construction of the Works.

.12 The Contractor to supply and pay for all stakes, markers, tools, and any help reasonably required in driving in stakes and setting out of work.

.13 The Contractor shall have the same person available when a request for any help is made. This person shall be available from the first day of the start of construction through the Date of Substantial Performance.

1.8 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Engineer of findings.

.2 Remove abandoned service lines within 4 metres of structures. Cap or otherwise seal lines at cut-off points as directed by Engineer.

1.9 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Engineer of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Engineer.

1.10 RECORDS

.1 The Contractor shall record all changes made during construction and provide record drawings to the Engineer upon completion of the Work.

.2 Maintain a complete, accurate log of control and survey work as it progresses.

.3 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.4 Record locations of maintained, re-routed and abandoned service lines.

1.11 SUBMITTALS

.1 Submit name and address of Surveyor to Engineer.

.2 On request of Engineer, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.12 SUBSURFACE CONDITIONS

.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

.1 No separate payment will be made for work under this Section. Payment for establishing survey control points, layout, records, and survey requirements included in Payment Item 01 71 13/2.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 Contractor shall be responsible for all preparatory work and operations required prior to beginning Work.

1.2 SECTION INCLUDES

.1 Mobilization and Startup.

.2 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 29 00 – Payment Procedures

.2 Section 01 33 00 – Submittal Procedures

.3 Section 01 71 13 – Mobilization and Startup

1.4 MOBILIZATION AND STARTUP

.1 Contractor shall not mobilize to the site without the Engineer’s written authorization.

.2 Mobilization shall include, but not limited to, the following:

- .1 Performance of planning and scheduling activities necessary for the performance of the Works.
- .2 Purchase of materials and mobilize equipment, supplies, and incidentals to the Site.
- .3 Movement of personnel, tools, equipment, materials, supplies, and incidentals to the Project site and all preparatory work
- .4 Establishment of all necessary facilities, including acquisition of easements for the Contractor’s convenience.
- .5 Obtaining permits necessary for the execution of the Work.
- .6 Providing required bonds, workers' compensation board status, and proof of insurance.

.3 Startup shall include, but not limited to the following:

- .1 Establish site access and haul roads necessary to construct the Works and transport materials to and from temporary stockpile locations.
- .2 Establish Site temporary utilities and facilities in areas designated by Engineer.
- .3 Coordinate scheduling, submittals, and work of the various Sections of the Project Specifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 Payment Procedures: Requirements for measurement and payment.

4.2 MOBILIZATION AND STARTUP

.1 Mobilization

.1 Schedule of Prices Item No. 01 71 13/1.

.2 Payment Basis: Lump sum price. Includes furnishing and maintaining insurance required by the Contract Documents; mobilization; and procuring necessary permits.

.2 Startup

.1 Schedule of Prices Item No. 01 71 13/2.

.2 Payment Basis: Lump sum price. Includes establishing site access, and temporary controls, field engineering, establishing survey control points, surveying and site layout; resource and material procurement activities.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 Scope includes general execution requirements for constructing the Works and survey requirements for unit based payment items.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Submittals.

.3 Materials.

.4 Preparation.

.5 Execution.

.6 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

1.4 SUBMITTALS

.1 Submittals: In accordance with Section 01 33 00 – Submittal Procedures

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.5 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 – Submittal Procedures.

1.6 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.7 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.3 Restore work with new products in accordance with requirements of Contract Documents.

.4 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

PART 2 PRODUCTS

2.1 NITROGEN

.1 Compressed nitrogen gas with purity of 90 percent or greater.

PART 3 EXECUTION

3.1 SURVEY

.1 Reference point for elevations and lines will be provided by the Engineer. Establish all other required lines and grades from the Engineer’s reference points.

.2 Give forty-eight (48) hours’ notice of need for reference points and ensure that line for reference points has been cleared.

.3 Supply all stakes, hubs, pins templates, flagging, spray paint, poles, etc. required for the Work.

.4 Be satisfied as to the correct meaning of all reference points. Discontinue Work and advise Engineer immediately if an error is suspected in drawings, specifications, reference points, grade sheets, etc.

.5 Surveys completed for the purposes of quantity review and as built (record) drawings shall be reviewed with the Consultant.

.6 Survey of all components of the wellfield collection system and Piping Network at a spacing determined by the Consultant.

.7 Owner may confirm survey data through an independent survey.

.8 Contractor shall submit survey data to the Engineer within 24 hours of the data being collected. The Engineer shall have a minimum of two working days from the time of reception to review and approve the survey data. Approval of survey data shall be granted to the Contractor by the Engineer through the Owner.

.9 Contractor must ensure that duplicate point/shot numbers are not submitted.

.10 Survey files submitted to the Engineer shall contain only one type of data. Separate files must be created and submitted for different types of data, i.e., Original ground, topsoil stripping, and subsoil stripping shall be submitted in three different files.

.11 Survey file names shall contain the date of data collection and a description of the data collected. Points contained within the survey file shall bear descriptions that clearly indicate the data they represent. Point names and file names should be very similar in nature. For example, topsoil stripping data collected on June 2, 2019 shall be submitted in a file named “June 2, 2019 – Topsoil Stripping”, and the points contained within the file shall be named “Topsoil Stripping”.

.12 Only newly collected survey data shall be submitted. Previously submitted data shall not be included with new data.

.13 Correct geosynthetic and earthwork terminologies, consistent with the contract documents, shall be used in descriptions of survey data pertaining to these items.

.14 The following list presents the deliverables for the survey from the Contractor to the Engineer:

Item No.	Survey Submittals	Submittal Requirement	% of Line Item
1	Initial Site Layout	Layout of Works to be constructed prior to commencement of construction. Layout to be approved by Consultant.	40%
2	Adjusted Site Layout	Re-survey extraction well and pipe alignments adjusted by Consultant.	10%
3	Vertical Extraction Wells	Survey grade elevation of all vertical extractions wells (both new and retrofitted well installations) upon completion of regrading restorations works.	20%
4	Pipe Works	Survey pipe inverts for all pipe works prior to backfiling.	30%

Item No.	Survey Submittals	Submittal Requirement	% of Line Item
5	Final As-Built ground topography of entire work area post ALL Work, including any disturbed areas outside of the designated work area. This item will also include any item requested by the Engineer throughout the duration of the contract that is not specifically listed above.	Survey must be submitted and approved prior to payment of Demobilization	Included in Payment Item 01 77 00/1

3.2 NITROGEN PURGING – WELL FIELD

.1 Notify Consultant five (5) working days prior to commencing nitrogen purging of well field.

.2 Contractor to supply nitrogen, regulator, hoses, connections, and labour to undertake nitrogen purging of all existing well field pipe works prior to commencement of excavation related activities, existing extraction well retrofit, and connection to existing pipe works.

.3 Consultant and Owner to coordinate and assist contractor with purging activities, including determining purge points and the monitoring of gas composition.

.4 Coordinate isolate all Control Plant valves with Consultant and Owner prior to commencing nitrogen purge.

.5 The Contractor will purge the existing well field pipe works with two volumes of nitrogen (1,000 litres at standard atmospheric conditions) until the methane concentration in the pipe works is less than 0.5 percent (volumetric basis) or 10 percent of the lower explosive limit.

.6 Nitrogen shall be added to the landfill gas piping through the isolation valve sample ports at a pressure not to exceed the 20 kPA and flow rate adequate to reduce mixing with air.

3.3 CLEAN UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 Payment Procedures: Requirements for measurement and payment.

4.2 SURVEYING

.1 Schedule of Prices Item No. 01 73 00/1.

.2 Payment Basis: Lump sum price. Includes furnishing and maintaining insurance required by the Contract Documents; mobilization; and procuring necessary permits.

4.3 NITROGEN PURGING – WELL FIELD

.1 Schedule of Prices Item No. 01 73 00/2.

.2 Payment Basis: Lump sum price. Includes supply of nitrogen, equipment and labour to undertaken well field nitrogen purging activities.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 Scope includes final closeout and submittal requirements including final cleaning and surveying, and warranties.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Administrative Requirements.

.3 Final Cleaning.

.4 Submittals.

.5 Format.

.6 Contents – Project Record Documents.

.7 As-Built Documents.

.8 Recording Information on Project Record Documents.

.9 Final Survey.

.10 Warranties and Bonds.

.11 Equipment and Systems.

.12 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittals

.2 Section 01 29 00 – Payment Procedures

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Engineer in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Engineer’s inspection.

.2 Engineer’s Inspection:

.1 Engineer and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested, balanced, adjusted and fully operational.

.4 Certificates required by regulatory authorities submitted.

.5 Operation of systems: demonstrated to Owner's personnel.

.6 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Engineer, and Contractor.

.2 When Work incomplete according to Engineer, complete outstanding items and request re-inspection.

1.5 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Waste Management: separate waste materials for recycling and/or reuse.

.4 Remove waste materials and debris from site at regularly scheduled times or dispose of as directed by Engineer. Do not burn waste materials on site.

.5 When the Work is Substantially Performed, remove surplus products, tools construction machinery and equipment not required for performance of remaining Work.

.6 Clean debris from drainage and storm water management systems.

.7 Repair pavement, roads, sod, and all other areas affected by construction operations and restore them to original condition or to minimum condition specified.

.8 Prior to final review remove surplus products, tools, construction machinery and equipment.

.9 Remove waste materials from site at regularly scheduled times or dispose of as directed by Engineer. Do not burn waste materials on site.

.10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.11 Sweep paved areas, and rake clean landscaped surfaces.

.12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.13 Remove dirt and other disfiguration from exterior surfaces.

.14 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.15 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

1.6 ACCESS ROAD AND DRILL PAD DECOMMISSIONING

.1 When Work is Substantially Performed, blade and repair landfill cover system, access roads, sod, and all other areas affected by construction activities and restore them to original condition.

.2 Remove dirt and other disfiguration from exterior surfaces.

1.7 SUBMITTALS

.1 Provide closeout submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.8 FORMAT

.1 Provide final survey data on USB hard drive.

1.9 CONTENTS – PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

1.10 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of drawings provided by Engineer.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 Referenced Standards to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain field test records, inspection certifications and manufacturer's certifications required by individual specifications sections.

.7 Provide digital photos, if requested, for site records.

1.11 FINAL SURVEY

.1 Field survey data, including all installed works. Pipe installations shall be surveyed, prior to backfilling, at a minimum of one survey point every 10 metres, including all pipe junctions, tees, valves, and connections.

1.12 WARRANTIES AND BONDS

.1 Provide Warranties and Bonds fully executed and notarized.

.2 Execute transition of Performance and Labour and Materials Payment Bond to Warranty Period requirements.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures: Requirements for measurement and payment.

4.2 DEMOBILIZATION AND CLOSEOUT

.1 Schedule of Prices Item No. 01 77 00/1.

.2 Payment Basis: Lump sum price. Includes final cleaning of equipment, construction facilities, and materials to be removed from the Site; removal of temporary construction and support facilities provided by Contractor; final Site cleanup, access road and drill pad decommissioning, final grading, adjusting, field surveying of final works, restoration, record documents, warranties and bonds.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

.1 The Contractor shall furnish all labour, materials, tools, supervision, transportation, and equipment necessary to install well field and buried control plant HDPE pipe, accessories, appurtenances and connections as shown on the Drawings and specified herein.

1.2 SECTION INCLUDES

.1 Subheader Pipe.

.2 Lateral Pipe.

.3 Hydrostatic Pressure Testing.

.4 Warning Tape.

.5 Tracer Wire.

.6 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 31 23 10 – Excavating and Trenching

.2 Section 31 23 33.02 – Fill

1.4 REFERENCE STANDARDS

.1 Section 01 42 19 – Reference Standards.

.2 American Society for Testing and Materials (ASTM):

- .1 ASTM A536 – Standard Specification for Ductile Iron Castings.
- .2 ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
- .3 ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- .4 ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- .5 ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- .6 ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- .7 ASTM D4976-00b – Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
- .8 ASTM D3350-00 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

.9 ASTM F405 – Standard Specification for Corrugated Polyethylene Tubing and Fittings.

.10 ASTM F667 – Standard Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings.

.11 ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDRPR) Based on Outside Diameter.

.12 ASTM F2306 – Standard Specification for 12 to 60 in. (300 to 1500 mm) Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.

.3 American National Standards Institute (ANSI):

.1 ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

.2 ANSI B18.2.1 – Square and Hex Bolts, and Lag Screws (Inch Series)

.4 Canadian Standards Association (CSA):

.1 CSA B1373.3 – Rigid Polyvinyl Chloride Pipe.

.2 CSA B182.8-02 – Profile Polyethylene Storm Sewer and Drainage Pipe and Fittings.

.3 CSA G401 – Corrugated Steel Pipe Products.

1.5 DEFINITIONS

.1 CSP: Corrugated Steel Pipe

.2 HDPE: High Density Polyethylene

.3 LFG: Landfill Gas

.4 SMDD: Standard Maximum Dry Density and in the context of this Contract means maximum dry unit weight determined in accordance with ASTM D698

.5 DR: Dimension Ratio. Actual outside pipe diameter divided by the wall thickness

1.6 PROGRESS SUBMITTALS

.1 Submit in accordance to Section 01 33 00 – Submittal Procedures.

.2 Product Data: Piping and fitting dimensions including test reports and material property sheets.

.3 Manufacturer's Certificate: Quality control certificates pertaining to each lot of pipe produced.

.4 Manufacturer's Instructions: Indicate special procedures required to install products specified.

1.7 QUALITY ASSURANCE

.1 HDPE Pipe

.1 Pipe Resin: ASTM D1248 for material indicating a Type 3, Category 5, Class C, Grade P4710 (ASTM D3350 Cell Classification 3453C).

.2 Raw Material: Containing a minimum 2 percent carbon black, well dispersed by recompounding to protect the pipe from degradation by ultraviolet light.

.3 Pipe shall not contain any recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the same raw material supplier.

.4 Pipe Sizes: ASTM F714. Pipe sizes are specified in metric units; however, equivalent IPS pipe sizes shall be used to avoid fitting problems.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Section 01 61 00 – Common Product Requirements: Product delivery, storage, and handling requirements.

.2 Deliver and store piping with labeling in place.

.3 Deliver, store, and handle pipe in accordance with applicable requirements of the specified references, the manufacturer's instructions, and as specified herein.

.4 Contractor is responsible for conducting an inspection at the time of delivery to verify that the correct products and the expected quantities are received. Pipes and accessories should be visually inspected for damage such as cuts, gouges, delamination, bulges, flat areas and ovality that may have occurred during shipment.

.5 Use every precaution to prevent damage to the pipe. Do not permit metal tools or heavy objects to unnecessarily come in contact with the pipe.

.6 All pipe shall be lifted off trailer such that any damage while unloading is avoided.

.7 Contractor is responsible for each pipe shipment to ensure that there has been no loss or damage.

.8 Pipe shall be stored on level surfaces to avoid deformation. Supports shall be spaced to prevent bending and deformation to the ends of the pipe. When stacked, the weight of upper units shall not cause deformation to pipe in the lower units.

PART 2 PRODUCTS

2.1 SUBHEADER PIPE

.1 HDPE Pipe: DR 17, 150 mm diameter.

.2 Bedding Sand: See Section 31 23 33.02 – Fill.

.3 Accessories:

.1 Joints: Thermal butt fusion except flanged and electrofusion connections.

.2 Flanges: ASTM A536 ductile iron backing flanges with Class 150 ANSI B 16.5 standard drilling and corrosion resistant coatings. Complete with 1-piece molded polyethylene stub ends and stainless steel bolt sets, unless otherwise indicated on drawings. Connections shall have same or greater pressure rating as pipes.

.3 Gaskets: Neoprene, minimum 3.2 mm thick.

.4 Bolt Sets: Hexagonal type 304 Stainless steel unless otherwise indicated in Drawings.

.5 Fittings: DR 17 Tee connections, Wye connections, and reducers.

.6 Electrofusion Couplers: DR 11.

.7 Blind Flanges: SCH 80 PVC.

.8 Warning Tape: See Article 2.11.

.9 Tracer Wire: See Article 2.12.

2.2 LATERAL PIPE

.1 HDPE Pipe: DR 17, 100 mm diameter.

.2 Bedding Sand: See Section 31 23 33.02 – Fill.

.3 Accessories:

.1 Joints: Thermal butt fusion except flanged connections.

.2 Flanges: ASTM A536 ductile iron backing flanges with Class 150 ANSI B 16.5 standard drilling and corrosion resistant coatings. Complete with 1-piece molded polyethylene stub ends and stainless steel bolt sets, unless otherwise indicated on drawings. Connections shall have same or greater pressure rating as pipes.

.3 Gaskets: Neoprene, minimum 3.2 mm thick.

.4 Bolt Sets: Hexagonal type, 304 Stainless steel unless otherwise indicated in Drawings.

.5 Fittings: DR 17 Tee connections, Wye connections and reducers.

.6 Long Sweep Elbow: DR 17 90 degrees, 5 section elbow.

.7 Warning Tape: See Article 2.11.

.8 Tracer Wire: See Article 2.12.

2.3 WARNING TAPE

.1 Standard, 4-mil polyethylene 76 mm (3 inch) wide tape, detectable type, blue with black letters, and imprinted with “BURIED GAS LINE BELOW”. Tape shall be installed as shown on Drawings.

2.4 TRACER WIRE

.1 TWU No. 12 Gauge Solid Copper Wire: 3.2 mm diameter.

.2 Minimum Roll Length: 300 m.

.3 Wire Connectors: 3M DBR watertight connectors for No. 12 gauge wire or approved equivalent.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Section 01 73 00 – Execution: Verification of existing conditions before starting work.

.2 Verify that excavation foundation is ready to receive work and excavations, dimensions, and elevations are as shown on the Drawings.

.3 Verify items provided by other Sections are properly sized and located.

3.2 PREPARATION

.1 Excavate to grades as shown on drawings, as per Section 31 23 10.

.2 Pipe shall be inspected for cuts, scratches, or other damages prior to installation. Any pipe showing damage which in the opinion of the Engineer will affect the performance of the pipe must be removed from the site. Replace any materials found to be defective.

.3 Hand trim excavations to required elevations.

.4 Ensure that the excavation remains dry and groundwater elevation remains below the base excavation elevation until adequate backfill is placed to ensure that the installed pipe will not be dislodged.

.5 Ensure that excavation foundation is suitable for pipe bedding placement. Excavation foundation should be free of large stones, clumps of soil, frozen soil and debris.

.6 Trench width shall be sufficiently wide to allow compaction of pipe bedding in the haunches and adjacent to the sides of the pipe.

.7 Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

.8 Unsuitable materials and waste excavated from trench alignments shall be disposed of on-site as directed by Engineer.

3.3 PIPE INSTALLATION

.1 Prevent debris and water from entering inside of pipe.

.2 Do not bend in a radius smaller than recommended by Manufacturer when staged on Site or installed in the trench.

.3 Perform thermal fusion in sheltered areas with temperature maintained in accordance with Manufacturer’s instructions.

.4 Avoid excess transportation and possible damage to the pipe.

.5 Prior to thermal fusion in the field on any pipe on a given date, provide a test weld and operating data to Engineer including welding temperature, machine number, date of last service, and clearance certificate.

.6 Install pipe, fittings, and accessories in accordance with Manufacturer’s instructions.

.7 Lay pipe to slope gradients as shown on Drawings with maximum variation from true slope of 1 cm in 3 m. Maintain positive drainage for all pipe sections.

.8 Use laser equipment for controlling grade of pipe installation.

.9 Fasten tracer wire to pipe and risers.

.10 Backfill to lines and grades indicated on Drawings.

.11 Place buried pipe tape as shown on Drawings.

.12 The Contractor shall stockpile all excavated materials not used for backfilling or cover soil on site as directed by Engineer.

.13 Soil used for backfill shall be placed in a loose lift that results in a compacted lift thickness of no greater than 150 mm (6 inches). The maximum permissible pre-compaction soil clod size is 150 mm.

.14 Surplus waste excavated from trenches shall be hauled to the landfill active area.

3.4 THERMAL WELDING PIPE

.1 All pipe fusion shall be performed by a supplier or a factory supplied and/or certified fusion operator.

.2 Join the polyethylene pipe by the method of thermal butt fusion, outlined in ASTM D 2657, or saddle fusion, depending on the type of joint. Of particular importance is the use of proper interface pressures and heater plate temperatures.

.3 Pipe cuts shall be square and perpendicular to the centerline of the pipe for butt fusion joints.

.4 Do not perform pipe fusion in water or when trench conditions are unsuitable for the work. Keep water out of the trench until joining is complete. Secure open ends of pipe and close valves when work is not in progress, so that no trench water, earth, or other substance will enter the pipe or fittings. Plug, cap or valve pipe ends left for future connection.

.5 In order to allow the joining operation to continue in adverse weather conditions, a shelter may be required for the joining machine. Particular caution should be exercised to prevent water from entering the pipe and from coming in contact with the heater plate and electrical connections. All electric lines used in field operations shall be fitted with ground fault current interrupters (GFCI).

.6 Only fully-trained personnel will be allowed to perform the installation, supervision, or inspection of polyethylene-fusion joints.

3.5 FIELD QUALITY CONTROL

.1 Section 01 45 00 – Quality Control: Field inspection and testing.

.2 Request inspection prior to placing aggregate cover over pipe.

.3 Compaction testing will be performed in accordance with Section 31 23 33.02 – Fill.

.4 Hydrostatic Pressure and Leakage Test for header, sub-header, lateral pipes, genset connection and flare condensate line. Test as follows:

.1 Provide labor, equipment, and materials required to perform hydrostatic and leakage tests herein specified; notify Engineer at least 24 hours in advance of all proposed tests; perform tests in the presence of Engineer.

.2 Test at one time as much of the piping system as practical and authorized by Engineer.

.3 Test all well field pipework at a pressure rating of 30 kPa. Utilize air or nitrogen to charge the pipelines and maintain pressure for adequate period to allow for expansion of the piping. Fittings, valves, and expansion joints shall be accessible for inspection during the pressure test. A pressure test will be deemed successful if the designated pressure is maintained for a period of not less than 1 hour with no

measurable pressure drop during the term of the test. The temperature must be constant to within 1 degree C during this period or adjusted with the appropriate correction factor.

.4 Cap and seal testing ports at the termination of the pressure test.

.5 Examine joints for leakage and remove any joints showing leakage from the pipeline, rejoin and retest the system.

.6 Ensure that normal safety precautions are observed for exposed piping.

.7 Locate and repair defects if leakage occurs.

.8 Repeat test until pressure drop is within specified allowance for full length of pipe.

.5 If tests indicate that the Works do not meet specified requirements, remove Works, replace, and retest.

3.6 PROTECTION OF FINISHED WORKS

.1 Section 01 73 00 – Execution: Requirements for protecting installed work.

.2 Protect pipe and cover from damage or displacement prior to and during backfilling operations.

.3 Prevent debris from entering system.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures: Requirements for measurement and payment.

4.2 SUBHEADER PIPE

.1 Schedule of Prices Item No. 23 05 05/01.

.2 Measurement Basis: By the linear metre measured along the centerline of the pipe.

.3 Payment Basis: Unit price. Incudes excavation, transporting suitable materials to temporary stockpiles, temporary stockpiling, and hauling and disposal of waste, unsuitable material or excess excavated materials at the active landfill area; supply and install bedding sand, sub-header pipe, fittings and accessories, flanges, gaskets, bolt sets, warning tape, and tracer wire; hauling, placing, compacting of backfill, regrading to grades as shown in Drawings.

4.3 LATERAL PIPE

.1 Schedule of Prices Item No. 23 05 05/02.

.2 Measurement Basis: By the linear metre measured along the centerline of the pipe.

.3 Payment Basis: Unit price. Incudes excavation, transporting suitable materials to temporary stockpiles, temporary stockpiling, and hauling and disposal of waste, unsuitable material or excess excavated materials at the active landfill area; supply and install bedding sand, lateral pipe, long sweep elbows, fittings and accessories, flanges, gaskets, bolt sets, warning tape,

and tracer wire; hauling, placing, compacting of backfill, regrading to grades as shown in Drawings.

4.4 HYDROSTATIC PRESSURE TESTING

.1 Schedule of Prices Item No. 23 05 05/03.

.2 Payment Basis: Lump Sum Price. Includes supply of equipment, materials and labour to undertake hydrostatic pressure testing of all well field pipeworks.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

.1 The Contractor shall furnish all labour, materials, tools, supervision, transportation, and equipment necessary to install new well field isolation valves and modify existing well field isolation valves as shown on Drawings.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Definitions.

.4 Progress Submittals.

.5 Delivery, Storage and Handling.

.6 150 mm Subheader Isolation Valve and Sample Port.

.7 150 mm Horizontal Trench Isolation Valve and Sample Port.

.8 Execution.

.9 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 23 05 05 – Well Field Pipework.

.2 Section 31 23 33.02 – Fill.

1.4 REFERENCE STANDARDS

.1 Section 01 42 19 – Reference Standards.

.2 American Society of Mechanical Engineers (ASME):

.1 ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard

.2 ASME B18.2 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).

.3 American Society for Testing and Materials (ASTM):

.1 ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.

.2 ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

.3 ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.

.4 ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

.5 ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

.6 ASTM D4976-00b – Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.

.7 ASTM D3350-00 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

.8 ASTM F405 – Standard Specification for Corrugated Polyethylene Tubing and Fittings.

.9 ASTM F667 – Standard Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings.

.10 ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe SDRPR) Based on Outside Diameter.

.11 ASTM F2306 – Standard Specification for 12 to 60 in. (300 to 1500 mm) Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.

.4 American National Standards Institute (ANSI):

.1 ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

.2 ANSI B18.2.1 – Square and Hex Bolts, and Lag Screws (Inch Series)

.5 Canadian Standards Association (CSA):

.1 CSA B1373.3 – Rigid Polyvinyl Chloride Pipe.

.2 CSA B182.8-02 – Profile Polyethylene Storm Sewer and Drainage Pipe and Fittings.

1.5 DEFINITIONS

.1 HDPE: High Density Polyethylene.

.2 PE: Polyethylene.

.3 PVC: Polyvinyl Chloride.

1.6 PROGRESS SUBMITTALS

.1 Section 01 33 00 – Submittal Procedures.

.2 Product Data: Specifications and dimensions including test reports and material property sheets.

.3 Manufacturer's Instructions: Indicate special procedures required to install products specified.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Section 01 61 00 – Common Product Requirements.

.2 Deliver and store products with labeling in place.

.3 Deliver, store, and handle pre-cast concrete with applicable requirements of the specified references, the Manufacturer's instructions, and as specified herein.

.4 Use every precaution not to damage products.

PART 2 PRODUCTS

2.1 150 MM SUBHEADER ISOLATION VALVE AND SAMPLE PORT

.1 Manufacturer: Chemline, PVC HC manual ball valve or approved equivalent.

.2 Diameter: 150 mm.

.3 Process Fluid: Landfill Gas.

.4 Body: PVC.

.5 Ends: Flanged, AMSE B16.5.

.6 Body and Stem Seal: Viton.

.7 O-Ring: Viton.

.8 Seat: Viton.

.9 Accessories:

- .1 Municipal Operating Nut.
- .2 Bolt Set: ASME B 18.2.1, 316 stainless steel unless otherwise indicated on Drawings. Project bolt ends 6 millimeters beyond surface of nuts.
- .3 Gasket: Neoprene, minimum 3.17 millimeters thick, full faced.
- .4 Riser: 150 mm diameter SCH 80 PVC riser.
- .5 Cap: Royer aluminium locking well cap or approved equivalent.

.10 Isolation valve sample ports: Article 2.4.

2.2 150 MM HORIZONTAL TRENCH ISOLATION VALVE AND SAMPLE PORT

.1 Manufacturer: Chemline, PVC HC manual ball valve or approved equivalent.

.2 Diameter: 150 mm.

.3 Process Fluid: Landfill Gas.

.4 Body: PVC.

.5 Ends: Flanged, AMSE B16.5.

.6 Body and Stem Seal: Viton.

.7 O-Ring: Viton.

.8 Seat: Viton.

.9 Accessories:

.1 Municipal Operating Nut.

.2 Bolt Set: ASME B 18.2.1, 316 stainless steel unless otherwise indicated on Drawings. Project bolt ends 6 millimeters beyond surface of nuts.

.3 Gasket: Neoprene, minimum 3.17 millimeters thick, full faced.

.4 Riser: 150 mm diameter SCH 80 PVC riser.

.5 Cap: Royer aluminium locking well cap or approved equivalent.

.6 Electrofusion Coupler: 150 mm diameter DR 11.

.10 Isolation valve sample port: Article 2.4.

2.3 ISOLATION VALVE SAMPLE PORT

.1 Valve: Chemline, 12 mm diameter PVC compact ball valve, Teflon seat, female threads both ends.

.2 Sample fitting: 12 mm diameter stainless steel male NPT to 6 mm diameter hose barb end, Swagelok or approved equivalent.

.3 Tube compression fittings: 12 mm diameter stainless steel male NPT to 12 mm diameter tubing, Swagelok compression tubing fitting male connector or approved equivalent. Quantity: 2 per sample port assembly.

.4 Tubing: 12 mm diameter flexible Polyethylene tubing.

.5 Riser: 150 mm diameter SCH 80 PVC Riser.

.6 Cap: Royer aluminium locking well cap or approved equivalent.

.7 Bedding Sand: Refer to Section 31 23 33.02 – Fill.

.8 Quantity: 2 per location.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Section 01 73 00 – Execution.

.2 Verify that excavated and prepare area is ready to receive work, and dimensions and elevations are as shown on Drawings.

3.2 INSTALLATION OF SUB-HEADER ISOLATION VALVES AND SAMPLE PORTS

.1 Confirm location and orientation of isolation valves and sample ports with Engineer prior to commencement of work.

.2 Install valve and sample port as indicated in Drawings.

.3 Conduct pressure testing prior to backfilling.

3.3 INSTALLATION OF HORIZONTAL TRENCH ISOLATION VALVES AND SAMPLE PORTS

.1 Confirm location and orientation of isolation valves and samples ports with Engineer prior to commencement of work.

.2 Disconnect, remove and salvage existing horizontal trench at locations as indicated on Drawings.

.3 Install valve and sample port as indicated in Drawings.

.4 Install electrofusion coupler per Manufacturer's specifications.

.5 Conduct pressure testing prior to backfilling.

3.4 CLEANING

.1 If required, clean exposed work face by washing and brushing only. Use potable water, if required, as cleaner to remove debris from valve assembly prior to placing the PVC riser pipe and backfilling. Remove immediately materials that may set up or harden.

3.5 FIELD QUALITY CONTROL

.1 Section 01 45 00 – Quality Control.

3.6 PROTECTION OF FINISHED WORK

.1 Section 01 73 00 – Execution: Requirements for protection of installed work.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures: Requirements for measurement and payment.

4.2 150 MM SUBHEADER ISOLATION VALVE AND SAMPLE PORT

.1 Schedule of Prices Item No. 23 05 06/01

.2 Measurement Basis: Per valve and sample port installation.

.3 Payment Basis: Unit Price. Includes excavation, transporting suitable materials to temporary stockpiles, temporary stockpiling, hauling and disposal of waste and unsuitable or excess excavated materials in active landfill area; supply and install valve, fittings, accessories and sample ports, bedding sand and fill, connection to piping, hauling, placing, compacting of fill, backfilling and compacting cover material, and regrading to grades as shown on Drawings.

4.3 150 MM HORIZONTAL TRENCH ISOLATION VALVE AND SAMPLE PORT

.1 Schedule of Prices Item No. 23 05 06/02

.2 Measurement Basis: Per valve and sample port installation.

.3 Payment Basis: Unit Price. Includes excavation, transporting suitable materials to temporary stockpiles, temporary stockpiling, hauling and disposal of waste and unsuitable or excess excavated materials in active landfill area; supply and install valve, fittings, accessories and sample ports, bedding sand and fill, connection to piping, hauling, placing, compacting of fill, backfilling and compacting cover material, and regrading to grades as shown on Drawings.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

.1 This section covers the requirements for excavation and trenching related activities required to install the Works as shown on the Drawings.

.2 All excavation, backfilling, and compacting to be completed as specified herein and as needed for a complete and proper installation of all works.

1.2 SECTION INCLUDES

.1 Related Requirements.

.2 Reference Standards.

.3 Definitions.

.4 Progress Submittals.

.5 Environmental Requirements.

.6 Sequencing and Scheduling.

.7 Execution.

.8 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 23 05 05 – Well Field Pipework.

.2 Section 31 23 33.02 – Fill.

1.4 REFERENCE STANDARDS

.1 Section 01 42 19 – Reference Standards.

.2 American Society of Testing and Materials (ASTM):

.1 ASTM D698: Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft lbf/ft3 (600 kN m/m3)).

.2 ASTM D1556: Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

.3 ASTM D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft lbf/ft3 (2,700 kN m/m3)).

.4 ASTM D2216: Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

.5 ASTM D6938: Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

.6 ASTM D3740: Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

.7 ASTM D4253: Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

.8 ASTM D4318: Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.5 DEFINITIONS

.1 Common excavation – Excavation of materials of whatever nature, which are not included under definitions of solid rock, including dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.

.2 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.3 Waste material – Material unsuitable for use in work including solid waste materials or surplus to requirements.

.4 Subgrade – Original ground surface or prepared surface upon which clay liner or embankments are constructed.

.5 Embankment – Selected material derived from useable excavation and placed above original ground or prepared subgrade to the requirements for density and moisture required by these Specifications.

.6 Excavation: Removal of materials of whatever nature encountered, whether wet, frozen, or otherwise, including dense tills, hardpan, frozen materials, cemented materials, concrete fragments, asphalt pavement, boulders or rock fragments less than 1 cubic metres in volume, and weathered rock which can be removed by ripping or excavating with heavy duty mechanical construction equipment without drilling and blasting.

.7 Excavation Limits: Areal excavation limits shown on the Drawings to specified depth or as directed by Engineer and does not include areas shown as being on hold pending further sampling and analysis by Engineer.

.8 Additional Excavation: Excavation beyond initial excavation limits either horizontally or in depth, as directed by Engineer following sampling and analysis.

.9 SMDD: Standard Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined in accordance with ASTM D698.

1.6 PROGRESS SUBMITTALS

.1 Refer to Section 01 33 00 – Submittal Procedures.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Section 01 35 43 – Environmental Procedures.

1.8 SEQUENCING AND SCHEDULING

.1 Section 01 33 00 – Submittal Procedures: Requirements for coordination.

.2 Do not commence excavation operations until the Site-specific Health and Safety Plan has been reviewed and accepted by Engineer.

.3 Coordinate and sequence excavation operations to minimize the need for temporary stockpiling of excavated materials until required for backfilling. Make reasonable effort to balance cut and fill operations and to ensure that excavated material designated for backfill is immediately placed as backfill in the Works. Keep the time during which excavations remain open to a minimum.

.4 Excavations shall not be left open over night unless approved by Engineer.

.5 Do not allow or cause any of the work performed to be covered up or enclosed prior to required inspections, survey, tests, or approvals.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

.1 Section 01 73 00 – Execution: Verification of existing conditions before starting work.

.2 Verify that survey bench marks and existing and intended elevations for the Works are as shown on the Drawings.

.3 Undertake pre-excavation and post-excavation survey of all unit price material quantities including bedrock excavation.

.4 Monitoring Wells Requiring Protection: Engineer will locate and mark locations prior to commencement of excavation.

.5 Determine excavation depths and soil types required for shoring design. Expediently carry out investigation to prevent delay to the schedule and with sufficient detail in order to complete the design.

3.2 PREPARATION

.1 Identify required lines, levels, contours, and datum locations.

.2 Locate, identify, and protect utilities from damage.

.3 Arrange for utility company to identify utilities.

.4 Maintain and protect from damage wells, utilities, buildings, building foundations, surface features, and structures encountered, and not designated for demolition or removal. In the event of disturbance of or damage to any such well, utility, buildings, building foundations, surface features, or structures, immediately notify Engineer. Repair or replace, as directed by Engineer, any well, utility, building, building foundation, surface feature, or structure damaged by Contractor operations unless specified for demolition or removal.

.5 Protect existing buildings, wells, facilities, surface features, tanks, and structures where temporary unbalanced earth pressures or uplift are liable to develop utilizing bracing, shoring, or other approved methods to counteract unbalance.

.6 Employ procedures for excavation such that disturbance of wells, utilities, buildings, building foundations, surface features, and structures is avoided.

.7 Protect excavations from contamination.

.8 Obtain direction from Engineer before moving or otherwise disturbing wells, utilities, building, building foundations, surface features, and structures.

.9 Remove surface features or obstructions including, but not necessarily limited to, trees, shrubs, bush, and other vegetation from surfaces to be excavated, within the limits shown on the Drawings or as required to construct the finished work. Dispose of such obstructions to an on-site spoil area as directed by Engineer.

3.3 EXCAVATING - GENERAL

.1 Excavations shall not be left open overnight unless approved by Engineer.

.2 Excavate to lines, grades, elevations, and dimensions shown on the Drawings or as directed by Engineer.

.3 Slope banks with machine to angle of repose or shallower, as required by Laws and Regulations.

.4 Grade top perimeter of excavation to prevent surface water from draining into excavation.

.5 Remove debris and other obstructions encountered.

.6 Loose rock, rock fragments, earth and debris shall be removed and the surface shall be cleaned by mechanical and/or manual means such that structures bear on sound subgrade.

.7 Remove boulders and fragments that may slide or roll into excavated areas.

.8 Trim, shape and level the trench bottom so to be free of irregularities. Provide recesses for pipe joints to ensure bearing will occur along barrel of pipe.

.9 Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

.10 Hand trim, make firm, and remove loose material and debris from excavations. Where natural or fill material at bottom of excavation is disturbed, compact disturbed soil to density

at least equal to undisturbed soil or to the density specified for the succeeding layer of backfill, whichever is greater, or remove disturbed soil and refill the space as directed by Engineer.

.11 Do not disturb soil within the branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.

.12 Open excavations shall be Contractor's sole responsibility.

.13 Stockpile excavated material in area designated on the Site in accordance with Article 3.6.

3.4 DISPOSAL OF UNSUITABLE OR EXCESS EXCAVATED MATERIAL

.1 Unsuitable Excavated Materials: Soil containing rocks larger than 300 mm measured through any axis, roots, organic matter, very soft clays, fine uniform sands, soils which are not compactable to the specified density, and waste.

.2 Dispose of excavated material determined by Engineer as unsuitable for backfill or excess excavated material, in a designated on-site spoil area as directed by Engineer.

3.5 OVER EXCAVATING

.1 Notify Engineer when soil at the bottom of the excavation appears unsuitable and proceed as directed by Engineer. Where, in Engineer's opinion, the undisturbed condition of the soils is inadequate for the support of installations, over excavate to adequate supporting soils as directed by Engineer and refill the excavated space with approved material to the proper elevation in accordance with the procedure specified for backfill. Where so directed by Engineer and except as otherwise specified, the excavation and removal of inadequate material as specified, supply and installation of such material in excess of quantities shown on the Drawings will be paid for under the appropriate item of the Schedule of Additional Unit Prices. Use such over excavated material in the Works or stockpile on the Site as approved by Engineer.

.2 Backfill in accordance with Section 31 23 33.02 – Fill.

.3 Should unauthorized excavation be carried below the lines and grades shown on the Drawings and in excess of specified limits and tolerance because of Contractor's operations including errors, methods of construction, or to suit his convenience, correct unauthorized excavation as follows:

.1 Fill unauthorized over excavation areas by extending the indicated bottom elevation of the base of the material specified to be placed to the unauthorized excavation bottom without altering the required top elevation and compact in accordance with Section 31 23 33.02 unless otherwise directed by Engineer.

.4 Additional excavation to remove weakened or disturbed soil or any additional activity caused by Contractor's error, unsuitable construction methods or procedures, or to suit Contractor's convenience and subsequent additional backfill and compaction to correct deficiencies shall be at no additional cost to Owner.

3.6 TEMPORARY STOCKPILING

.1 Stockpile excavated materials on the Site at locations designated by Engineer.

.2 Construct stockpile sites so that they are well drained, free of foreign materials, and of adequate bearing capacity to support the weight of materials to be placed thereon.

.3 Provide and maintain access to stockpiles.

.4 Separate differing materials with substantial dividers or stockpile apart to prevent mixing.

.5 Prevent contamination or segregation of soil types.

.6 Direct surface water away from stockpile sites to prevent erosion or deterioration of materials.

.7 Stockpiling of excavated materials must be located so that the toe of the stockpile is located at a location defined by a 1H:1V slope line extended from the bottom of the excavation trench or 3 m from top of excavation slope, whichever is more.

.8 Maintain area surrounding stockpiles in neat and tidy condition.

.9 Cover stockpiled material with robust tarpaulin to withstand adverse weather, wind, and other detrimental forces. Provide total protection of stockpiled material from rain and other adverse weather effects.

3.7 TOLERANCES

.1 Excavation Depth: Within 50 mm or less than specified depth but not uniformly greater or less.

.2 Trench Depth: Within 25 mm greater or less than specified depth but not uniformly greater or less.

.3 Trench Width: Within 100 mm greater or less than specified width but not uniformly greater or less.

3.8 FIELD QUALITY CONTROL

.1 Section 01 45 00 – Quality Control.

.2 Engineer will provide for visual inspection of bearing surfaces.

3.9 CLEANING

.1 Section 01 73 00 – Execution: Requirements for cleaning installed work.

.2 Clean and reinstate work areas and areas affected by equipment outside areas specified to be excavated.

3.10 PROTECTION OF FINISHED WORK

.1 Section 01 73 00 – Execution: Requirements for protecting installed work.

.2 Protect bottom of excavations and soil adjacent to and beneath foundation from freezing and disturbance.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures: Requirements for measurement and payment.

4.2 OVER EXCAVATION

.1 Schedule of Additional Prices Item No. 31 23 10/01.

.2 Measurement Basis: By the cubic metre measured in place.

.3 Payment Basis: Unit price. Includes, transporting suitable materials to temporary stockpiles, temporary stockpiling, and disposal of unsuitable or excess excavated material.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Materials – General.

.2 Native Backfill.

.3 Fill.

.4 Granular Base Course.

.5 Subbase Course.

.6 Drain Rock.

.7 Pea Gravel.

.8 Bedding Sand.

.9 Compaction.

.10 Measurement and Payment.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 10 – Excavation and Trenching

.2 Section 23 05 05 – Well Field Pipework.

1.3 REFERENCE STANDARDS

.1 Section 01 42 19 – Reference Standards.

.2 Abbreviations for electrical terms shall be to CSA Z85-1983.

.3 Abbreviations of standards organizations referenced in this and other sections are as follows:

ACI	American Concrete Institute
CSA	Canadian Standards Association
CEC	Canadian Electrical Code
IEEE	Institute of Electrical and Electronic Engineers
ANSI	American National Standards Institute
NBC	National Building Code
NFPA	National Fire Protection Association
EEMAC	Electrical & Electronic Manufacturers Association of Canada (formerly CEMA)
FM	Factory Mutual
NEMA	National Electrical Manufacturers Association (U.S.)
JIC	Joint Industry Conference

IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
IES	Illuminating Engineering Society
NETA	National Electrical Testing Association
CUL	Canadian Underwriters Laboratories Inc.
ETL	Electrical Testing Laboratories, Inc.

.4 ASTM American Society for Testing and Materials

.5 ASTM International (ASTM)

.1 ASTM C117, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

.5 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3).

.6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.6 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.7 CSA Group (CSA)

.1 CAN/CSA-A3000, Cementitious Materials Compendium.

.1 CSA-A3001, Cementitious Materials for Use in Concrete.

.2 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.4 DEFINITIONS

.1 Common excavation – Excavation of materials of whatever nature, which are not included under definitions of solid rock, including dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.

.2 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.3 Subsoil: materials excavated directly beneath the topsoil layer. Capable of supporting root growth and suitable for use in landscape restoration.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded and required for construction of fill areas or for other portions of Work.

.6 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials under excavated areas.

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to [CAN/CGSB-8.2] [CAN/CGSB-8.1].

.2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.7 SMDD: Standard Maximum Dry Density in accordance with ASTM D698.

.8 Corrected maximum dry density is defined as (correction applied for plus 20 mm material):

.1 1.4.9.1 D – (F1 x D1) + (0.9 x D2 x F2).

.2 Where: D = corrected maximum dry density kg/m. F1 = fraction (decimal) of total field sample passing 5 mm sieve. F2 = fraction (decimal) of total field sample retained on 5 mm sieve. (equal to 1.00 – F1) D1 = maximum dry density, kg/m of material passing 5 mm sieve determined in accordance with ASTM D698. D2 = bulk density, kg/m, of material retained on 5mm sieve, equal to 1000 G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.

.3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 wet method when directed by the Engineer.

1.5 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control.

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit to Engineer Testing/Inspection results as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Inform Engineer at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

.3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.

.4 Ship samples prepaid to Engineer, in tightly closed containers to prevent contamination and exposure to elements.

.5 At least 4 weeks prior to beginning Work, inform Engineer source of fly ash and submit samples to Engineer.

.1 Do not change source of fly ash without written approval Engineer.

1.6 APPROVALS

.1 At least 4 weeks prior to commencing delivery of granular materials, the contractor must provide the Engineer with documentation specifying the source (i.e., origin) and environmental quality of all proposed materials and provide samples as required by the Engineer.

.2 If, in opinion of the Engineer, materials from the proposed off-site source do not meet, or cannot reasonably be processed to meet specified requirements, locate alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Should a change of off-site material source be proposed during Work, advise Engineer 2 weeks in advance of proposed change to allow sampling and testing.

.4 Acceptance of material does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.

1.7 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit design and supporting data at least 2 weeks prior to beginning Work.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Alberta, Canada.

.4 Keep design and supporting data on site.

.5 Engage services of qualified professional Engineer who is registered or licensed in Alberta, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.6 Do not use soil material until written report of soil test results are approved by Engineer.

.7 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29 – Health and Safety Requirements.

PART 2 PRODUCTS

2.1 MATERIALS – GENERAL

.1 Materials to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrate particles.

.2 Materials should be free of unsuitable materials including:

.1 Frozen material or material containing snow or ice.

.2 Tree stumps, branches, roots, or other wood or lumber.

.3 Wire, steel, cast iron, cans, drums, or other foreign material.

.4 Materials containing hazardous or toxic constituents at hazardous or toxic concentrations.

.3 Compactable to specified density.

2.2 NATIVE BACKFILL

.1 Native excavated soil used to construct the Works on the Site, free of unsuitable materials.

.2 Unsuitable materials: Materials not approved for use as determined by the Engineer and include the following:

.1 Material containing loam, roots or organic matter.

.2 Clay which are classified as inorganic clays of high plasticity in accordance with ASTM D2487.

.3 Soft and/or organic clays and silts of low strength.

.4 Rock and lumps of material with dimensions greater than specified layer thickness before compaction.

2.3 FILL

.1 Native soil from on-site stockpiles or excavated native soils used to construct the Works on the Site, free of unsuitable materials.

.2 Unsuitable materials: Materials not approved for use as determined by the Engineer and include the following:

.1 Material containing loam, roots or organic matter.

.2 Clay which are classified as inorganic clays of high plasticity in accordance with ASTM D2487.

.3 Soft and/or organic clays and silts of low strength.

.4 Rock and lumps of material with dimensions greater than specified layer thickness before compaction.

2.4 PEA GRAVEL

.1 Size: 10 mm washed round stone

.2 Gradation:

ASTM Sieve Size	Percent Passing by Weight
12.5 mm	100%
6.3 mm	0%

.3 Content: No more than 3 percent limestone.

.4 Free of fine material prior to placement.

2.5 BEDDING SAND

.1 Washed sand.

.2 Gradation:

ASTM Sieve Size	Percent Passing by Weight
4.76 mm	100%
0.074 mm	0%

.3 Free of clay and other deleterious materials.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Ensure that all grades and elevations are as per Drawings.

.2 Suspend operations whenever climatic conditions, as determined by the Engineer, are unsatisfactory for placing fill to the requirements of this Section.

.3 Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, measurements, tests, or approvals.

.4 Obtain approval from Engineer for completed excavations and previously placed material prior to placement of successive lifts.

.5 Obtain approval from Engineer prior to placing fill against structures or around exposed buried utilities.

.6 Ensure areas to be backfilled are free from debris or water.

3.2 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Locate, identify, and protect utilities that remain from damage. Confirm locations of buried utilities and structures by careful test excavations or other suitable means.

.3 Protect plant life, vegetation, and other features which will be part of the final landscaping.

.4 Protect bench marks, survey control points, existing structures, fences, paving and curbs from excavating equipment and vehicular traffic.

.5 Maintain and protect wells, utilities, and structures encountered. In event of disturbance or damage to any wells, utilities, or structures, immediately notify the Engineer. Repair or replace any damaged wells, utilities, or structures damaged by Contractor operations.

.6 Protect existing surface features which may be affected by the Works.

.7 Protect existing structures where temporary unbalanced earth pressures may develop due to the Works. Utilize bracing, shoring or other approved methods to counteract unbalance.

.8 Protect excavations and trenches from contamination.

.9 Obtain directions from Engineer prior to moving or otherwise disturbing utilities or structures.

.10 Compact sub-grade to density requirements.

.11 Remove soft areas of sub-grade which are not capable of compaction in place. Backfill these areas with approved native fill and compact to density requirements.

.12 Remove debris, contamination, or water from areas to be backfilled.

.13 Proof roll sub-grade surface to identify soft spots. Fill and compact to required density.

3.3 PLACEMENT

.1 Place material only on a clean unfrozen surface, properly shaped and compacted and free from snow or ice.

.2 Place material using methods which do not lead to segregation or degradation.

.3 Place material in uniform layers not exceeding 150 mm when compacted or to such other depth as approved.

.4 Shape each layer to a smooth contour and compact before succeeding layer is placed.

.5 Remove and replace portion of layer in which material has become segregated during spreading.

3.4 FILLING – BACKFILLING

.1 Place and compact suitable Native Backfill, stockpiled or excavated from the Site, as directed by Engineer.

.2 Place in equal continuous layers not exceeding 300 mm compacted depth.

.3 Fill areas to grades and elevations as shown on the Drawings.

.4 Employ a placement method that does not disturb or damage other Works.

.5 Maintain optimum moisture content of backfill materials to attain required compaction density.

.6 Do not use fill material which is determined unsuitable by Engineer.

.7 Do not operate heavy compaction equipment closer than 1 meter to foundations, underground utilizes, monitoring wells, or landfill gas extraction wells.

.8 Backfill around installations as follows:

.1 Do not dump directly against or over installations.

.2 Place layers on both sides of the installed Works to equalize loading and minimize movement of the installed Works.

.9 Do not operate heavy compaction equipment closer than 1 meter to foundations, underground utilities, monitoring wells, or landfill gas extraction wells.

.10 Do not backfill around or over cast-in-place concrete within 7 days of concrete placement.

.11 Grade changes shall be made gradual.

.12 Place backfill continuously and in uniform layers not exceeding specified compacted thickness up to grades shown on the Drawings.

.13 Compact each layer to specified densities specified in this Section prior to placing subsequent layers.

3.5 COMPACTION – GENERAL

.1 Apply potable water as necessary during compaction to obtain specified density. Excessively moist material shall be aerated with suitable equipment and methods until optimum moisture content is achieved. In areas where the use of rolling equipment is not possible, compact materials to specified density with mechanical tampers.

.2 When fill material is wetted to achieve desired moisture, ensure that finer materials are not washed out by jets of water.

.3 Compaction Equipment: The type, size, and efficiency of compaction equipment shall be capable of achieving the specified degree of compaction.

3.6 TOLERANCES

.1 Finish compaction surface to within ±10 mm of established grade but not uniformly high or low.

.2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.3 Payment will not be made for material placed outside the tolerance limits unless directed by Engineer.

3.7 QUALITY CONTROL

.1 Section 01 45 00 – Quality Control: Field Inspection and testing.

.2 Contractor shall test installed materials to confirm compliance with specifications.

.3 Submit copies of the test reports to the Engineer.

.4 Verification Testing by Engineer:

- .1 Engineer may select samples of uncompacted fill intended for the Works and samples of compacted fill of the Works.
- .2 Engineer may perform tests in the field and/or in the laboratory on samples of backfill and imported fill to determine if materials meet specifications. Imported fill tests will include analysis for the presence of contaminants, grain size analysis, moisture content, bulk wet density, maximum dry density, and permeability. Backfill testing will include moisture content determination, maximum dry density, and bulk wet density. Copies of the test reports will be supplied to the Contractor on request.
- .3 Testing by Engineer will in no way relieve the Contractor of responsibility for testing all material prior to notifying Engineer of the material's suitability for the Works.

.5 Methods of Testing:

.1 Particle size analysis shall be performed in accordance with ASTM D422 or ASTM D1140, whichever is appropriate for the material tested.

.2 Field compaction density analysis shall be performed in accordance with ASTM-D698.

.6 The Contractor shall test compaction density for backfill placed within the LFG Control Plant Plant Compound and Header Pipe of waste alignment off waste:

.1 Pipe Bedding: 1 test per lift per 20 linear meters of pipe installed (outside limit of waste).

.2 Fill: 1 test per lift per 20 linear meters of pipe installed (outside limit of waste).

.3 Native Backfill: 1 test per lift per 20 linear meters of pipe installed (outside limit of waste).

.7 Failure to meet specified requirements: If material specifications cannot be achieved or obtained with the equipment in use, procedures, or materials, remove and replace the work and modify operations so that the equipment, procedures and materials will be able to produce the required results. Additional testing required by the Engineer will be to Contractor's account.

3.8 ADJUSTING

.1 Section 01 73 00 – Execution: Requirements for adjusting installed works.

.2 Finish compacted soil surfaces within 25 mm of grades shown in Drawings. Correct surface irregularities by loosening and adding or removing materials until the surface is within the specified grades.

.3 Grade works with slopes to permit proper drainage and free of depressions that can lead to ponding or collection of water and/or debris which may restrict flow.

3.9 CLEANING

.1 Section 01 73 00 – Execution: Requirements for cleaning installed works.

.2 Clean and reinstate work areas and areas affected by the Works to specified restoration condition.

.3 Upon completion of backfilling, remove excess materials and debris from work areas and travel routes.

3.10 PROTECTION OF FINISHED WORKS

.1 Section 01 73 00 – Execution: Requirements for protecting installed works.

3.11 SCHEDULE

.1 Bedding Sand: Compact to 95 percent SMDD.

.2 Fill: Compact to 95 percent SMDD.

.3 Native Backfill: Compact to 95 percent SMDD.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 No separate payment will be made for Work under this Section.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

.1 This section includes the supply and installation of the vertical extraction wells as shown in the Drawings. This section must be referenced and interpreted simultaneously with all Other sections pertinent to the Works described herein.

1.2 SECTION INCLUDES

.1 Vertical Wellhead Assembly.

.2 Vertical Extraction Wells.

.3 Well Aggregate.

.4 Bentonite Chips.

.5 Membrane Seal.

.6 Execution.

.7 Measurement and Payment.

1.3 RELATED REQUIREMENTS

.1 Section 01 35 29 – Health and Safety Requirements.

.2 Section 23 05 05 – Well Field Pipework.

.3 Section 31 23 33.02 – Fill.

1.4 REFERENCE STANDARDS

.1 Section 01 42 19 – Reference Standards.

.2 Latest version of the ASTM Standards:

.1 ASTM D2487 – Classification of Soils for Engineering Purposes.

.2 ASTM D2488 – Description and Identification of Soils (Visual - Manual Procedure).

.3 ASTM D1784 – Standard Specification for Rigid PVC Compounds and CPVC Compounds.

.4 ASTM D1785 – 12 Standard Specification for PVC Plastic Pipe, Schedules 40, 80, and 120.

.5 ASTM F480 – 12 Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in SDR, SCH 40, and SCH 80.

.6 ASTM C33 – Standard Specification for Concrete Aggregates.

.7 ASTM C136 – Test Method for Sieve Analysis for Fine and Course Aggregate.

.8 ASTM A106 – Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service.

.9 ASTM D3350 – Specification for Polyethylene Plastic Pipe and Fitting Materials.

.10 Most Current set of CSA Standards Contract Drawings and Standard Details.

1.5 SUBMITTALS

.1 Submit driller qualifications, including the driller's license number.

.2 Provide the Engineer with a drilling log prepared by an engineer or geologist at the site with the following information included:

.1 Name of supervising professional engineer, registered geologist, or other qualified person completing the form.

.2 Description of materials encountered, including generalized composition, level of decomposition, and level of compaction.

.3 Coordinates of all well locations (with horizontal and vertical accuracy to 5 cm).

.3 The Contractor shall submit to the Engineer, a final well record log with the following information included:

.1 Borehole diameter.

.2 Bottom of casing and bottom of borehole depth.

.3 Casing material, diameter, and wall thickness (SDR or Schedule).

.4 Perforated and/or screened interval.

.5 Type, size and intervals of pea gravel, bentonite seals and fill.

.6 Name of supervising professional engineer, registered geologist, or other qualified person completing the log.

.4 The Contractor shall review the specifications and identify all required project submittals. The submittals listed below are intended as a general summary of the submittal items contained within this section. This submittal list does not release the Contractor from the responsibility of identifying and providing all information requested:

.1 Wellhead assemblies.

.2 Vertical well casing.

.3 Slip joint assembly.

.4 Vertical well aggregate.

.5 Bentonite.

.6 Membrane seals.

1.6 QUALITY ASSURANCE

.1 Procure permits, certificates, and license required by law for the execution of the Works. Comply with Laws and Regulations relating to the performance of the Works.

1.7 QUALIFICATIONS

.1 Drilling Firm:

.1 Company specializing in performing the Works identified in this Section.

.2 Drilling Crew:

.1 One (1) crew member shall have a minimum of five (5) years' experience in performing the Works outlined in this section.

1.8 EXISTING CONDITIONS

.1 Due to the nature of activities which take place at the location of the Works, the extraction well will penetrate through landfill waste and may encounter asbestos.

.2 Assume that work undertaken at or below the surface of the landfill cover will have landfill gas present. Landfill gas is comprised of methane, carbon dioxide, and a wide range of trace gasses as identified in Section 01 35 29 – Health and Safety Requirements.

1.9 SEQUENCING AND SCHEDULING

.1 Submit in accordance to Section 01 33 00 – Submittal Procedures.

.2 Sequence and schedule the work subject to the following conditions:

.1 Contractor shall survey and layout all well field components prior to the commencement of work.

.2 The Engineer will determine the location and sequence of drilling events, and completion of wells.

.3 Uncompleted wells are to be covered at the end of the day to prevent access to the hole and minimize the release of landfill gas.

.4 Complete drilling and installation activities at each well in its entirety before commencing work on other wells.

.5 The Engineer will determine if and when refusal in a borehole has occurred and whether the borehole is to be abandoned.

PART 2 PRODUCTS

2.1 VERTICAL WELLHEAD ASSEMBLY

.1 QED 50 mm (2 inch) ORP215M vertical wellhead or approved equivalent.

.1 Standard product design shall include a precision gas control valve, Quick-change Orifice Plate Assembly, thermometer control port, access and sampling ports with the following specifications:

.1 The Wellhead shall incorporate a housing that will allow the operator to quickly change the orifice plates if necessary.

.2 The orifice plates shall be constructed of 1.59 mm (1/16”) laser cut stainless steel.

.3 Each plate shall have an easy to red tab with the plate size. The plate size shall be legible without removing the plate from the housing.

.4 Each well head will be provided with a 1.9 cm (3/4 inch) orifice plate for the flow range 5.9 – 19.6 SCFM.

.2 Accessories:

.1 Transition Adapter: Landtec transition adapter or approved equivalent.

.1 Size: 75mm x 50mm.

.2 PVC Flex Hose:

.1 Newline NL2155-200 low temperature PVC flex hose or equivalent.

.2 Diameter: 50 mm.

.3 Temperature Rating: - 40 to 65 degrees Celsius.

.3 Hose Clamps: SS band clamps

.4 Insulation

.1 Wellhead: QED Polar Guard or approved equivalent.

.2 Vertical Riser and Flex Hose: Crosswrap Insulation or approved equivalent.

.5 PVC Flanges: SCH 80 as shown on Drawings.

.6 PVC Pipe: SCH 80 as shown on Drawings.

.7 PVC Fittings: SCH 80 as shown on Drawings.

.8 Sample Port: Chemline, 12 mm diameter compact ball valve, Teflon seat, female threads both ends.

.9 Sample fitting: 12 mm diameter stainless steel male NPT to 6 mm diameter hose barb end, Swagelok or approved equivalent.

.10 PVC Ball Valve: Chemline, PVC, True Union Type 21 manual ball valve or approved equivalent.

.1 Diameter: 50 millimeter.

.2 Process Fluid: Landfill Gas.

.3 Body: PVC.

.4 Ends: SOC.

.5 Body and Stem Seal: Viton.

.6 O-Ring: Viton.

.7 Seat: Viton.

.8 Actuator: manual.

2.2 VERTICAL EXTRACTION WELLS (RISER PIPE AND WELL SCREEN)

.1 Riser Pipe

.1 Upper Section (PVC): CSA B137.3, Schedule 80, 75 mm diameter, non-perforated as shown on the Drawings.

.2 Perforated Pipe

.1 Lower Section (PVC): CSA B137.3, Schedule 80, 100 mm diameter, perforated as shown on Drawings.

.3 Accessories:

.1 O-rings: neoprene, sized to fit tightly between the 75 mm diameter riser pipe and the 100 mm diameter perforated pipe. Quantity: 3 per well.

.2 Caps: End cap 100 mm diameter PVC cap (SOC), bottom of perforated pipe, solvent welded. Temporary top cap 75 mm diameter, SOC, do not solvent weld.

.3 Slip joint: 100 mm diameter x 75 mm diameter PVC flush style reducer bushing (spigot x socket), with drilled 75 mm diameter hole to provide snug fit for 75 mm non-perforated PVC riser pipe.

.4 Geotextile: nonwoven geotextile, 200 grams per square meter or as approved by Engineer.

.5 Fittings (PVC): CSA B137.3, SCH 80, as shown on drawings.

.6 Fasteners: Stainless steel sheet metal screws, corrosion resistant, Phillips pan head. Sized flush with inside of pipe.

2.3 WELL AGGREGATE

.1 Pea Gravel: Refer to Section 32 23 33.02 – Fill.

2.4 BENTONITE CHIPS

.1 The bentonite shall be high-swelling, sodium montmorillonite (in pellet form) containing no added organic polymers. The material shall exhibit the following properties:

.1 Plasticity Index: 54 per ASTM D4318.

.2 Expansion Index: 289 per UBC 29-2.

.2 The bentonite shall be placed in thin lifts with each lift properly hydrated prior to placement of the subsequent lift. Water added to bentonite shall be of suitable quality and free of pollutants and contaminants.

.3 Manufacturer's cut sheets shall be submitted a minimum of seven days prior to the start of construction. Manufacturer's product certifications shall be provided prior to delivery of the material to the site.

2.5 MEMBRANE SEAL

.1 The membrane seal shall be a LANDTEC-WBS membrane seal or approved equal and shall consist of a PVC membrane panel, integral pipe boot, butyl sealing tape, and stainless steel hose clamp. The seal shall have minimum dimensions of 3 m x 3 m (approximately 10 feet x 10 feet).

.2 The integral membrane pipe boot shall be located in the center of the seal. The boot shall fit over the well or other protrusion, and be approximately 76.2 cm (30-inch) high in its uncompressed state.

.3 The seal shall be capable of withstanding the rigors of landfill gas recovery application including weathering, gas constituent, settling, and normal ultraviolet light exposure.

.4 The membrane seal shall be suitable for use with pipes between 7.5 cm and 20.3 cm (3-inch and 8-inch) nominal diameter.

.5 The hose clamp used to secure the boot to the pipe shall be stainless steel and have a nominal width of at least 6.35 mm (1/4-inch). It shall be adjustable with a standard screwdriver and nut driver.

.6 Manufacturer's cut sheets shall be submitted a minimum of seven days prior to the start of construction. Manufacturer's product certifications shall be provided prior to delivery of the material to the site.

PART 3 EXECUTION

3.1 GENERAL

.1 The Contractor shall install the wellheads at the locations as shown on the Drawings.

.2 The Contractor shall provide all necessary components for assembly of the wellhead assembly.

.3 The valve operation shall be checked by CQA Monitor to confirm that the valve turns freely and that the valve is left in the CLOSED position.

.4 Contractor to provide a Letter of Conformance once the wells have been installed and tested confirming the system is ready for commissioning and start up.

3.2 PREPARATION

.1 Survey and mark all vertical well locations.

.2 Review well locations with Engineer and adjust as required to facilitate construction of Works.

.3 Construct temporary drilling platforms and roadways to facilitate drill rig access to the vertical well locations. Alter landfill side slopes as approved by Engineer.

3.3 DRILLING

.1 Use drilling equipment and methods approved by Engineer.

.2 Well boring shall utilize flight auger drilling and shall provide a nominal borehole diameter of 300 mm minimum for each LFG well. Air rotary or mud rotary drilling is not suitable for this work.

.3 Drill borehole minimum 300 mm diameter to a minimum depth of 15 m at locations shown on Drawings or as directed by Engineer.

.4 Drill boreholes true to line and plumb.

.5 Construct each well in accordance with the details as shown on Drawings and as directed by Engineer.

.6 Exercise extreme caution when drilling wells to follow depth information provided and to ensure extraction wells do not extend closer than 3 m to the base of the landfill.

.7 If perched groundwater or the bottom of the landfill refuse is encountered prior to reaching the indicated Well Schedule depth, the Contractor shall install a bentonite seal extending up 1,500 mm from the bottom of the boring. The bentonite shall be #8 and shall be placed in thin lifts with each lift properly hydrated prior to placement of the subsequent lift.

.8 Borings shall be logged, in addition to the contractor’s daily drilling log.

.9 The Contractor shall provide fans to control emissions at surface while undertaking drilling activities.

.10 The Contractor shall not leave any borings open when work is not actively in progress unless an approved cover is placed over the surface of the well.

.11 The Contractor shall place drill cuttings (construction spoils) on a liner and cover the cuttings with plastic sheeting. These temporary stockpiles of construction spoils shall not exceed 50 cubic yards. Well cuttings shall be disposed of at the active landfill face, as directed by the Engineer.

.12 Boring Depths: Actual depths be dependent on conditions encountered during drilling.

3.4 BOREHOLE LOGGING

.1 Maintain a log or record of each borehole which shall include the following information:

- .1 The general character, thickness, and type of material encountered.
- .2 The depth at which leachate was encountered, if encountered.
- .3 The total depth of the extraction well.
- .4 The depth below ground surface of perforated and non-perforated pipe sections.
- .5 Quantities of materials placed in the boreholes.
- .6 Elevation of top of well riser.

3.5 WELL ABANDONMENT

.1 In the event of well abandonment because of loss of tools or equipment, caving-in of the drilled borehole, or due to Contractor negligence, if requested and as directed by Engineer, fill the abandoned hole with drill cuttings and place a 500 mm bentonite seal directly below the landfill cover soil layer. Well abandonment due to Contractor negligence will be at Contractor's expense. Ensure bentonite seal contacts interim landfill cover.

.2 Restore landfill cover to existing grades.

.3 Abandonment of a borehole due to refusal and not due to Contractor equipment loss, equipment failure, caving-in of the borehole, or negligence, which is beyond Contractor's control, will be compensated at the rates provided in the Schedule of Prices. Engineer will make determination on whether borehole is abandoned due to refusal.

.4 Refusal is the demonstrated inability to advance a borehole to the design depth for installation of a well being installed in the waste. To qualify for payment in accordance with the additional unit prices, Contractor will have to demonstrate that the equipment is working properly at full power and that advance of the auger tip has been less than 150 mm over a continuous 30 minute period of continuous application under full power.

3.6 VERTICAL GAS EXTRACTION WELL INSTALLATION

.1 PVC pipe joints shall be flush thread connected.

.2 Cap base of perforated PVC extraction well pipe. Secure base cap with PVC solvent cement.

.3 Construction of slip joint:

- .1 Construct slip joint as shown on Drawings with neoprene O-rings to fit tightly between 75 mm non-perforated riser and 100 mm perforated riser.
- .2 Machine SCH 80 PVC reducer bushing allow for clearance of 75 mm non-perforated pipe without binding.
- .3 Install stainless steel sheet metal screws in 75 mm riser pipe 1000 mm from end of non-perforated 75 mm riser pipe. Ensure that ends of screws filed smooth and are flush with inside of the PVC pipes.
- .4 Secure reducer bushing to top of 100 mm perforated pipe section with PVC solvent cement and 4 stainless steel screws. Ensure stainless steel screws do not penetrate through the PVC bushing and bind to the 75 mm non-perforated pipe.
- .5 Wrap nonwoven geotextile around well slip joint and fasten with plastic ties.

.4 Place riser pipe and perforated pipe immediately after drilling. Set firmly in place centrally located in borehole.

.5 Pea Gravel Placement:

.1 Place Pea Gravel in annular space of borehole to 300 mm above perforated depth.

.2 To prevent bridging, pour aggregate gradually and carefully into annular space as determined by volume measurements and sounding with a weighted tape. Sound enough so that placement is accurate to within 50 mm.

.6 Bentonite Chip Placement:

.1 Bentonite shall be placed at the depths and thicknesses indicated on the drawings.

.2 Bentonite shall be placed in thin lifts with each lift properly hydrated prior to placement of the subsequent lift.

.3 Water added to bentonite shall be of suitable quality and free of pollutants and contaminants. The top of the bentonite seals shall be sounded to ensure that no bridging occurred during placement.

.7 Maintain riser pipe free of contaminating materials.

.8 Extend riser to minimum 1.0 metre above grade.

.9 Place temporary PVC slip cap on riser. Do not solvent weld.

3.7 MEMBRANE SEAL

.1 The membrane shall be sealed to the well casings with membrane as specified and as shown on Drawings.

.2 The Contractor shall ensure the surface surrounding the well casing, on which the membrane seal will lay, is free from abrupt breaks, sharp objects, or other foreign materials that may inhibit placement or damage the membrane seal. All construction stakes, hubs, or other items used for grade control shall be removed and the voids shall be filled. The subgrade shall be unyielding, smooth and uniform. The surface shall not be pebbly, or tracked and rutted by equipment. No loose, coarse-grained materials shall remain on the surface of the subgrade.

.3 Fill, free of rocks, clods, or other materials that may damage the membrane seals shall be spread over the PVC membrane to a thickness of approximately 150 mm (6-inches), prior to placing any additional fill. Equipment placing fill within 18 inches above the PVC membrane shall be limited to track equipment exerting a ground pressure less than 6 psi.

3.8 WELLHEAD ASSEMBLY

.1 The Contractor shall install the wellheads at the locations as shown on the Drawings.

.2 The wellhead assembly shall be connected to the HDPE lateral piping via the 50 mm flex hose as shown on the Drawings.

.3 The Contractor shall provide all necessary components for installation of the wellhead assembly.

.4 The valve operation shall be checked by CQA Monitor to confirm that the valve turns freely and that the valve is left in the CLOSED position.

.5 The wellhead shall be airtight and leak free.

.6 It is the intent of this Specification that the wellhead assembly shall be supplied as a complete manufactured unit.

3.9 DISPOSAL OF CUTTINGS

.1 Dispose drill cuttings and solid waste generated during drilling in the active landfill area as directed by the Engineer.

3.10 CLEANING

.1 Clean drill augers and drilling rig before leaving place of Work.

.2 Clean, reinstate and restore work areas and areas affected by equipment, including access roads and drill pads.

3.11 PROTECTION OF FINISHED WORKS

.1 Protect completed wells and wells under construction from contamination.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

.1 Refer to Section 01 29 00 – Payment Procedures: Requirements for measurement and payment.

4.2 VERTICAL EXTRACTION WELLS

.1 Schedule of Prices Item No. 33 21 14/01

.2 Measurement Basis: Per linear metre drilled and installed, measured vertically from the landfill surface to the bottom of each borehole.

.3 Payment Basis: Unit Price. Includes surveying, access road and drill pad preparation, all costs associated with drilling, disposal of drill cuttings in active landfill area, supply and installation of extraction well and well components (solid and perforated pipes, pipe casing, slip joints, end caps, accessories, fasteners, bentonite, pea gravel), testing of joints prior to installation and QA/QC to ensure proper installation of wells, membrane seals, restoring access roads and drill pads to original condition, and regrading to original grades.

4.3 WELLHEAD ASSEMBLY

.1 Schedule of Prices Item No. 33 21 14/02

.2 Measurement Basis: Per wellhead assembly for new well installations.

.3 Payment Basis: Unit Price. Includes supply and installation of well head assemblies and accessories, connection to lateral pipes, and testing.

4.4 BOREHOLE REFUSAL

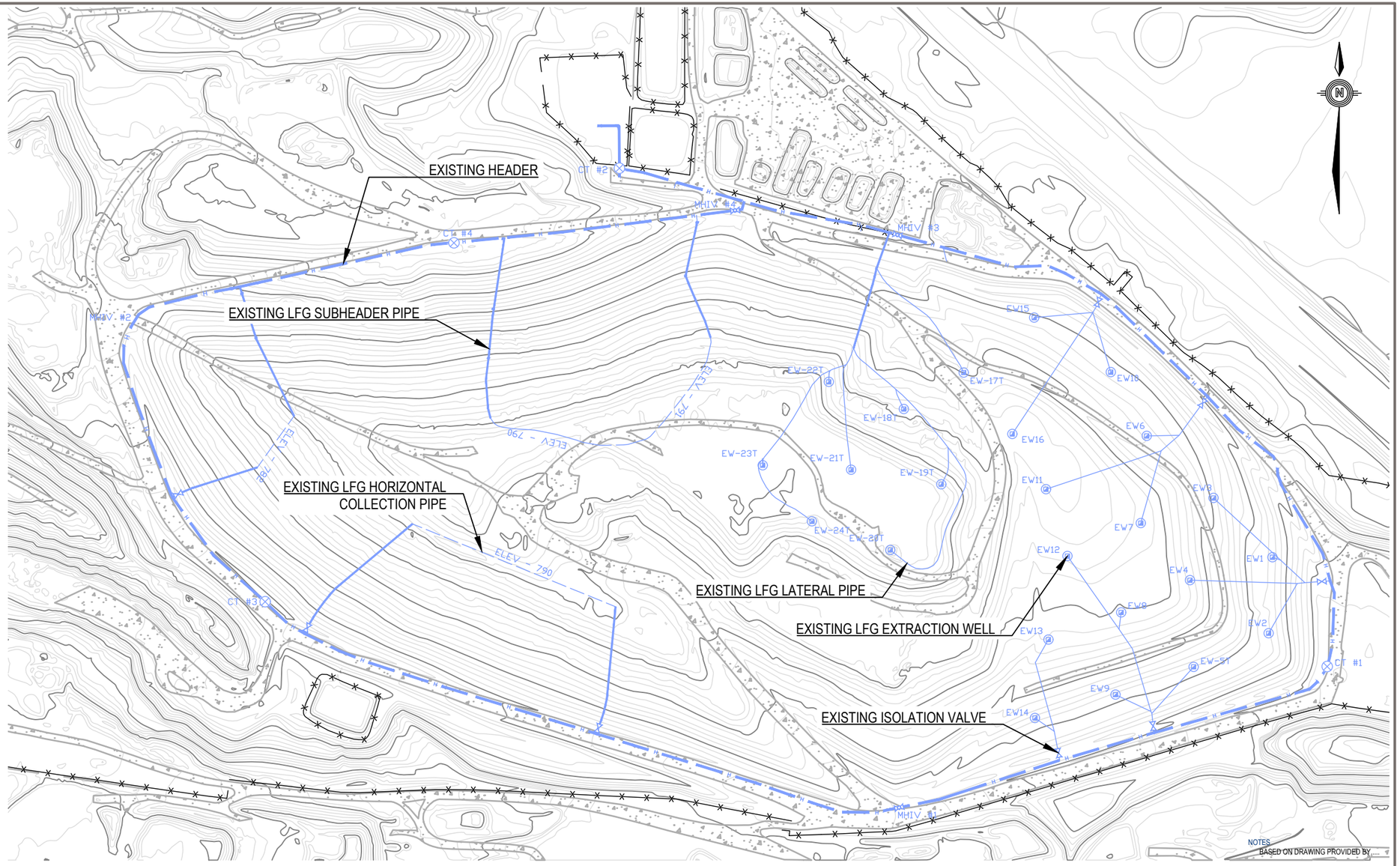
.1 Schedule of Additional Prices Item No. 33 21 14/01

.2 Measurement Basis: By the linear metre drilled.

.3 Payment Basis: Unit price. Includes drilling, backfilling drill cuttings, and supply and installation of bentonite.

END OF SECTION

APPENDIX B - DRAWINGS



LEGEND

- MAJOR CONTOURS (5m)
- MINOR CONTOURS (1m)
- LFG HEADER PIPE (EXISTING)
- 150Ø LFG SUBHEADER PIPE (PROPOSED)
- LFG SUBHEADER PIPE (EXISTING)
- LFG LATERAL PIPE (PROPOSED)
- LFG LATERAL PIPE (EXISTING)
- LFG HORIZONTAL EXTRACTION PIPE (EXISTING)
- PR54-20 — LFG WELL (PROPOSED)
- EW26-06 — LFG WELL (EXISTING)
- MHIV #2 — MAIN HEADER ISOLATION VALVES (EXISTING)
- SUBHEADER ISOLATION VALVE (PROPOSED)
- SUBHEADER ISOLATION VALVE (EXISTING)
- SUBHEADER BLIND FLANGE (PROPOSED)
- CT #3 — CONDENSATE TRAP

0 100 m

Scale: 1: 3 000

STATUS
FOR INTERNAL USE ONLY

NUM	DATE	APR	DESCRIPTION
REVISIONS			
B	JULY 10/20	ML	ISSUED FOR TENDER
A	JUNE 2020	ML	ISSUED FOR REVIEW - 90%
NUM	DATE	APR	DESCRIPTION
DRAWING STATUS			

PERMIT

PROFESSIONAL SEAL

CLIENT

REGIONAL DISTRICT of Fraser-Fort George

TETRA TECH

LFG WELLFIELD EXPANSION
FOOTHILLS BOULEVARD REGIONAL LANDFILL

EXISTING CONDITIONS

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04251-01	EDM	ML	ML	-	C100
DATE: July 2020	SHEET No. 1 of 5	DWN JL/RM	APP ML	STATUS B	

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Regional District of Fraser-Fort George\Production\SWM.SWOP04251-01-Well Field Review and Expansion\SWM.SWOP04251-01-Base Plan.dwg [C100] July 10, 2020 - 11:04:45 am (BY: MANDOUR, RANA)

LEGEND

- MAJOR CONTOURS (5m)
- MINOR CONTOURS (1m)
- LFG HEADER PIPE (EXISTING)
- 150Ø LFG SUBHEADER PIPE (PROPOSED)
- LFG SUBHEADER PIPE (EXISTING)
- LFG LATERAL PIPE (PROPOSED)
- LFG LATERAL PIPE (EXISTING)
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- PR54-20 — LFG WELL (PROPOSED)
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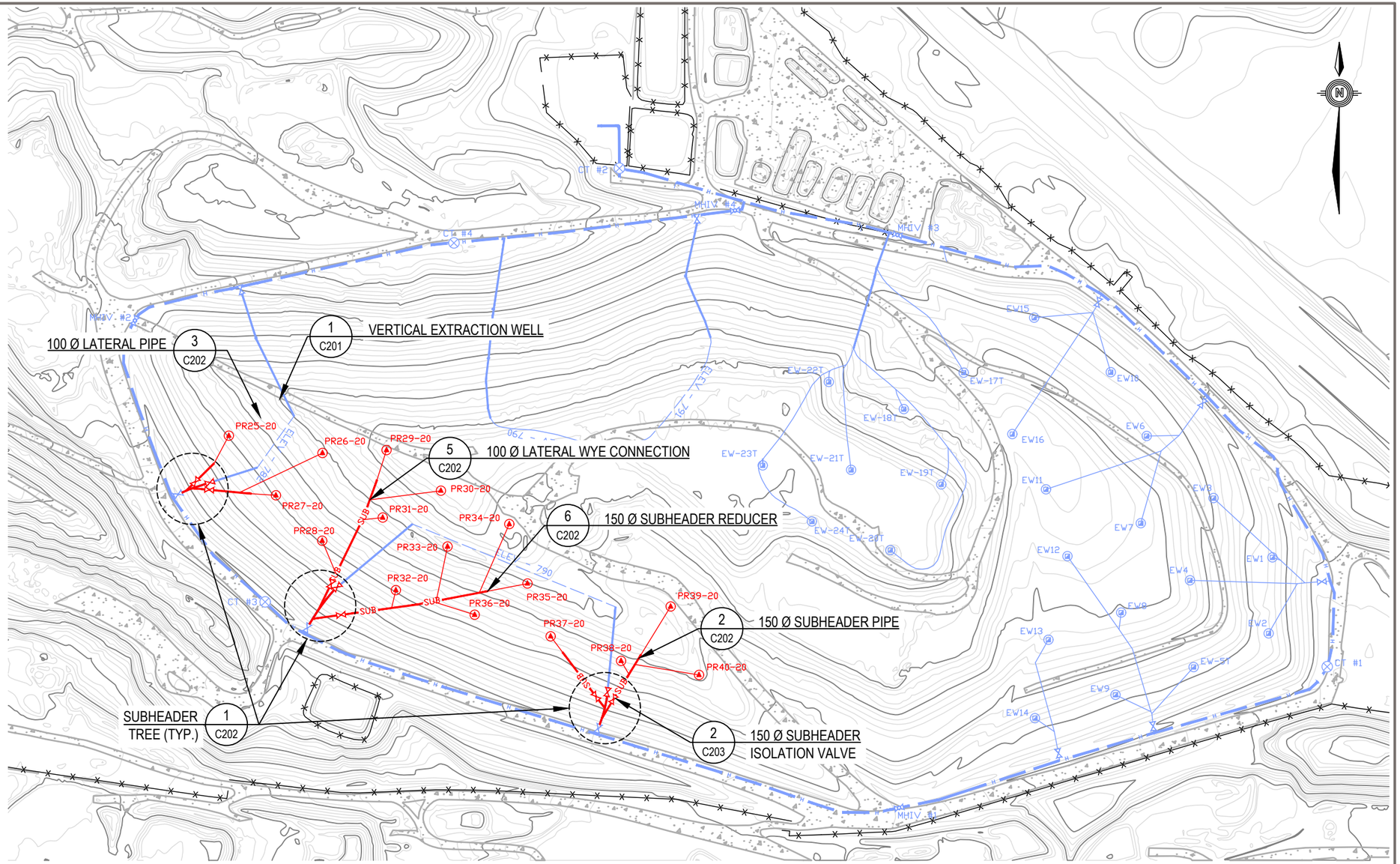
- SUBHEADER ISOLATION VALVE (PROPOSED)
- SUBHEADER ISOLATION VALVE (EXISTING)
- SUBHEADER BLIND FLANGE (PROPOSED)
- CT #3 — CONDENSATE TRAP



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Scale: 1: 3 000

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JULY 10/20	ML	ISSUED FOR TENDER
A	JUNE 2020	ML	ISSUED FOR REVIEW - 90%
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

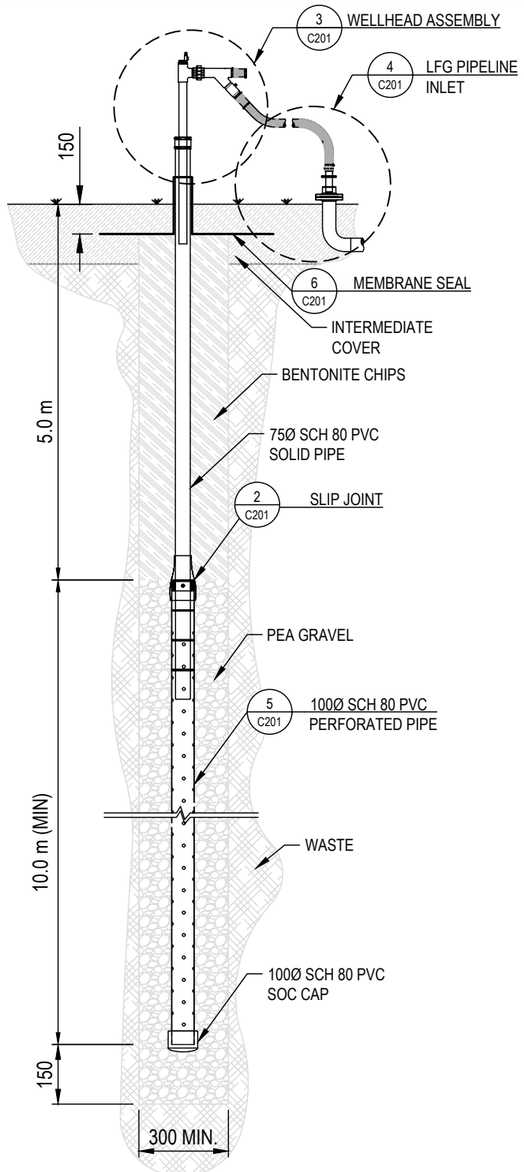
REGIONAL DISTRICT of Fraser-Fort George

TETRA TECH

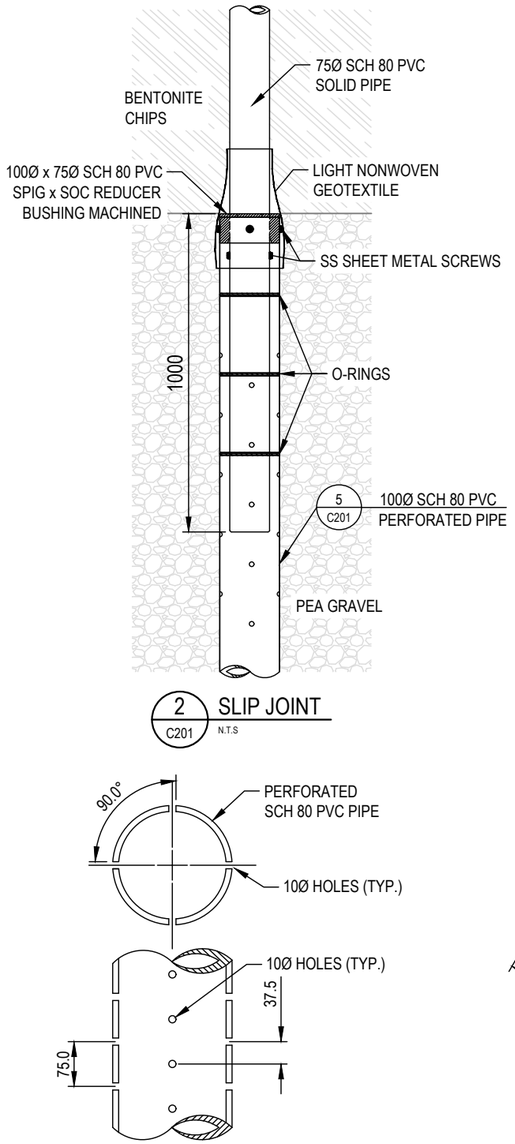
LFG WELLFIELD EXPANSION
FOOTHILLS BOULEVARD REGIONAL LANDFILL

PROPOSED WELLFIELD PLAN

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04251-01	EDM	ML	ML	-	C101
DATE: July 2020	SHEET No. 2 of 5	DWN JL/RM	APP ML	STATUS B	

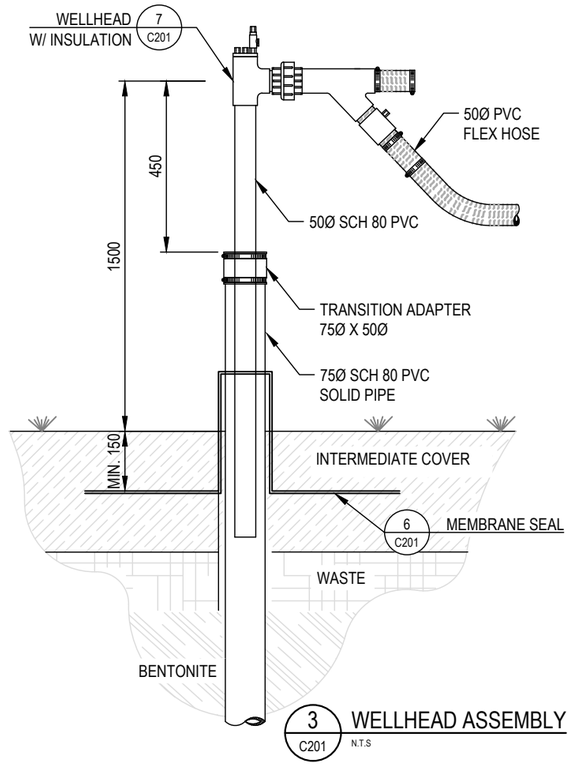


1 C201 VERTICAL EXTRACTION WELL (TYP.) N.T.S

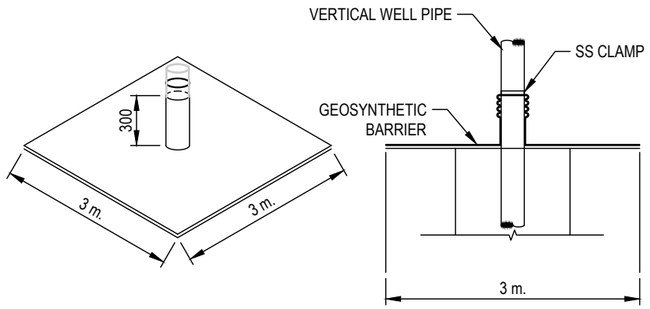


2 C201 SLIP JOINT N.T.S

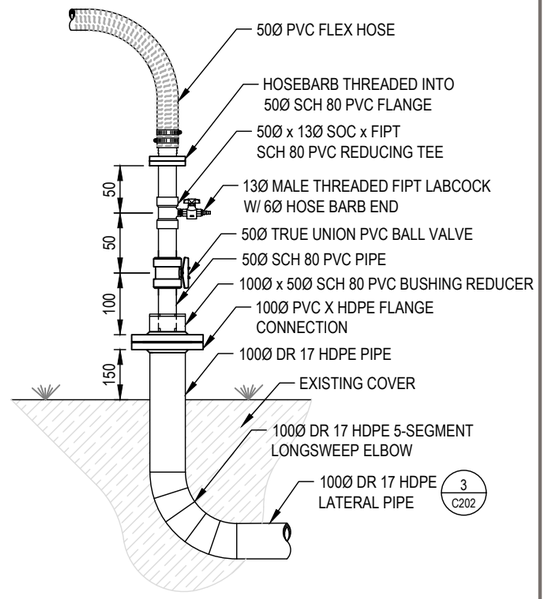
5 C201 VERTICAL EXTRACTION WELL PERFORATIONS N.T.S



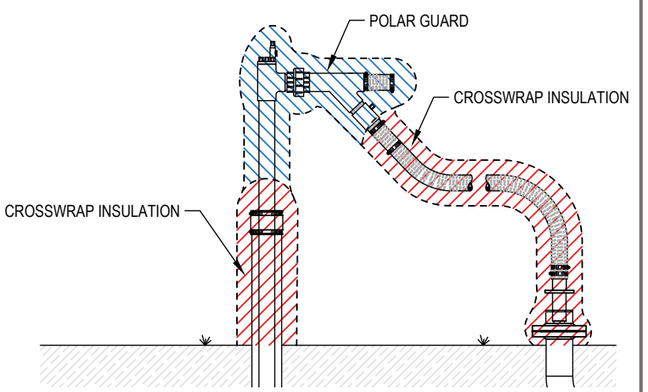
3 C201 WELLHEAD ASSEMBLY N.T.S



6 C201 MEMBRANE SEAL N.T.S



4 C201 LFG PIPELINE INLET N.T.S



7 C201 WELL INSULATION N.T.S

NOTES: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED.

NUM	DATE	APR	DESCRIPTION
REVISIONS			
B	JULY 10/20	ML	ISSUED FOR TENDER
A	JUNE 2020	ML	ISSUED FOR REVIEW - 90%
NUM	DATE	APR	DESCRIPTION
DRAWING STATUS			

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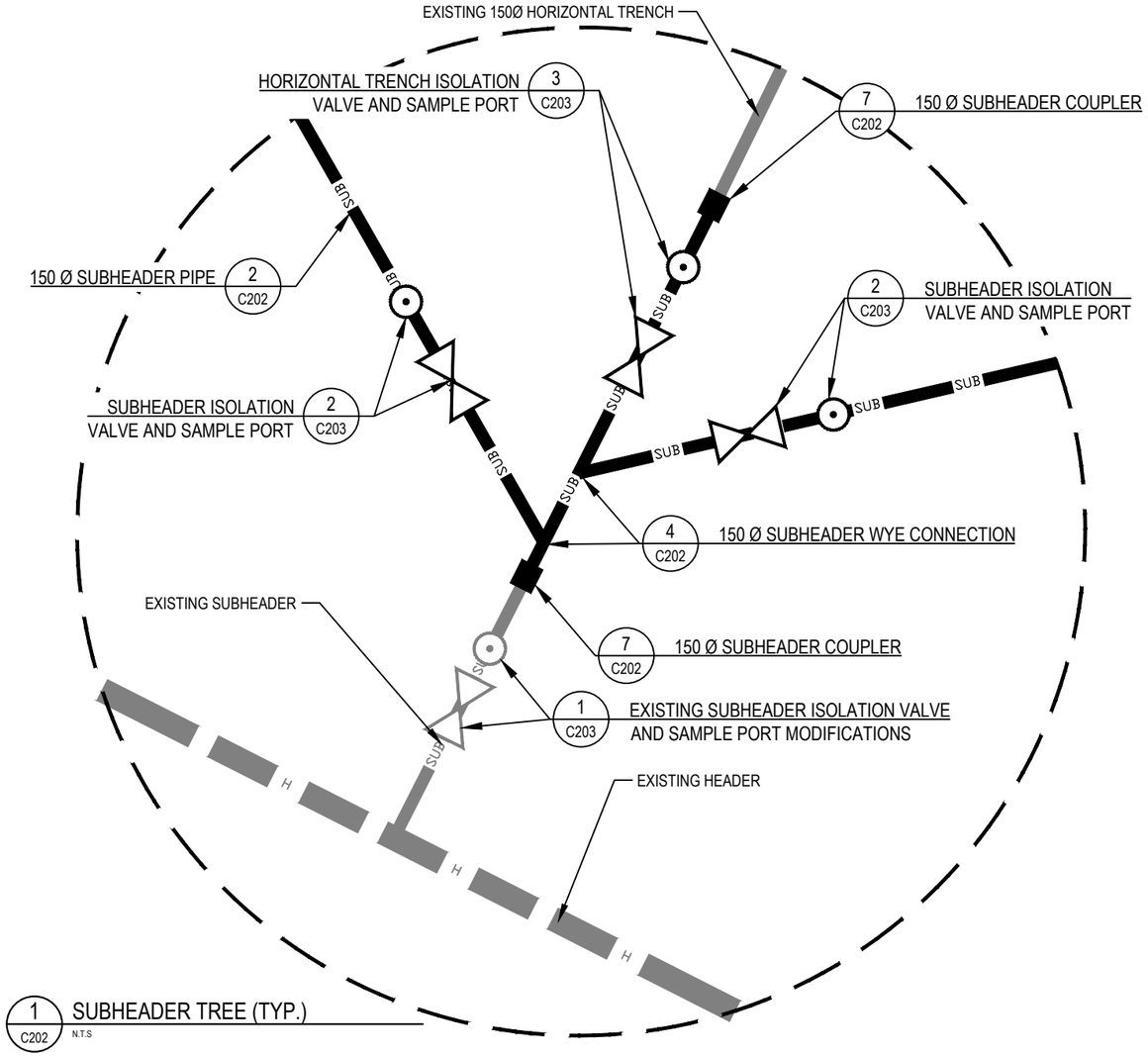
REGIONAL DISTRICT of Fraser-Fort George

TETRA TECH

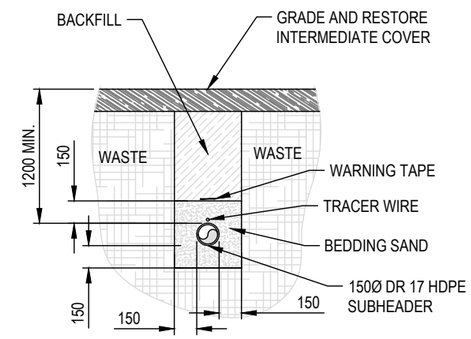
LFG WELLFIELD EXPANSION
FOOTHILLS BOULEVARD REGIONAL LANDFILL

DETAILS - VERTICAL EXTRACTION WELL - 1

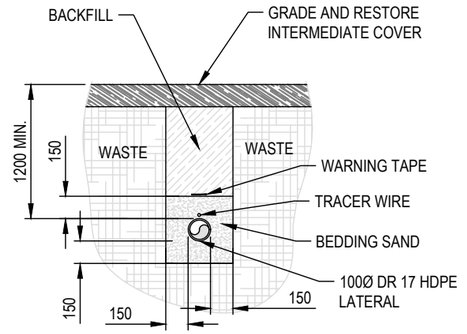
PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04251-01	EDM	ML	ML	-	**C201**
DATE: July 2020	SHEET No. 3 of 5	DWN JL/RM	APP ML	STATUS B	



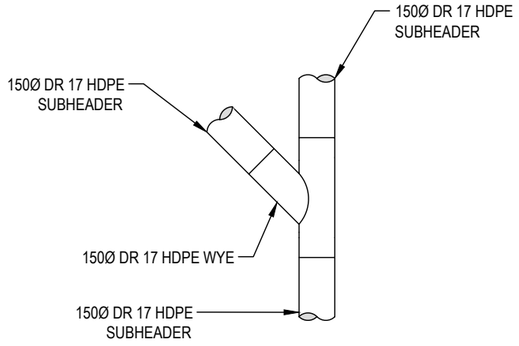
1 C202 SUBHEADER TREE (TYP.) N.T.S



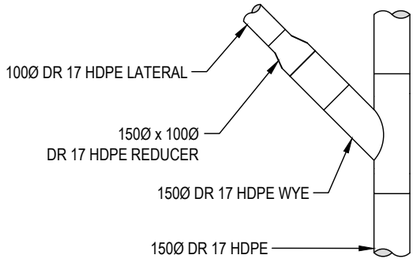
2 C202 150Ø SUBHEADER PIPE N.T.S



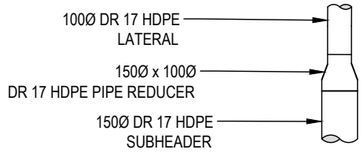
3 C202 100Ø LATERAL PIPE N.T.S



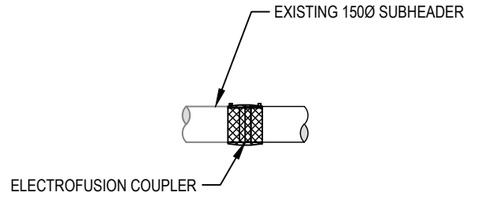
4 C202 150Ø SUBHEADER WYE CONNECTION N.T.S



5 C202 100Ø LATERAL WYE CONNECTION N.T.S



6 C202 150Ø SUBHEADER REDUCER N.T.S



7 C202 150Ø SUBHEADER COUPLER N.T.S

NOTES: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED.

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REVISIONS			
B	JULY 10/20	ML	ISSUED FOR TENDER
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NUM	DATE	APR	DESCRIPTION
DRAWING STATUS			

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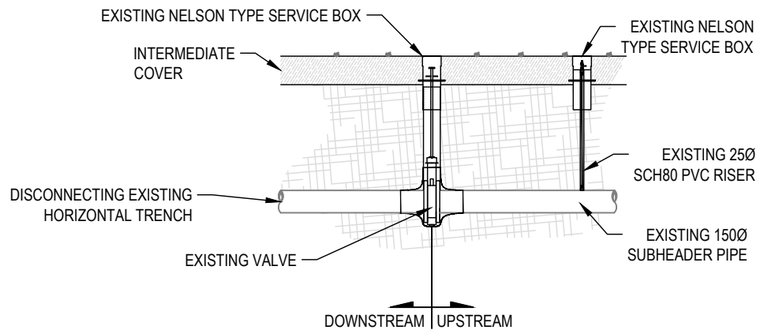
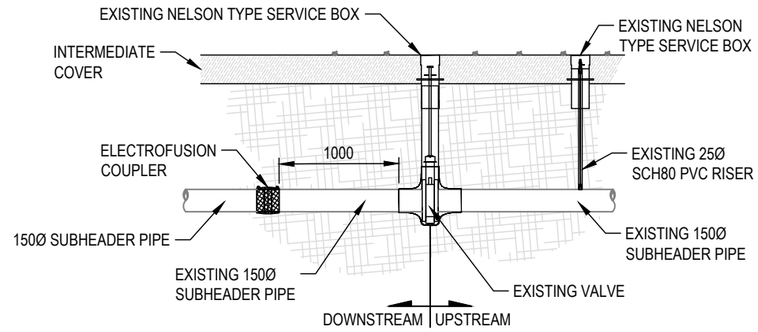
LFG WELLFIELD EXPANSION
FOOTHILLS BOULEVARD REGIONAL LANDFILL

DETAILS - PIPEWORKS - 1

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04251-01	EDM	ML	ML	-	**C202**
DATE: July 2020	SHEET No. 4 of 5	DWN JL/RM	APP ML	STATUS B	



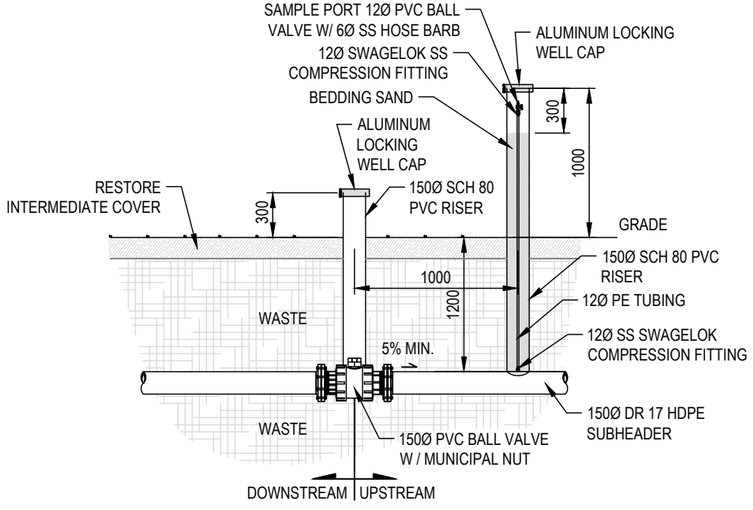


EXISTING

PROPOSED

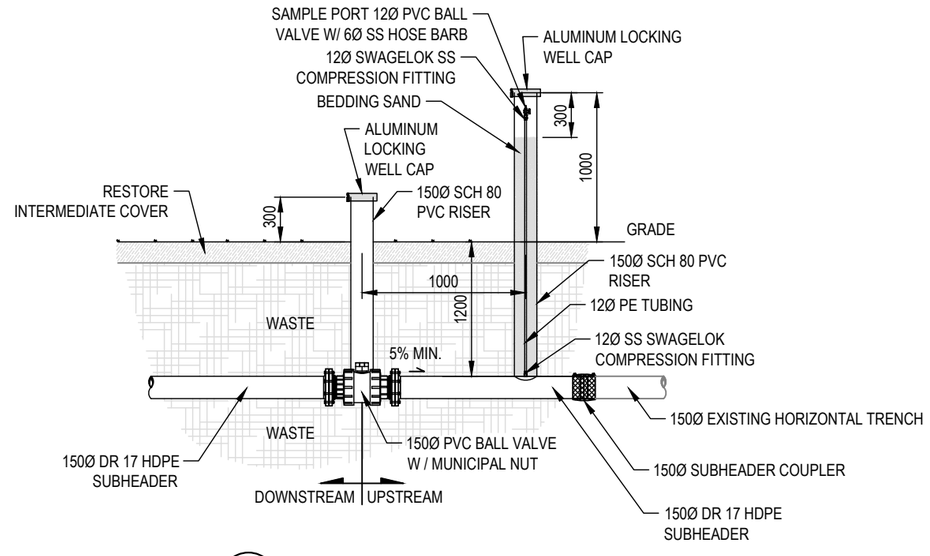
1 C203 N.T.S

EXISTING SUBHEADER ISOLATION VALVE AND SAMPLE PORT MODIFICATIONS



2 C203 N.T.S

150Ø SUBHEADER ISOLATION VALVE AND SAMPLE PORT



3 C203 N.T.S

150Ø HORIZONTAL TRENCH ISOLATION VALVE AND SAMPLE PORT

NOTES: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED.

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JULY 10/20	ML	ISSUED FOR TENDER
A	JUNE 2020	ML	ISSUED FOR REVIEW - 90%
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

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REGIONAL DISTRICT of Fraser-Fort George

TETRA TECH

LFG WELLFIELD EXPANSION
FOOTHILLS BOULEVARD REGIONAL LANDFILL

DETAILS - PIPEWORKS 2

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04251-01	EDM	ML	ML	-	**C203**
DATE: July 2020	SHEET No. 5 of 5	DWN JL/RM	APP ML	STATUS B	

APPENDIX C - CONTRACT AGREEMENT AND GENERAL CONDITIONS

APPENDIX D - SUPPLEMENTAL GENERAL CONDITIONS

REGIONAL DISTRICT OF FRASER-FORT GEORGE

2020 LANDFILL GAS WELL FIELD EXPANSION
CONSTRUCTION PROJECT

FOOTHILLS BOULEVARD REGIONAL LANDFILL
PRINCE GEORGE, BRITISH COLUMBIA

SUPPLEMENTARY GENERAL CONDITIONS

SGC 1 General

.1 These Supplementary General Conditions modify, delete or add to the General Conditions of the Contract. In the event of a conflict between the General Conditions and the Supplementary General Conditions, the Supplementary General Conditions take precedence. Clauses of the General Conditions that have not been specifically modified shall remain in effect.

SGC 2 Definitions

.1 Owner - means the Regional District of Fraser-Fort George.

.2 Engineer or Consultant - means Tetra Tech Canada Inc.

SGC 3 Documents

.1 In addition to the signed copy of the contract, the Owner shall furnish to the Contractor, without charge, three (3) copies of the drawings and specifications.

SGC 4 Time is of the Essence

.1 Time is of the essence in the performance of this Contract. In the event of schedule delay greater than one week, as determined by the Engineer, the Owner shall have the right to require the Contractor:

.1 To increase the manpower or have existing manpower work overtime for work done by his own forces or for work done by his Subcontractor to complete the work on schedule, at the Contractor’s expense;

.2 To arrange for the work of his suppliers to be accelerated through an increase in manpower or through overtime work, or both, or pay additional premiums as necessary to have manufactured components arrive and be installed at the site on schedule, at the Contractor’s expense;

.3 To remove the Subcontractor that is the cause of the delay and replace with another Subcontractor acceptable to the Owner;

.4 To provide additional supervision as necessary.

.2 The Contractor shall comply with such direction and shall bear any additional costs associated by compliance.

.3 The provision of such direction to take corrective action shall not diminish the Owner's rights and remedies under other provisions of the Contract.

SGC 5 Work Schedule

.1 At the time of Tender, the Contractor shall indicate that it can complete the work on or before the completion date indicated. Following the Contract Award, a detailed schedule as per GENERAL REQUIREMENTS Section 01 11 00.1.10 of the specifications shall be provided to the Consultant.

SGC 6 Documents

.1 The specifications are arranged in Divisions and Sections for convenience and clarity only. The Contractor is responsible for all work required to complete the contract. Such divisions and sections do not obligate the Owner or Consultant to establish limits of any contract between the Contractor and any Subcontractor.

.2 The intention and meaning of specifications and drawings are to be taken as a whole. The work shown on the drawings, if not fully described in specifications, or vice versa, which is reasonably implied and is evidently necessary for the complete finish of each branch of the work, is to be done by the Contractor as though both shown and specified.

SGC 7 Statutory Declaration

.1 The Contractor shall, prior to receiving payment on each progress certificate except the first one, provide to the Owner a Statutory Declaration stating that all employees, sub contractors and suppliers used in connection with the work have been fully paid and satisfied and there is no claim outstanding or pending in respect of the work carried out and that no lien has been filed against the Owner's lands or against any materials or equipment for work done or materials supplied under the Contract.

SGC 8 Payment

.1 The Owner shall make payment to the Contractor no later than thirty (30) days after the issuance of a certificate of payment by the Engineer.