REGIONAL DISTRICT
of Fraser-Fort George

INVITATION TO TENDER
ES-20-18

TABOR LAKE LAGOON
EMBANKMENT REHABILITATION

Date Issued:	August 6, 2020
Closing Location:	Regional District Office 3rd Floor, 155 George Street, Prince George, BC V2L 1P8
Closing Date and Time:	**Monday, August 24, 2020** **10:00 am (Pacific Standard Time)** **No Public Opening**
General Inquiries:	Email Bryan Boyes at bboyes@rdffg.bc.ca
Technical Inquiries:	Email Julian Haysom at julian.haysom@wsp.com
Note:	Late submissions will not be considered

WSP Canada Group Ltd
780 – 3rd Avenue
Prince George, BC V2L 3C5
Telephone: 250-561-4704

Regional District of Fraser-Fort George
155 George Street
Prince George BC V2L 1P8
Telephone 250-960-4400 / Toll Free 1-800-667-1959 /
Fax 250-562-8676
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1.0 INVITATION AND INSTRUCTIONS

The Regional District of Fraser-Fort George (Regional District) invites tenders for the construction of Embankment Rehabilitation at one of the Tabor Lake Community Sewer System lagoons, at Tabor Lake, BC. The work generally comprises the following:

1. Site preparation including approximately 180 m of fence relocation and 500 m^3 of stripping and stockpiling;
2. Supply, place, compact and trim approximately 2,200 m^3 of approved clay;
3. Replace approximately 2,500 m^2 of stockpile stripping and then hydroseed.

1.1 Introduction and Background

The lagoon to be rehabilitated is the treatment end of the Tabor Lake Community Sewer System, servicing "The Sons of Norway" residential subdivision, east of Prince George, BC. The lagoon is on north side of Tabor Lake, and on the east side of Valhalla Road.

The treatment system consists of a facultative sewage lagoon and a storage cell constructed from clay berms. The site slopes gently downhill from north to south; the berms and surrounding area are covered with grass and bounded by woods. The site is accessed by a gravel road off Valhalla Road. The site access road terminates on the north side of the lagoon; the construction area is on the south side of the lagoon. There are residences immediately to the south of the lagoon.

The south side of the lagoon was either never constructed to the correct elevation or settled after construction. Consequently, because of the requirement for a one metre freeboard, the capacity of the lagoon is reduced, and development is being curtailed.

The lagoon water level is controlled by an irrigation system that distributes water from the storage cell to the east side of the lagoon during the summer. The water is conveyed, via a pump-house and suction hose on the north side of the lagoon.

The irrigation system will be operational during the contract. Coordination with the operator for site access, crossing hoses and the like will be required.

1.2 Purpose

The purpose of this project is to restore the treatment volume of the storage lagoon by increasing the height of the embankment around the low section of the embankment to its original design level.

1.3 Tender Documents

Tender documents may be obtained on, or after, **Thursday, August 6, 2020**:

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 ($50) (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. A complete set of construction drawings for the entire project are included with the tender package.

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:

Bryan Boyes, Utilities Leader
Regional District of Fraser-Fort George
155 George Street
Prince George, BC V2L 1P8
Phone: 250-960-4400 / Fax: 250-562-8676
Email: bboyes@rdffg.bc.ca

Technical Inquiries:

Julian Haysom, P.Eng.
WSP Canada Group Ltd.
780 3rd Avenue
Prince George, BC V2L 3C5
Phone: (250) 561-4704 / Cell :(250) 640-3730
Email: julian.haysom@wsp.com

1.4 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 10:00 a.m. (local time) on Monday, August 24, 2020.

Four (4) 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-20-18
   Tabor Lake Lagoon Embankment Rehabilitation

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.

1.5 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 Bryan Boyes, Utilities Leader, at bboyes@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.

1.6 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 29).

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.

1.7 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.

1.8 Proof of Ability

Tenderers will be competent in the field of municipal infrastructure works and capable of performing the work. 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.

1.9 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.

1.10 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 Bryan Boyes, bboyes@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, August 19, 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 August 19, 2020, should changes be necessary to the work of this ITT, they will be addressed through Article 12.0, Changes to the Contract Work.

1.11 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.

1.12 Site Location and Facility Information

The Site is located in Northern British Columbia, approximately 15 km east of Prince George, off Highway 16 – right on Stewart Rd, right on Giscome Rd and left on Valhalla Rd.

2.0 TENDER FORMAT

Tenderers are asked to respond in the manner outlined below and submit **four (4) 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 21 through 29:

- 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
- 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 ES-20-18. 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	20%
(b)	Acceptability of reference checks	15%
(c)	Preliminary Construction Schedule	15%
(d)	Price	50%
	TOTAL	100%

Price evaluation shall include the sum of the "Schedule of Prices" as per the "Tender Form Summary".

The Contractor will have seven (7) 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 MMCD Unit Price Contract.

4.2 Award of Contract

A contract for ES-20-18 Tabor Lake Lagoon Embankment Rehabilitation is anticipated to be awarded at Regional Board on September 17, 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-20-18 Tabor Lake Lagoon Embankment Rehabilitation, 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 28, 2020 at 12:01 a.m. and the Contract will remain in force until midnight on November 27, 2020. 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 27, 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 SECURITY DEPOSIT

A certified cheque, bank draft or money order in the amount of Ten Thousand Dollars ($10,000) in Canadian funds must accompany the Tender. This security deposit will be returned to all unsuccessful bidders within sixty (60) days of Tender opening and to the successful bidder when a contract has been executed. Failure of the successful bidder to execute the contract upon award by the Regional Board will result in forfeiture of the Ten Thousand Dollars ($10,000) Security Deposit.

10.0 BID PRICES

Tender prices must remain open for acceptance for a period of sixty (60) days from the time of Tender opening (Monday, August 24, 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.

11.0 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.

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 Consultant and the Contractor.

If, in the opinion of the Regional District, such changes affect the Contract amount, these will be adjusted at the time of ordering the changes. The value of the addition or deduction from the Contract amount will be decided by the Regional District based on a lump sum estimate submitted by the Contractor and accepted by the Regional District.

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.

iv. The Contractor will buy and keep in force at their expense until completion of the Contract, firefighting expense insurance in the amount of Five Hundred Thousand Dollars ($500,000). Such insurance is to include forestry firefighting expenses and will be in the name of the Contractor and the Regional District.

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 11 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 Tabor Lake Lagoon Embankment Rehabilitation Project, 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, 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. Site preparation including approximately 180m of fence relocation and 500 m^3 of stripping and stockpiling;
2. Supply, place, compact and trim approximately 2,200 m^3 of approved clay;
3. Replace approximately 2,500 m^2 of stockpile stripping and then hydroseed.

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 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 MMCD, which will form part of the final contract)
- Appendix D – Supplemental General Conditions

ACKNOWLEDGEMENT LETTER

The undersigned has received a full set of ITT ES-20-18 – Tabor Lake Lagoon Embankment Rehabilitation 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:

Bryan Boyes, Utilities Leader
Regional District of Fraser-Fort George
155 George Street
Prince George, BC V2L 1P8
Telephone: 250-960-4400
Fax: 250-562-8676

Email: bboyes@rdffg.bc.ca

TENDERER CHECKLIST

Before submitting your Tender, check the following points:

- ☐ Have you submitted the Acknowledgement Letter?
- ☐ Has the Tender Form been signed and witnessed?
- ☐ Has the Security Deposit been included?
- ☐ Has the Tender Form Summary been completed?
- ☐ Has the Schedule of 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 four (4) 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.

Four (4) complete copies of your Tender must be submitted by 10:00am on August 24, 2020 in a sealed envelope with the following information clearly marked 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-20-18
  Tabor Lake Lagoon
  Embankment Rehabilitation

- ☐ 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, Security Deposit, 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 seven (7) 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 security deposit in the amount of Ten Thousand Dollars ($10,000).

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)
Section 1 – General Contract Requirements	$_____
Section 2 – Site Preparation	$_____
Section 3 – Site Works	$_____
TENDER PRICE – Excluding GST	$_____
GST as applicable	$_____
TOTAL TENDER PRICE – INCLUDING GST	$_____

SCHEDULE OF PRICES

SECTION 1 – GENERAL CONTRACT REQUIREMENTS

ITEM NO.	MMCD REF.	DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT (excluding GST)
1.0		Mobilization & Demobilization	L.S.	1		$
1.1		Insurance, Bonding, Safety Program, Environmental Protection, Temporary Facilities, Record Documents, etc.	L.S.	1		$
1.2		Materials Testing and QA/QC	L.S.	1		$

Subtotal General Requirements $ _____

SECTION 2 – SITE PREPARATION

ITEM NO.	MMCD REF.	DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT (excluding GST)
2.0		Remove fencing (and later reinstatement)	l.m.	180		$
2.1		Remove signage (and later reinstatement)	ea.	3		$
2.2		Exploratory Test Pits	ea.	3		$

Subtotal Site Preparation $ _____

SECTION 3 – SITE WORKS

ITEM NO.	MMCD REF.	DESCRIPTION	UNIT	QTY.	UNIT PRICE	AMOUNT (excluding GST)
3.1		Grub, strip and stockpile for later re-use	m^3	500		
3.2		Supply, place, compact and trim imported clay c/w step excavations into bank	m^3	2,200		
3.3		New post and wire net fence c/w barbed wire top	l.m.	20		
3.4		Spread stockpiled stripping c/w hydro-Seed	m^2	2,500		

Subtotal Site Works $ _____

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.

Legal 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-20-18 Tabor Lake Lagoon
Embankment Rehabilitation

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 MMCD which will form part of the final contract)
- Appendix D – Supplemental General Conditions

APPENDIX A - SPECIFICATIONS

REGIONAL DISTRICT
of Fraser-Fort George

ITT ES-20-18

TABOR LAKE LAGOON EMBANKMENT REHABILITATION

APPENDIX A

Technical Specifications

Specifications and Applicable MMCD Documents

1. General

1.1 Description

.1 This section specifies, by listing them those Sections of the MMCD which apply to this project. The Contractor shall obtain its own copy of the MMCD document.

.2 Section numbers below marked with an "A" are additional sections, new to the MMCD document and those marked with an "S" are supplementary to the noted MMCD specification section.

1.2 Applicable Sections

Division		Reference	Section Title
	GENERAL CONDITIONS		
01	GENERAL REQUIREMENTS		
		01 33 01	Project Record Documents
		01 42 00	Reference Specifications - Site and Infrastructure
		01 53 01	Temporary Facilities
		01 55 00	Traffic Control, Vehicle Access and Parking
		01 57 01	Environmental Protection
31	EARTHWORKS		
		31 05 17 A	Clay Material (Additional Spec – not MMCD)
		31 11 01	Clearing and Grubbing
		31 11 41	Shrub and Tree Preservation
		31 22 01	Site Grading
		31 23 01	Excavating, Trenching and Backfilling
		31 24 13	Roadway Excavation, Embankment & Compaction
		31 24 13 S	Supplementary
32	ROADS AND SITE IMPROVEMENTS		
		32 31 13 A	Fence (Additional Spec – not MMCD)
		32 91 21	Topsoil and Finish Grading
		32 92 19	Hydraulic Seeding
		32 92 19 S	Supplementary

1.3 Applicable Standard Drawings

Div	Dwg. #	Drawing Title

No MMCD Standard Drawings apply to this project

2. Products

.1 Not used.

3. Execution

.1 Not used.

End Of Section

1.0 GENERAL

.1 Section 31 05 17 A addresses requirements for the clay material to be supplied under this contract. This section must be referenced to and interpreted simultaneously with the contract drawings and all other sections pertinent to the works described herein.

.2 Install clay material in accordance with Section 31 24 13 and Section 31 24 13 S.

1.1 Section Includes

.1 Imported Clay Material as described herein.

1.2 Payment

.1 Payment for the work performed under this Section will not be paid for separately and will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.

2.0 PRODUCTS

2.1 Clay Material

.1 At least one week in advance of commencement of construction, provide a testing report from the Contractor's material testing company that the supplied material meets the following specifications. Provide additional reports if the material source changes during the contract.

.2 Cohesive soils must be free from organic, frozen, or other deleterious material. Any particles greater than 75 mm must be removed prior to compaction.

.3 Clay properties

- Permeability k: less than 1×10^{-6} m/s
- % fines: greater than 30%
- Liquid Limit: greater than 30%
- Plasticity Index: greater than 15%

.4 Provide a Proctor report for the clay, establishing the Standard Proctor Maximum Dry Density (SPMDD). Supply the clay material with the optimum moisture content within +/- 2% of the SPMDD. Clays with the OMC outside this range may be wetted/dried on site, using the Contractor's own methods.

3.0 EXECUTION

3.1 Execution

.1 Supply and install in accordance with Section 31 24 13 and Section 31 24 13 S Roadway Excavation, Embankment and Compaction

**** END SECTION 31 05 17 A ****

1.0 GENERAL

.1 While the title of this section is Roadway Excavation, Embankment and Compaction, there is no roadway as such. However, the individual clay lifts are deemed equivalent to a roadway for the purposes of this section.

.2 Section 31 24 13 S is supplementary to the MMCD standard specification and addresses requirements for the preparation of, placement and compaction of the clay material supplied under this contract to raise the level of a section of the existing embankment of the wastewater lagoon. This section must be referenced to and interpreted simultaneously with the contract drawings and all other sections pertinent to the works described herein.

.3 Supply the clay material in accordance with Section 31 05 17 A.

1.1 Section Includes

.1 Preparation for, placement of the imported clay material and final dressing as described herein.

1.2 Payment

.1 Payment for the work performed under this Section is set out in the Measurement and Payment section of the Supplementary General Conditions of Contract in Appendix D.

2.0 PRODUCTS **AS SET OUT IN SECTION 31 05 17 A**

3.0 EXECUTION

3.1 Compaction Testing

.1 Retain the services of an Independent Inspection/Testing Agency, acceptable to the Contract Administrator, for the purpose of inspecting and/or testing portions of the Work. Provide the results of independent testing to the Contract Administrator as they become available. In addition to the specified tests for installed materials, provide also for 3rd party geotechnical inspection of imported clay backfilling and compaction for berm re-construction.

.2 Provide compaction testing results for every second lift of clay and four tests per lift, taken at different places around the completed lift.

3.2 Compaction

Equipment

.1 The recommended compaction equipment for compacting cohesive soils is a sheepsfoot or pad foot roller. Cohesive soils should be spread by a motor grader to obtain uniform lift thicknesses.

3.3 Preparation

.1 Remove and store the fence in the work area for later reinstallation.

.2 Clear, grub and strip the area of work, as provided for in Sections 31 11 01 and 31 22 01.

.3 At least two days prior to commencement of the embankment construction/addition, dig three exploratory trenches as shown on the drawings. These trenches shall be constructed in accordance with Section 31 23 01. These trenches shall be constructed in the presence of the Geotechnical engineer and coordinated with him. The identified locations, depth and length of the trenches may vary, as decided by the Geotechnical engineer, depending on findings. Allow for 40% variation in the indicated length, width and depth to provide for possible varying site conditions.

3.4 Clay Placement

.1 Start at the bottom and work upwards, placing the clay layers at right-angles to the existing embankment contour in uniform lifts, all the way around the perimeter of the existing embankment so that there is one continuous layer in one lift.

.2 Place the clay in layers roughly 250mm in compacted thickness. To knit the new and existing surfaces together, carefully remove a roughly 250mm thick layer from the existing embankment (can be re-used); as the existing embankment slope is roughly 2H:1V, the cut into the embankment will have to be roughly 500mm in horizontal width. The overall horizontal width of the layer must be roughly 20% greater than that of a standard roller width, or roughly 2.5m outwards from the existing embankment.

.3 It is expected that a sheepsfoot roller will be necessary to achieve the desired compaction throughout the height of the lift. In the expectation that the length of a single tine on a sheepsfoot roller is 275mm long, the compactive depth will be about least 25 mm more than the clay lift. The foot of the roller should penetrate into the previous layer.

.4 Compact the clay to within 95% of Standard Proctor Maximum Dry Density (SPMDD) at +/- 2% of optimum water content.

.5 Rollers may be ballasted to increase compaction effort if required to achieve the specified density.

.6 If the moisture content of the soil is too high the material should be spread and thoroughly worked until the optimum moisture content is achieved. Discing and mixing with drier materials are suitable methods for reducing the moisture content.

.7 If the moisture content of the material is too low, the material should be disced and broken down, water added as required and the material thoroughly worked to mix the water throughout the material prior to commencing compaction operations. Dry material may also be mixed with wetter material to increase the moisture content.

.8 If, prior to placing subsequent lifts of material, the compacted surface is too hard for the compaction equipment to penetrate the previous surface, it should be scarified or disced.

.9 If prior to placing subsequent lifts of material the compacted surface is too wet the affected material should be removed and replaced with new material and then recompacted.

3.5 Finishing

.1 Finish the top of the newly constructed embankment uniformly flat all the way around (with the final elevation shown on the drawings), prior to the stripping stockpile re-use. Feather the top elevation of the new embankment into the existing embankment at the ends of the work.

.2 As the clay layers are stepped inwards with the slope of the existing embankment, so steps will be formed on the outside face. Trim the outside face of the embankment to provide a neat uniform appearance. Trimmed clay should be worked into the finished surface.

.3 Place and tamp (not compact) stockpiled topsoil into the outside and top of the embankment and hydroseed.

**** END SECTION 31 24 13 S ****

1.0 GENERAL

.1 Section 32 31 13 A addresses requirements for the removal and reinstatement of the existing fence and for the supply and installation of new fence, where there is a deficit. This section must be referenced to and interpreted simultaneously with the contract drawings and all other sections pertinent to the works described herein.

1.1 Section Includes

.1 Removal and Replacement of existing fence.
.2 Supply and installation of new fence.

1.2 Payment

.1 Payment for the work performed under this Section is set out in the Measurement and Payment section of the Supplementary General Conditions of Contract in Appendix D.

2.0 PRODUCTS

2.1 Existing Fence

.1 The materials of the existing fence shall be recovered and reused in their as-is condition.

2.2 New Fence

Material for the new fence includes

.1 Single strand barbed wire for the top of the fence
.2 Nominal DN100 x 2.5m long pressure treated wooden fence posts
.3 1.5m high galvanized or zinc coated, grid wire fence mesh with maximum 100mm x 100mm opening and minimum 2.5mm (10gauge) wire.
.4 Galvanized U-spike fasteners

3.0 EXECUTION

3.1 Execution

.1 Snip the strands of the existing grid-wire fence at a convenient fence post on each end of the work area – the 'snip posts'. Neatly remove the existing grid-wire fence and barbed wire from the existing fence posts and roll-up and store for later reuse. Carefully remove the fence posts and set aside for later reuse.
.2 On completion of the embankment construction work, re-install the existing fence at the top of the outside edge of the berm to the same standard as the as-found construction. Start the fence replacement at one of the 'snip posts' by using the U-spikes to start the fence, which will provide an apparently continuous fence line.

Provide additional spikes as required for added support to both the existing and replaced fence. Ensure the posts are plumb and that the tops of the posts are level with all the others. Install the fence fabric so that it is taught and that there are no gaps under the fence.

.3 Where there is a deficiency of fencing, due to the increased length of the embankment, install new fence. Drive new fence posts approximately 1m into the ground, plumb and level with all other fence posts and on 2.5m centres. Fasten the grid-wire fence to the new posts at each strand using the U-spikes, and the barbed wire to the top of the post. Install the fence fabric so that it is taught and that there are no gaps under the fence. Finish the new fence at the other 'snip post' in the same manner as the existing fence in .2 above.

**** END SECTION 32 31 13 A ****

1.0 GENERAL

.1 Section 32 92 19 S is a supplementary section to 32 92 19 to specify the hydraulic seed mix. This section must be referenced to and interpreted simultaneously with the contract drawings and all other sections pertinent to the works described herein.

.2 Supplying and placing topsoil is not included in the work of this contract.

1.1 Section Includes

.1 Seed and Fertilizer mix and application rate.

1.2 Payment

.1 Payment for the work performed under this Section is set out in the Measurement and Payment section of the Supplementary General Conditions of Contract in Appendix D.

2.0 PRODUCTS

To Section 32 92 19 of the MMCD standard specification add item .6, as follows:

2.1 Grass Seed

.1 Provide the North East General Seed Mix (by weight) for revegetation as per Section 757 in the 2012 Standard Specifications for Highway Construction, blended for a hydroseed application.

.2 Seed Mix:

Tall Fescue	20%
Perennial Ryegrass	20%
Creeping Red Fescue	20%
Timothy	15%
Alfalfa	15%
Alsike Clover	10%

Seed Mix Application Rate: 75kg/ha

.3 Fertilizer:
N-P-K: 26%-16%-8%

Fertilizer Application Rate: 300kg/ha

3.0 EXECUTION NOT AMENDED

**** END SECTION 32 92 19 S ****

1.0 GENERAL

.1 Section 01 33 01 addresses general requirements for submittal of record information, operating and maintenance manuals. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Section Includes

.1 Record documents, samples, specifications.

.2 Equipment and systems manuals.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data and instructions.

1.2 Related Sections

.1 Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.3 Submission

.1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.

.2 Submit one copy of completed volumes in final form 15 days prior to date of Total Performance.

.3 Copy will be returned within 15 days after date of Total Performance, with Contract Administrator's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks after receipt of Contract Administrator's comments submit to Contract Administrator, three final copies of operating and maintenance manuals.

1.4 Format

.1 Organize data in form of instructional manual.

.2 Use binders: 3-ring, hard cover for equipment and systems manuals, product data and related information.

.3 When multiple binders are used, correlate data into related consistent groupings.

.4 Cover: Identify each binder with printed title; list title of Project, identify subject matter of contents.

.5 Include Table of Contents.

.6 Provide tabbed fly leaf for each separate section.

.7 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.5 Contents, Each Volume

.1 Table of Contents: provide title of project; names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume

.2 For each product or system: 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 clearly 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.

.5 Typewritten text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.6 Record Documents and Samples

.1 Maintain at site for Contract Administrator one record copy of all Contract Documents including:

.1 Contract Drawings.

.2 Specifications.

.3 Field Memos.

.4 Addenda.

.5 Change Orders.

.6 Reviewed shop drawings, product data, and samples.

.7 Field test records.

.8 Inspection certificates.

.9 Manufacturer's certificates.

.2 Store record documents and samples in site office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label and file in accordance with relevant Section number. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain Record Documents in a clean, dry and legible condition. Do not use Record Documents for construction purposes.

.5 Keep Record Documents and samples available for inspection by Contract Administrator.

1.7 Recording Actual Site Conditions

.1 Record information concurrently with construction progress. Do not conceal work until required information is recorded.

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

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

.2 Field changes of dimension and detail.

.3 Changes made by Addenda and Change Orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

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

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

.2 Changes made by Addenda and Change Orders.

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

1.8 Payment

.1 Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

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END OF SECTION 01 33 01

1.0 GENERAL

.1 The Master Municipal Specifications contain references to standard specifications for testing, materials, manufacturing and installation procedures. These references have been abbreviated to identify only the referenced Association and specification designation. This Section provides the full descriptive title of each referenced specification.

.2 When references to capitalized abbreviations are made, they refer to Specifications, Standards, or Methods of the respective Association. Abbreviations listed herein but not mentioned in the Specifications shall be disregarded.

.3 The numbers and letters following the abbreviations denote the Association's serial designation for the Specification or Standard to which reference is made.

.4 All references to these Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments.

.5 The specifications and standards published by these organizations and other specified specifications and standards referred to in the Master Municipal Specifications are hereby made part of the Master Municipal Specifications as far as they are applicable to and not inconsistent with the Master Municipal Specifications.

1.1 Nomenclature

.1	**AAFC**	Agriculture and Agri-Food Canada
.2	**AASHTO**	American Association of State Highway and Transportation Officials
.3	**ACI**	American Concrete Institute.
.4	**AI**	Asphalt Institute.
.5	**ANSI**	American National Standards Institute.
.6	**ASTM**	ASTM International formerly known as American Society for Testing and Materials
.7	**AWG**	American Wire Gauge.
.8	**AWWA**	American Water Works Association.
.9	**BCLNA**	BC Landscape and Nursery Association
.10	**CAN**	Prefix signifying endorsement of other current standard as a Canadian National Standard.
.11	**BCMOT E&SMS V1**	BC Ministry of Transportation Electrical and Sign Material Specification Volume 1.
.12	**CCIL**	Canadian Council of Independent Laboratories.
.13	**CCTV**	Closed Circuit Television.
.14	**CEC**	Canadian Electrical Code.
.15	**CGSB**	Canadian General Standards Board.
.16	**CSA**	Canadian Standards Association.
.17	**CAN3 = CAN/CSA**	
.18	**C-SHRP**	Canadian Strategic Highway Research Program.
.19	**IMSA**	International Municipal Signal Association.
.20	**JPEG**	Joint Photographic Experts Group.
.21	**LCD**	Liquid Crystal Display.
.22	**LED**	Light Emitting Diode.
.23	**MPEG-2**	Moving Picture Experts Group standard for transmitting digital video and sound in a compressed format.
.24	**MSCC**	Manual of Sewer Condition Classification, Third Edition, 1993 including Addendum - February 1996.
.25	**MUTCDC**	Manual of Uniform Traffic Control Devices of Canada
.26	**NAAPI**	North American Association of Pipeline Inspectors
.27	**NACE**	National Association of Corrosion Engineers
.28	**NASSCO**	National Association of Sewer Service Companies
.29	**NCHRP**	National Cooperative Highway Research Program
.30	**NEMA**	National Electrical Manufacturers Associations
.31	**WRc**	Water Research Centre.

1.2 Referenced Specifications

.1 ACI

.1	ACI 315R	Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 AI

.1		Asphalt Institute Manual SP-2 Superpave Level 1 Mix Design.

.3 ANSI

.1	ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.
.2	ANSI B16.5	Pipe Flanges and Flanged Fittings.

.4 ANSI/ACI

.1	ANSI/ACI 117	Tolerances for Concrete Construction and Materials.
.2	ANSI/ACI 315	Details and Detailing of Concrete Reinforcement.

.5 ANSI/AWWA

.1	ANSI/AWWA C151	Ductile-Iron Pipe, Centrifugally Cast, for Water.
.2	ANSI/AWWA C219	Bolted, Sleeve-Type Couplings for Plain-end Pipe.
.3	ANSI/AWWA C213	Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
.4	ANSI/AWWA B300	Hypochlorites
.5	ANSI/AWWA C300	Reinforced Concrete Pressure Pipe - Steel-cylinder Type.
.6	ANSI/AWWA B301	Water Treatment – Liquid Chlorine.
.7	ANSI/AWWA C104/A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
.8	ANSI/AWWA C105/A21.5	Polyethylene encasement for Ductile-Iron Piping for Water and Other Liquids.
.9	ANSI/AWWA C110/A21.10	Ductile-Iron and Gray Iron Fittings, 3 inches through 48 inches for Water and Other Liquids.
.10	ANSI/AWWA C111/A21.11	Rubber Gasket Joints for Ductile-Iron and Gray Iron Pressure Pipe and Fittings.
.11	ANSI/AWWA C150	Thickness Design of Ductile - Iron Pipe.
.12	ANSI/AWWA C151/A21.51	Ductile-Iron Pipe, Centrifugally Cast in Metal Moulds or Sand Lined Moulds for Water or other Liquids.
.13	ANSI/AWWA C153/A21.53	Ductile-Iron Compact Fittings, 3 inches through 16 inches, for Water and Other Liquids.
.14	ANSI/AWWA C200	Water Pipe 6 inches and Larger, Steel.
.15	ANSI/AWWA C203	Coal Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
.16	ANSI/AWWA C205	Cement Mortar Protective Lining and Coating for Steel Water Pipe - 4 inches and larger - Shop Applied.
.17	ANSI/AWWA C206	Field Welding of Steel Water Pipe.
.18	ANSI/AWWA C207	Steel Pipe Flanges for Waterworks Service, 4 inches through 144 inches.
.19	ANSI/AWWA C208	Fabricated Steel Water Pipe Fittings, Dimensions for.
.20	ANSI/AWWA C210	Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

.21	ANSI/AWWA C301	Pre-stressed Concrete Pressure Pipe Steel Cylinder Type for Water and Other Liquids.
.22	ANSI/AWWA C303	Reinforced Concrete Pressure Pipe Steel Cylinder Type, Pretensioned for Water and Other Liquids.
.23	ANSI/AWWA C500	Gate Valves for Water and Sewage Systems.
.24	ANSI/AWWA C502	Dry-Barrel Fire Hydrants.
.25	ANSI/AWWA C504	Butterfly Valves.
.26	ANSI/AWWA C508	Swing-Check Valves for Waterworks Service, 2 in. (50mm) Through 24 in. (600mm) NPS.
.27	ANSI/AWWA C509	Resilent-Seated Gate Valves for Water and Sewerage Systems.
.28	ANSI/AWWA C510	Double Check Valve Backflow-Prevention Assembly.
.29	ANSI/AWWA C511	Reduced-Pressure Principle Backflow-Prevention Assembly.
.30	ANSI/AWWA C512	Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
.31	ANSI/AWWA C550	Protective Epoxy Interior Coatings for Valves and Hydrants.
.32	ANSI/AWWA C600	Installation of Ductile-Iron Water Mains, and their Appurtenances.
.33	ANSI/AWWA C602	Cement Mortar Lining of Water Pipelines - 100 mm and larger - In Place.
.34	ANSI/AWWA C605	Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
.35	ANSI/AWWA C651	Disinfecting Watermains.
.36	ANSI/AWWA C800	Underground Service Line Valves and Fittings.
.37	ANSI/AWWA C900	Pressure Pipe, 4 inches through 12 inches for Water, Polyvinyl Chloride (PVC).
.38	ANSI/AWWA C901	Polyethylene (PE) Pressure Pipe and Tubing, ½ inch through 3 inches for Water Service.
.39	ANSI/AWWA C902	Polybutylene (PB) Pressure Pipe and Tubing, ½ inch through 3 inches for Water Service.
.40	ANSI/AWWA C905	Pressure Pipe, 14 inches through 36 inches for Water, Polyvinyl Chloride (PVC).
.41	ANSI/AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings, 4 inches through 63 inches, for Water Distribution.
.42	ANSI/AWWA C907	Standard for Polyvinyl Chloride (PVC) Pressure Fittings for Water - 4 inches through 8 inches (100mm through 200mm).
.43	ANSI/AWWA M17	Installation, Field Testing, and Maintenance of Fire Hydrants.
.44	ANSI/AWWA M23	PVC Pipe - Design and Installation.
.45	ANSI/AWWA M41	Ductile-Iron Pipe and Fittings.

.6 ASTM (A)

.1	ASTM A36	Standard Specification for Structural Steel.
.2	ASTM A48	Specification for Gray Iron Castings.
.3	ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
.4	ASTM A90	Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
.5	ASTM A120	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.

.6	ASTM A121	Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
.7	ASTM A283/A283M	Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
.8	ASTM A307	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
.9	ASTM A325	Standard Specification for High-Strength Bolts for Structural Steel Joints.
.10	ASTM A354	Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
.11	ASTM A536	Ductile Iron Castings.
.12	ASTM A585	Specification for Aluminum-Coated Steel Barbed Wire.
.13	ASTM A563	Carbon and Alloy Steel Nuts.
.14	ASTM A615M	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
.15	ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.16	ASTM A716	Specification for Ductile - Iron Culvert Pipe.
.17	ASTM A746	Specification for Ductile - Iron Gravity Sewer Pipe.
.18	ASTM A760	Corrugated Steel Pipe, Metallic-coated for Sewers and Drains.
.19	ASTM A775/A775M	Specification for Epoxy-Coated Reinforcing Steel Bars.

.7 ASTM (B)

.1	ASTM B62	Specification for Composition Bronze or Ounce Metal Castings.
.2	ASTM B88M	Specification for Seamless Copper Water Tube.
.3	ASTM B221M	Specifications for Aluminium and Aluminium-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
.4	ASTM B633	Electodeposited Coatings of Zinc on Iron and Steel.
.5	ASTM B766	Electodeposited Coatings of Cadmium.

.8 ASTM (C)

.1	ASTM C14M	Specification for Concrete Sewer, Storm Drain and Culvert Pipe
.2	ASTM C76M	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
.3	ASTM C88	Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
.4	ASTM C109	Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inches or 50 mm Cube Specimens).
.5	ASTM C117	Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
.6	ASTM C123	Test Method for Lightweight Pieces in Aggregate.
.7	ASTM C127	Test Method for Specific Gravity and Absorption of Coarse Aggregate.
.8	ASTM C128	Test Method for Specific Gravity and Absorption of Fine Aggregate.
.9	ASTM C131	Test Method for Resistance to Degradation of Small Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
.10	ASTM C136	Method for Sieve Analysis of Fine and Coarse Aggregates.
.11	ASTM C139	Specification for Concrete Masonry Units for Construction of Catchbasins and Manholes.

.12	ASTM C171	Specification for Sheet Materials for Curing Concrete.
.13	ASTM C309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
.14	ASTM C332	Specification for Lightweight Aggregates for Insulating Concrete.
.15	ASTM C443M	Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
.16	ASTM C478M	Specification for Precast Reinforced Concrete Manhole Sections.
.17	ASTM C497	Test Methods for Concrete Pipe, Manhole Sections, or Tile.
.18	ASTM C506M	Specification for Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.
.19	ASTM C507M	Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe.
.20	ASTM C827	Test Method for Early Volume Change of Cementitious Mixtures.
.21	ASTM C902	Specification for Pedestrian and Light Traffic Paving Brick.
.22	ASTM C939	Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
.23	ASTM C1433	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers.
.24	ASTM C1103	Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.

.9 ASTM (D)

.1	ASTM D36	Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
.2	ASTM D140	Method for Sampling Bituminous Materials.
.3	ASTM D412	Test Method for Rubber Properties in Tension.
.4	ASTM D570	Test Method for Water Absorption of Plastics.
.5	ASTM D624-86	Test Method for Rubber Property -Tear Resistance.
.6	ASTM D698	Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 2.49 kg Rammer and 304.8 mm Drop.
.7	ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Material.
.8	ASTM D995	Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
.9	ASTM D1190	Concrete Joint Sealer, Hot-Applied Elastic Type.
.10	ASTM D1248	Specification for Polyethylene Plastics Molding and Extrusion Materials.
.11	ASTM D1557	Specification for Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10 lb (4.54 kg) Rammer and 18 inch (457 mm) Drop.
.12	ASTM D1559	Test Method Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
.13	ASTM D1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
.14	ASTM D1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
.15	ASTM D1784	Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
.16	ASTM D1862	Test Methods for Breaking Load and Elongation Textile Fabric.
.17	ASTM D2000	Classification System for Rubber Products in Automotive Applications.
.18	ASTM D2152	Test Method for Quality of Extruded Polyvinyl Chloride (PVC) Pipe by Acetone Immersion.

.19	ASTM D2241	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR).
.20	ASTM D2310	Classification for Machine Made Reinforced Thermosetting Resin Pipe.
.21	ASTM D2321-05	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-flow Applications.
.22	ASTM D2412	Standard Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading.
.23	ASTM D2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
.24	ASTM D2657	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.
.25	ASTM D2680	Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
.26	ASTM F2620-06	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
.27	ASTM D2774	Practices for Underground, Installation of Thermoplastic Pressure Piping.
.28	ASTM D2837	Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
.29	ASTM D2990	Standard Test Method for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
.30	ASTM D2992	Method for Obtaining Hydrostatic Design Basis for Reinforced Thermosetting Resin Pipe and Fittings.
.31	ASTM D2996	Specification for Filament Wound Reinforced Thermosetting Resin Pipe.
.32	ASTM D3034	Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
.33	ASTM D3035-08	Standard Specifications for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
.34	ASTM D3139	Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.
.35	ASTM D3203	Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
.36	ASTM D3212	Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomic Seals.
.37	ASTM D3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
.38	ASTM D3405	Specification for Joint Sealants, Hot Poured for Concrete and Asphalt Pavements.
.39	ASTM D3350	Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.
.40	ASTM D4101	Propylene Plastic Injection and Extrusion Materials.
.41	ASTM D4318	Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
.42	ASTM D4354	Practice for Sampling of Geosynthetics for Testing.
.43	ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
.44	ASTM D4956	Standard Specification for Retroreflective Sheeting for Traffic Control.
.45	ASTM D5813	Standard Specification for Cured-in-Place Thermosetting Resin Sewer Piping Systems.

.10 ASTM (E)

.1	ASTM E11	Specification for Wire Cloth Sieves for Testing Purposes.
.2	ASTM E1155M	Test Method for Determining Floor Flatness and Levelness Using the F-Number System.

.3	ASTM E1252	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis.

.11 ASTM (F)

.1	ASTM F436	Hardened Steel Washers.
.2	ASTM F477	Specification for Elastomeric Seals (Gaskets) for joining Plastic Pipe.
.3	ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs.
.4	ASTM F594	Stainless Steel Nuts.
.5	ASTM F679	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.
.6	ASTM F714	Standard Specifications for Polyethylene (PE) Plastic (SDR-PR) Based on Outside Diameter.
.7	ASTM F738	Stainless Steel Metric Bolts, Screws, and Studs.
.8	ASTM F794	Specification for Polyvinyl Chloride (PVC) Ribbed Gravity Sewer Pipe and Fittings based on Controlled Inside Diameter.
.9	ASTM F836M	Style 1 Stainless Steel Metric Nuts.
.10	ASTM F1055	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
.11	ASTM F1216	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
.12	ASTM F1743	Standard Practice for the Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).
.13	ASTM F2019	Standard Practice for the Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

.12 AWWA: (See ANSI/AWWA)

.13 BCLNA

BC Landscape Standard 2008 (7th Ed)

Canadian Standards For Nursery Stock – (8th Edition)

Canadian System of Soil Classification – (3rd Edition)

.14 CAN3 = CAN/CSA

.1	CAN3-A165 Series	CSA Standards on Concrete Masonry Units.
.2	CAN3-B137.3	Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications.
.3	CAN4-S543	Internal Lug, Quick-Connect Couplings for Fire Hose.
.4	CAN3-B70	Cast Iron Soil Pipe and Fittings, and Means of Joining.
.5	CAN3-G401	Corrugated Steel Pipe Products.
.6	CAN3-A23.3	Design of Concrete Structures for Buildings.

.15 CAN/CSA = CAN3

.1	CSA A3000	Portland Cement.
.2	CSA A3000	Masonry Cement.
.3	CAN/CSA-A23.1	Concrete Materials and Methods for Concrete Construction.
.4	CAN/CSA-A23.2	Methods of Testing for Concrete.
.5	CAN/CSA-A23.5	Supplementary Cementing Materials.

.6	CAN/CSA-A231.2	Precast Concrete Pavers.
.7	CAN/CSA-A266.1	Air-Entraining Admixtures for Concrete.
.8	CAN/CSA-A266.2	Chemical Admixtures for Concrete.
.9	CAN/CSA-A266.4	Guidelines for the use of Admixtures in Concrete.
.10	CSA A3000	Blending Hydraulic Cement.
.11	CSA A3000	Cementitious Hydraulic Slag.
.12	CAN/CSA-B182.1	Plastic Drain and Sewer Pipe and Pipe Fittings.
.13	CAN/CSA-B182.6M	Profile Polyolefin Sewer Pipe & Fittings.
.14	CAN/CSA-G40.21	Structural Quality Steels.

.16 CAN/CGSB

.1	CAN/CGSB-8.1	Sieves Testing, Woven Wire.
.2	CAN/CGSB-8.2	Sieves Testing, Woven Wire, Metric.
.3	CAN/CGSB-138.1	Fence, Chain Link, Fabric.
.4	CAN/CGSB-138.2	Fence, Chain Link, Framework, Zinc-Coated, Steel.
.5	CAN/CGSB-138.3	Fence, Chain Link - Installation.
.6	CAN/CGSB-138.4	Fence, Chain Link, Gates.
.7	CAN/CGSB-37.2	Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
.8	CAN/CGSB-16.1	Asphalts, Liquids Petroleum, for Road Purposes.
.9	CAN/CGSB-16.2	Asphalts, Emulsified, Anionic Type, for Road Purposes.
.10	CAN/CGSB-16.3	Asphalt Cements for Road Purposes.
.11	CAN/CGSB-16.5	Asphalt, Emulsified, High Float Type, for Road Purposes.

.17 CGSB

.1	CGSB 1-GP-12c	Standard Paint Colours.
.2	CGSB 1-GP-59M	Enamel, Exterior Gloss Alkyd Type.
.3	CGSB 1-GP-5M	Thinner, Petroleum Spirits, Low Flash (R/84).
.4	CGSB 1-GP-71	Method of Testing Paints and Pigments.
.5	CGSB 1-GP-74M	Paint, Traffic, Alkyd.
.6	CGSB 1-GP-149M	Paint, Traffic, Reflectorized Alkyd, White and Yellow.
.7	CGSB 15.1-92	Standard for Calcium Chloride.
.8	CGSB 1-GP-181M	Coating, Zinc-Rich, Organic, Ready Mixed.
.9	CGSB 51-GP-51M	Polyethylene Sheet for Using in Building Construction.
.10	CGSB 41-GP-25M	Pipe, Polyethylene, for the Transport of Liquids.

.18 CSA

.1	CSA 283	Qualification Code for Concrete Testing Laboratories
.2	CSA A14	Concrete Poles.
.3	CSA A82.5	Structural Clay Non-Load-Bearing Tile.
.4	CSA A82.56	Aggregate for Masonry Mortar.
.5	CSA A123.3	Asphalt or Tar Roofing Sheets.

.6	CSA A257	Standards for Concrete Pipe and Manhole Sections (Consists of A257.0, A257.1, A257.2, A257.3 and A257.4)
.7	CSA B137.0	Definitions, General Requirements, and Methods of Testing for Thermoplastic Pressure Piping.
.8	CSA B137.1	Polyethylene Pipe, Tubing and Fittings for cold Water Pressure Services.
.9	CSA B137.2	PVC Injection Moulded Gasketed Fittings for Pressure Applications.
.10	CSA B137.3	Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Application.
.11	CSA B137.6	CPVC Pipe, Tubing and Fittings for Hot and Cold Water Distribution Systems.
.12	CSA B137.7	Polybutylene (PB) Pipe for Cold Water Distribution Systems.
.13	CSA B137.8	Polybutylene (PB) Pipe for Pressure Applications.
.14	CSA B137.9, M91	Polyethylene / Aluminium / Polyethylene Composite Pressure Pipe.
.15	CSA B137.16	Recommended Practice for the Installation of CPVC Piping for Hot and Cold Water Distribution Systems.
.16	CSA B181.12	Recommended Practice for the Installation of PVC Drain, Waste and Vent Pipe Fittings.
.17	CSA 182.1	Plastic Drain and Sewer Pipe and Pipe Fittings.
.18	CSA B182.11	Recommended Practice for the Installation of Plastic Drain and Sewer Pipe and Pipe Fittings.
.19	CSA B182.2	Large Diameter, Type PSM PVC Sewer Pipe and Fittings.
.20	CSA B182.4	Large Diameter Ribbed PVC Sewer Pipe and Fittings.
.21	CSA C22.1	Safety Standard for Electrical Installations.
.22	CSA C22.2	Canadian Electrical Code, General Requirements.
	No 0.3	Test Methods for Electrical Wires and Cables
	No 18.1	Metallic Outlet Boxes
	No 18.4	Hardware for the Support of Conduit, Tubing and Cable
	No 29	Panelboards and Enclosed Panelboards
	No 38	Thermoset Insulated Wires and Cables
	No 42	General Use Receptacles, Attachment Plus and Similar Wiring Devices
	No 45	Rigid Metal Conduit
	No 49	Flexible Cord and Cables
	No 56	Flexible Metal conduit and Liquid Tight Flexible Metal Conduit
	No 85	Rigid PVC Boxes and Fittings
	No 89	Splitters
.23	CSA C22.3	Canadian Electrical Code Outside Wiring.
.24	CSA G30.3	Cold Drawn Steel Wire for Concrete Reinforcement.
.25	CSA G30.5	Welded Steel Wire Fabric for Concrete Reinforcement.
.26	CSA G30.12-M77	Billet-Steel Bars for Concrete Reinforcement.
.27	CSA G30.14	Deformed Steel Wire for Concrete Reinforcement.
.28	CSA G30.15	Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
.29	CSA G30.16	Weldable Low Allow Steel Deformed Bars for Concrete Reinforcement.

	.30	CSA G164	Hot Dip Galvanizing of Irregularly Shaped Articles.
	.31	CSA S157	Strength Design in Aluminium.
	.32	CSA S269.3	Formwork
	.33	CSA W59	Welded Steel Construction (Metal Arch Welding).
	.34	CSA W186	Welding of Reinforcing Bars in Reinforced Concrete Construction.
	.35	CSA G40.20	General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steels.
.19	**C-SHRP**		
	.1		Superpave Series No 2 (SP-2) Superpave Level 1 Mix Design.
	.2	Technical Brief #17	Superpave 2000 - Improved Standards for a new Millenium.
.20	**IMSA**		
	.1	50-2	Polyethylene insulated, polyethylene jacketed, loop detector lead-in cable.
.21	**NACE**		National Association of Corrosion Engineers
.22	**NEMA**		
	.1	TS-@-2003	Traffic Controller Assemblies with NTCIP Requirements, Version 02.60.
	.2	250-2003	Enclosures for Electrical Equipment (1000 Volts Maximum).
.23	**BC Ministry of Transportation Standards**		
	.1		Electrical and Signing Material Standards.
	.2		Specifications for Standard Highway Sign Materials, Fabrication and Supply.
.24	**Plastic Pipe Institute Handbook on Polyethylene Pipe**		

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END OF SECTION 01 42 00

1.0	**GENERAL**	.1	Section 01 53 01 addresses general requirements for temporary construction facilities not incorporated into the final or permanent work. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
		.2	Comply with General Conditions, Clause 4.4, Temporary Structures and Facilities.
1.1	**Section Includes**	.1	Dewatering.
		.2	Sanitary facilities.
		.3	Site Storage/Loading.
		.4	Hoarding.
1.2	**Installation and Removal**	.1	Provide temporary utilities and construction facilities in order to execute work expeditiously.
		.2	Remove from site all such work after use.
1.3	**Dewatering**	.1	Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
1.4	**Sanitary Facilities**	.1	Provide sufficient sanitary facilities for workers in accordance with local health authorities.
1.5	**Site Storage / Loading**	.1	Confine work and operations of employees in accordance with Contract Documents. Do not unreasonably encumber premises with products.
		.2	Do not load or permit to load any part of work with a weight or force that will endanger the work.
1.6	**Hoarding**	.1	Provide hoarding as shown on Contract Drawings protecting public and private property from injury or damage. Provide lockable gates within hoarding for access to site by workers and vehicles.
1.7	**Security**	.1	Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.
1.8	**First Aid Facilities**	.1	Provide adequate first aid facilities in accordance with WorkSafe BC requirements.
1.9	**Payment**	.1	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.
1.10	**Inspection and Testing**	.1	Refer to General Conditions, Clause 4.12, Inspections
2.0	**PRODUCTS**	NOT USED	
3.0	**EXECUTION**	NOT USED	

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END OF SECTION 01 53 01

1.0 GENERAL

.1 Section 01 55 00 addresses general requirements for temporary vehicle movement, site access and parking not incorporated into the final or permanent work, as well as traffic control during construction. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 Comply with General Conditions, Clause 4.4, Temporary Structures and Facilities.

.3 During progress of the Works, make adequate provision to accommodate normal traffic along streets and highways immediately adjacent to or crossing the Works so as to minimize inconvenience to the general public.

.4 Give minimum 48 h notice or as otherwise required by local bylaws to local police, fire departments, emergency services and municipal works authorities prior to beginning construction and comply in all respects with their requirements.

.5 Inform all owners or occupants of properties where access is affected in advance of proposed road and/or sidewalk closures.

1.1 Section 01 55 00 Includes

.1 Temporary Access Roads

.2 Temporary Parking Areas

.3 Traffic Control

1.2 Temporary Access Roads

.1 Provide and maintain temporary access roads at locations approved by the Contract Administrator.

1.3 Temporary Parking Areas

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

1.4 Traffic Control

.1 During progress of the Work, make adequate provision to accommodate normal traffic along streets and highways immediately adjacent to or crossing the Works so as to cause minimum of inconvenience to general public.

.2 Regulate traffic in general accordance with municipal requirements except where specified otherwise and in compliance with specific requirements stipulated herein.

.3 Comply with requirements of the "Traffic Control Manual for Work on Roadways", published by the British Columbia Ministry of Transportation, for regulation of vehicle and pedestrian traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.

.4 When working on travelled way:

.1 Place equipment in such position as to present a minimum of interference and hazard to the travelling public.

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

.3 Do not leave equipment on travelled way overnight.

.5 Do not close any lanes of road or highway without prior approval of the Contract Administrator. Before re-routing traffic erect suitable signs and devices as approved by the Contract Administrator. Provide sufficient crushed gravel to ensure a smooth riding surface during work.

.6 Keep travelled way well graded, free of pot holes and of sufficient width that required number of lanes of traffic may pass.

.7 When directed by Contract Administrator, provide well graded, gravelled detours or temporary roads to facilitate passage of traffic around restricted construction area. Provide and maintain signs and lights and maintain roadway.

.8 Provide and maintain reasonable road access and egress to property fronting along or in vicinity of work under contract unless approved otherwise by Contract Administrator.

.9 Traffic Control Informational and Warning Devices

.1 Meet with Contract Administrator prior to commencement of work to prepare list of signs and other devices required for project.

.2 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which may require road user response.

.3 Supply and erect signs, delineators, barricades and other miscellaneous warning devices in accordance with Municipal requirements.

.4 Place signs and other devices in additional locations as appropriate or as directed by the Contract Administrator.

.5 Continually maintain traffic control devices in use by:

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

.2 Removing or covering signs which do not apply to conditions existing from day to day.

.10 Control of Traffic Using Flaggers

.1 Provide flag persons, trained and properly equipped for the following situations:

.1 When public traffic is required to pass working vehicles or equipment which may block all or part of travelled roadway.

.2 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.

.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncom

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

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

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

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

.11 Provide pilot cars where public traffic must use particularly hazardous routes or where traffic is required to remain in one lane or change periodically from one lane to another or negotiate sections of construction at restricted speed. Equip pilot cars with orange flashing lights and signs clearly designating vehicles as pilot cars.

.12 Provide and maintain suitable detours or temporary access routes for pedestrian traffic, complete with suitable warning and advisory signs.

.13 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by Contract Administrator to protect and control public traffic, existing conditions for traffic may be restricted.

1.5 Payment

.1 Payment for all work performed under these Sections will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.

1.6 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

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END OF SECTION 01 55 00

1.0 GENERAL

.1 Section 01 57 01 addresses general requirements for temporary controls and environmental protection. This section is not intended to identify all and/or specific requirements. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 Comply with General Conditions, Clause 20.4, Environmental Laws.

1.1 Section 01 57 01 Includes

.1 Temporary Erosion and Sediment Control

.2 Temporary Pest Control

.3 Environmental Protection

.4 Temporary Storm Water Pollution Control

1.2 Temporary Erosion and Sediment Controls

.1 Drainage

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not discharge water containing suspended materials into watercourses, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Federal, Provincial and Municipal requirements.

.2 Work Adjacent to Watercourses

.1 Work around watercourses shall be done in accordance with the most recent version of the "Land Development Guidelines" published by the Provincial Ministry of Environment.

.2 Do not operate construction equipment in

.3 Do not use watercourse beds for borrow material without approval from Federal, Provincial and Municipal authorities.

.4 Do not dump excavated fill, waste material or debris in or adjacent to watercourses.

.5 Design and construct temporary crossings to minimize erosion to watercourses.

.6 Do not skid logs or construction materials across watercourses.

.7 Avoid spawning beds when constructing temporary crossings of watercourses.

.8 Do not blast under water or within 100 m of spawning beds without approval from Federal, Provincial and Municipal authorities.

.3 Products for Temporary Erosion and Sediment Controls:

.1 Silt Barrier Fence:

.1 Silt fence to be manufactured from a woven, slit film geotextile material with a shiny to smooth surface texture designed to reduce velocity of runoff to point that suspended particles settle out due to reduction of hydraulic energy.

.2 Silt Barrier Fence Minimum Requirements:

PROPERTY	VALUE
Grab Tensile	500 N
Mullen Burst	1900 kPa
Elongation at Break	25% Maximum
Opening	600 µm maximum
U.V. Rating @ 500 hrs	90% Retained
Efficiency	> 75% minimum
Construction	Woven (tape)
Texture	Smooth, Shiny
Posts	4 x 4 cm, treated
Post Spacing (centres)	2 metre maximum
Permittivity	10 L/s/m^2
Above values are "Minimum Average Roll Values"	

.4 Execution for Temporary Erosion and Sediment Controls:

.1 Silt Barrier Fence Placement:

.1 Place silt barrier in a manner that will intercept runoff at or close to right angles to flow. In areas where problem is severe, erect two or more silt barriers parallel to each other, until required degree of control is achieved.

.2 Fence height as specified on Contract Drawings.

.3 Position posts in such a manner that Fence structure remains naturally taut and placed or driven a minimum of 500 mm into ground. Posts to always be positioned downstream.

.4 Where a 500 mm depth is impractical or Impossible to adequately secure or to brace posts to prevent overturning of fence due to sediment loading.

.5 Bury excess geotextile at bottom of silt fence minimum of 150 mm in trench located upstream such that no flow can pass under fence.

.6 Splice subsequent lengths of barrier only at support post locations. Splice by wrapping geotextile fabric completely around each of two abutting support posts, as detailed on Contract Drawings, such that the gap between abutting posts is completely covered by both sections of fabric.

.2 Silt Barrier Fence Quantities:

.1 Limit silt fence to handle area equivalent to maximum 100 m^2 per 3 m of fence.

.2 Do not use where site slope is steeper than 3:1, and water flow rates exceed 0.03 m^2/s per 3 m of fence.

.3 Silt barrier to have efficiency > 75%. Employ successive, parallel fences to achieve required degree of control.

.3 Silt Fence Maintenance:

.1 Maintain integrity of silt fences as long as necessary to contain sediment runoff. Inspect all temporary silt fences immediately after each rainfall and at least daily during prolonged rainfall. Immediately correct any deficiencies.

.2 In addition, make daily review of location of silt fences in areas where construction activities have changed natural contours and drainage runoff to ensure that silt fences are properly located for effectiveness. Where deficiencies exist, install additional silt fences. Should silt fence become damaged or otherwise ineffective while barrier is still necessary, repair or replace promptly.

.3 Remove sediment deposits when deposit reaches approximately one-third of height of silt fence or install second silt fence upslope.

.4 Do not remove silt fence until Contract Administrator directs that it be removed.

1.3 Temporary Pest Controls NOT USED

1.4 Environmental Protection

.1 Fires:

.1 Fires and burning of rubbish on site not permitted without approval of the Contract Administrator. All fires to conform to Provincial and Municipal regulations.

.2 Site Clearing and Plant Protection:

.1 Protect trees and plants on site and adjacent properties where shown on Contract Drawings.

.2 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.3 Minimize stripping of topsoil and vegetation.

.4 Restrict tree removal to areas indicated or designated by Contract Administrator.

.3 Pollution Control:

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

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

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

1.5 Temporary Storm Water Pollution Controls NOT USED

1.6	**Payment**	.1	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Schedule of Quantities and Prices.
1.7	**Inspection and Testing**	.1	Refer to General Conditions, Clause 4.12, Inspections.
1.8	**Clean Up**	.1	At completion of construction phase or as directed by Contract Administrator, remove and dispose of any silt accumulations, dress area to give a pleasing appearance, and vegetate all bare areas as specified in Supplementary Specifications or as shown on Contract Drawings.
2.0	**PRODUCTS**	NOT USED	
3.0	**EXECUTION**	NOT USED	

END OF SECTION 01 57 01

1.0 GENERAL

.1 Section 31 11 01 refers to those portions of the work that are unique to clearing and grubbing. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

.1	Environmental Protection	Section 01 57 01
.2	Shrub and Tree Preservation	Section 31 11 41
.3	Site Grading	Section 31 22 01
.4	Excavating, Trenching and Backfilling	Section 31 23 01
.5	Roadway Excavation, Embankment and Compaction	Section 31 24 13

1.2 Definitions

.1 Clearing consists of cutting off trees, brush and heavy vegetative growth to not more than a specified height above ground and disposing of felled trees, brush, vegetative growth, including all underbrush, deadwood and surface debris.

.2 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing flush with existing grade and disposing of fallen timber and surface debris.

.3 Clearing isolated trees consists of cutting off to not more than a specified height above ground designated trees and disposing of felled trees and debris.

.4 Grubbing consists of excavation and disposal of stumps and roots to not less than a specified depth below existing ground surface.

1.3 Protection of Existing Features

.1 Prevent damage to all adjacent natural growth, landscaping, buildings, structures and underground and overhead utilities. Make good all damage to satisfaction of Contract Administrator.

.2 Apply specified tree paint to cuts or scars suffered by vegetation designated to remain.

1.4 Measurement and Payment

.1 Payment for all clearing and grubbing items includes removal and disposal of all branches, stumps, timbers and vegetation remains.

.2 Payment for all clearing and grubbing items will be based on the areas or isolated trees to be cleared and grubbed as shown on Contract Drawings or as directed by Contract Administrator.

1.5 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

.1 Prior to clearing, verify limits of clearing with Contract Administrator, and determine any restrictions regarding preservation of existing trees, shrubs, natural features or improvements within or adjacent to specified limits of clearing.

3.1 Clearing

.1 Clear trees, shrubs, uprooted stumps and surface debris not designated to remain.

.2 Cut off trees, brush, and scrub at a height of not more than 300 mm above ground. In areas to be subsequently grubbed, ensure height of stumps left from clearing operations not more than 1000 mm above existing ground.

.3 Upon written authorization from Contract Administrator, cut off unsound branches of trees designated to be preserved and fall isolated trees overhanging area to be cleared.

.4 Preserve all shrubs, trees or other cultivated plants specified for replanting.

3.2 Close-Cut Clearing

.1 Cut off trees, shrubs, stumps and other vegetation at ground level.

3.3 Isolated Trees

.1 Cut off isolated trees as shown on Contract Drawings or as directed by Contract Administrator at height of not more than 300 mm above existing ground.

.2 Grub out isolated tree stumps.

3.4 Grubbing

.1 Grub out stumps and roots to not less than 200 mm below existing ground surface.

3.5 Removal and Disposal

.1 Unless specified otherwise in Supplementary Specifications all timber becomes property of Contractor.

.2 Dispose of cleared and grubbed material as work progresses and do not accumulate.

.3 Fires and burning of rubbish on site not permitted without approval of the Contract Administrator. All fires to conform to Provincial and Municipal regulations.

.4 Dispose cleared and grubbed materials to approved off-site disposal area. Complete and submit required documents under Provincial Contaminated Sites Legislation before removing material.

.5 Where specified, chip or mulch and spread cleared and grubbed vegetative material on site.

3.6 Finished Surface

.1 Leave ground surface in condition suitable for immediate grading operations or stripping of topsoil if so specified.

END OF SECTION 31 11 01

1.0 GENERAL

.1 Section 31 11 41 refers to those portions of the work that are unique to the preservation of existing shrubs and trees. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 This section is based on the "British Columbia Landscape Standard" published by the B. C. Society of Landscape Architects and the B. C. Nursery Trades Association. This standard is intended to set a level of quality which is to be equalled or bettered in the construction documents for each project. Guidance of a registered British Columbia Landscape Architect is recommended.

.3 The International Society of Arboriculture publication, Guidelines for Establishing Values of Trees and other Products shall apply where plant material values are required to be established.

1.1 Related Work

.1	Clearing and Grubbing	Section 31 11 01
.2	Site Grading	Section 31 22 01
.3	Excavating, Trenching and Backfilling	Section 31 23 01
.4	Roadway Excavation, Embankment and Compaction	Section 31 24 13
.5	Topsoil and Finish Grading	Section 32 91 21
.6	Planting Trees, Shrubs And Ground Covers	Section 32 93 01

1.2 References

.1 British Columbia Landscape Standard.

.2 Canadian System of Soil Classification.

.3 International Society of Arboriculture. Guide for Establishing Values of Trees and Other Plants, 1983.

1.3 Measurement and Payment

.1 Payment for all shrub and tree preservation and grade changes items includes all applicable work described in this Section and will cover area of shrubs or individual trees to be attended to as shown on Contract Drawings or as directed by Contract Administrator.

1.4 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

2.1 Materials

.1	Native material:	to Section 31 05 17 - Aggregates and Granular Materials.
.2	Pit run gravel:	to Section 31 05 17 - Aggregates and Granular Materials.
.3	Pit run sand:	to Section 31 05 17 - Aggregates and Granular Materials.
.4	Drain Rock:	to Section 31 05 17 - Aggregates and Granular Materials.
.5	Imported Topsoil:	to Section 32 91 21 - Topsoil and Finish Grading.

.6 Drainpipe: 100 mm diameter corrugated plastic perforated tubing complete with snap couplings to CGSB 41-GP-31M or perforated PVC sewer pipe to CSA B182.1.

.7 Asphalted felt: to CSA A123.

.8 Fertilizer: complete commercial fertilizer (10-6-4 or approved type) with 50% of elements derived from organic sources.

.9 Wound dressing: horticulturally accepted non- toxic, non-hardening emulsion.

3.0 EXECUTION

3.1 Existing Trees

.1 Inspect with Contract Administrator and clearly identify on site all existing shrubs and trees shown on Contract Drawings or designated by Contract Administrator to be preserved. Establish barricades or suitable markings around such shrubs and trees.

.2 Do not undertake construction procedures, stockpiling of materials or disposal adjacent to designated trees or areas to be preserved.

.3 Do not undertake construction procedures which substantially alter natural drainage patterns. Provide interim drainage or irrigation as necessary to compensate for construction interference.

.4 Where specified or shown on Contract Drawings apply fertilizer at rate of 50 g/mm of calliper to existing trees to be retained. Take calliper measurement 0.3 m above grade. Apply once early in growing season unless specified otherwise.

.5 Distribute fertilizer equally into holes drilled 200-250 mm deep, spaced 600-750 mm apart and located in circular pattern between 2/3 and limit of each tree's branch spread. Water thoroughly after fertilizer applied.

.6 Water retained trees 3 times during summer. Soak area immediately below tree crown sufficiently deep to reach feeder roots.

3.2 Raising Grade Around

.1 Apply fertilizer as specified in 3.1.4 and 3.1.5, of this Section, before revising grade.

.2 Install drainpipe on existing grade consisting of 8 spokes radiating out from trunk to limit of branch spread. Slope slightly away from trunk and connect ends to form shape of wheel. Place uprights at both ends of each spoke to reach new grade level to provide aeration and means of watering.

.3 Obtain Contract Administrator's approval before backfilling drainpipe.

.4 Protect bark of buried portion of tree from abrasion by surrounding trunk with asphalted felt. Leave minimum 50 mm space between protective material and bark. Fill space with 9.5 mm drain rock.

.5 Use drain rock fill to cover 150 mm over and around each side of drainpipe. Use pit run sand fill for remainder of drainage course between radial spokes to minimum depth of 150 mm. Use approved native material or pit run gravel fill to raise grade to required level, making allowance for imported topsoil specified in Section 32 91 21 – Topsoil and Finish Grading. Fill vertical drains with 9.5 mm drain rock.

.6 Compact fill without disturbing or damaging buried drainpipe. Use frost-free materials over frost-free ground conditions. Compact fill to 80% Modified Proctor density in compliance with ASTM D1557.

3.3 Lowering Grade Around Existing Trees

.1 Cut specified slope from edge of branch spread to new grade level. Grade topsoil berm for each tree at periphery of branch spread to hold water where required.

.2 If excavation through roots is required, excavate by hand and cut roots with sharp axe, tree lopper or saw. Seal cut edges 10 mm in diameter and larger with wound dressing.

.3 Apply fertilizer after excavation backfilled and grading completed. Do not permit root system to dry out at any time.

3.4 Pruning

.1 Selectively remove 1/3 of tree branches to reduce transpiration and compensate for dieback of roots in fill conditions and damage to root system in cut conditions.

3.5 Clean Up

.1 After construction and prior to final inspection remove all fencing and flagging. Remove any dead branches or dying limbs on trees at the direction of the Contract Administrator.

.2 Replace any trees the Contract Administrator assesses as irreparably damaged as determined by an Arborist and according to the requirements of the International Society of Arboriculture Guide for Establishing Value of Trees or Other Plants, 1983.

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END OF SECTION 31 11 41

1.0 GENERAL

.1 Section 31 22 01 is a "Landscaping" Section and refers to those portions of the work that are unique to preparation of subgrade, by rough grading and filling, to provide a base that will allow placing of growing medium (topsoil) to specified depths. **THIS SECTION DOES NOT APPLY TO GRADING PRIOR TO PLACEMENT OF PAVED OR CONCRETED SURFACES.** This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 This section is based on the "British Columbia Landscape Standard" published by the B. C. Society of Landscape Architects and the B. C. Nursery Trades Association. This standard is intended to set a level of quality which is to be equalled or bettered in the construction documents for each project. Guidance of a registered British Columbia Landscape Architect is recommended.

1.1 Related Work

.1	Topsoil and Finish Grading	Section 32 91 21
.2	Seeding	Section 32 92 20
.3	Hydraulic Seeding	Section 32 92 19
.4	Sodding	Section 32 92 23
.5	Planting of Trees, Shrubs and Ground Covers	Section 32 93 01

1.2 References

.1 British Columbia Landscape Standard.

.2 Canadian System of Soil Classification.

1.3 Site Conditions

.1 Examine site with Contract Administrator and obtain approval of previous work prior to commencing site grading.

.2 Comply with General Conditions, Clause 4.3, Protection of Work, Property, and the Public and General Conditions, Clause 4.5, Errors, Inconsistencies or Omissions in the Contract Documents.

1.4 Measurement and Payment

.1 Measurement for topsoil stripping including stockpiling for re-use will be made from before and after cross sections of stripped area as determined by Contract Administrator.

.2 Payment for rough site grading includes cut and fill excavation and its on-site redistribution and compaction to design elevations and grades with off-site disposal of surplus materials to be paid for separately.

Measurement for rough site grading will be made for the entire area graded including excavating and filling.

.3 Measurement for Contract Administrator approved or Contract Drawing specified fill materials including compaction will be based on weigh tickets provided to Contract Administrator as loads are delivered.

.4 Measurement for removal and disposal of soft or unsuitable subgrade material including overlying top soil will be made by loose truck box volume as determined by Contract Administrator. Specified backfill and compaction will be paid under 1.4.3 of this Section.

.5 Preparation including compaction where applicable of subgrade prior to placing of topsoil or fill material will only be carried out upon specific instruction of Contract Administrator.

.6 Measurement for loading, hauling from stockpile and re-use of excavated material at locations away from the stockpile as specified or as directed by Contract Administrator will be based on measurements made before and after excavation from stockpiled location.

.7 Measurement for off-site disposal of surplus material from rough site grading will be made by loose truck box volume.

.8 Payment for topsoil stripping including disposal will be treated as common excavation under Section 31 24 13 - Roadway Excavation, Embankment and Compaction - 1.8.5.

1.5 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

2.1 Materials

.1 Fill material: in case of deficit of in-place or specified materials, all additional materials necessary to bring site up to specified grade to comply with material specified in appropriate Section or shown on Contract Drawings.

.2 Obtain approval from Contract Administrator for excavated or graded material to be used as fill for grading work. Protect approved material from contamination.

.3 Fill material to be placed under areas to be landscaped, i.e., with grass, sod, groundcover, shrubs and trees, to be non-toxic to plant and animal life in part or in concentration (leachate).

3.0 EXECUTION

3.1 Stripping of Topsoil

.1 Strip all organic material to specified limits and specified depth. Stockpile for re-use as shown in Contract Documents. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected. Remove all debris and unusable material as specified in the Contract Documents.

.2 Surface drainage: provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area and adjacent and other affected properties. Provide siltation controls to protect natural watercourses or existing drainage facilities.

3.2 Grading

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as shown on Contract Drawings.

.2 Compact subgrade to a consistent 80% Modified Proctor Density in compliance with ASTM D1557.

.3 Excavate soft and unstable areas below subgrade that cannot be compacted to this standard and fill with approved fill material, except in locations where special environmental conditions have been identified. In such cases, comply with Supplementary Specifications and details shown on Contract Drawings.

.4 Remove and dispose to approved off-site disposal area, all debris, roots, branches, stones, building material, contaminated subsoil, visible weeds and anything else that may interfere with proper growth and development of planned finished landscaping.

.5 Place fill materials to elevations and sections shown on Contract Drawings. Place in maximum 200 mm lifts and compact each lift to 80% Modified Proctor Density.

.6 Scarify areas showing excessive compaction to minimum depth of 150 mm and compact to 80% Modified Proctor Density immediately before placing growing medium (topsoil).

.7 Ensure gradients within ranges shown in Table 1, except where Contract Drawings show variation from this standard.

.8 Grade transitions of subgrade smooth and even, such that ponding cannot occur on subgrade surface.

TABLE 1: Maximum and Minimum Gradients in

Location	Minimum	Maximum
Lawn and Grass	50:1 (2%)	3:1
Grass Swales (without additional erosion protection)	50:1 (2%)	10:1 (10%)
i) Slope along inverts	6:1 (Preferred)	3:1
ii) Side Slopes		
Unmowed Areas	100:1 (1%)	2:1*
Planted Areas	50:1 (2%)	2:1*

* Unless directed otherwise by Contract Administrator

3.3 Tolerances

.1 Accuracy of subgrade elevations to be within tolerances shown in Table 2.

TABLE 1: Maximum and Minimum Gradients in

Location	Minimum	Maximum
Lawn and Grass	50:1 (2%)	3:1
Grass Swales (without additional erosion protection)	50:1 (2%)	10:1 (10%)
iii) Slope along inverts	6:1 (Preferred)	3:1
iv) Side Slopes		
Unmowed Areas	100:1 (1%)	2:1*
Planted Areas	50:1 (2%)	2:1*

* Unless directed otherwise by Contract Administrator

3.4 Surplus Material

.1 Remove surplus material unsuitable for fill, grading or landscaping from site and dispose at approved disposal area.

3.5 Topsoil and Finish Grading

.1 See Section 32 91 21 - Topsoil and Finish Grading for placement and finish grading of growing medium (topsoil).

END OF SECTION 31 22 01

1.0 GENERAL

.1 Section 31 23 01 refers to those portions of the work that are unique to excavating, trenching and backfilling of underground utility installations and related structures. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein. This section shall also refer to installation of pipe and conduit installed for telephone and cable television, gas and electrical services.

1.1 Related Work

.1	Environmental Protection	Section 01 57 01
.2	Rock Removal	Section 31 23 17
.3	Controlled Density Fill	Section 31 23 23
.4	Aggregates and Granular Materials	Section 31 05 17
.5	Waterworks	Section 33 11 01
.6	Storm Sewers	Section 33 40 01
.7	Pipe Culverts	Section 33 42 13
.8	Manholes and Catchbasins	Section 33 44 01
.9	Sanitary Sewers	Section 33 30 01
.10	Sewage Forcemains	Section 33 34 01
.11	Topsoil and Finish Grading	Section 32 91 21

1.2 References

.1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 01 42 00 – Reference Specifications – Site and Infrastructure.

1.3 Definitions

.1 Rock Excavation: As defined in Section 31 23 17 - Rock Removal.

.2 Common Excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, partially cemented materials, clay or frozen materials which can be ripped and excavated with heavy construction equipment.

.3 Over-excavation: excavation below design elevation of bottom of specified bedding, and including backfilling of resultant excavation with specified material, as authorized by Contract Administrator.

.4 Removals: removal and disposal at an approved location off-site of surface concrete structures and walks, curbs, gutters, manholes, catchbasins, pipes, culverts, endwalls, and any other structures on surface or underground specifically designated on Contract Drawings for removal. Removals to include backfilling of resultant excavation with specified material.

.5 Native Topsoil: to Section 32 91 21 - Topsoil and Finish Grading.

1.4 Protection of Work Property and Public

.1 Comply with General Conditions, Clause 4.3, Protection of Work, Property, and the Public.

1.5 Safety Requirements

.1 Comply with General Conditions, Clause 4.2, Safety.

.2 Design and install trench shoring in accordance with the regulations of the WorkSafe BC.

1.6 Blasting

.1 Ensure all blasting operations comply with Section 31 23 17 - Rock Removal.

1.7 Disposal

.1 Dispose of all surplus spoil from excavations on-site and/or off-site as shown on Contract Drawings or as specified in Contract Documents. Suitability of excavated material for use as native bedding or trench backfill will be governed by 2.0 of this Section. Dumping of spoil on private property will be permitted only upon written approval from property owner and provided all necessary permits and approvals have been obtained.

1.8 Limitations of Open Trench

.1 Excavate trenches only as far in advance of pipe laying operation as safety, traffic, and weather conditions permit and, in no case, to exceed 30 m. Before stopping work on last day of work before each weekend or holiday, completely backfill every trench. If circumstances do not permit complete backfilling of all trenches, adequately protect all open trenches or excavations with approved fencing or barricades and, where required, with flashing lights.

1.9 Permits and Approvals

.1 Comply with General Conditions, Clause 20, Laws, Notices, Permits and Fees.

1.10 Measurement and Payment

.1 With the exception of pay items specifically identified hereunder, payment for all other work performed under this Section will be included under payment for work involved in trenchwork as described in other Sections.

.2 Additional payment for trench excavation by hand will only be made in addition to the work items involving trenchwork where excavation by machinery is not practicable and only under prior approval by Contract Administrator.
Payment will be based on before and after excavation cross-section areas at sufficient equal intervals over the length of trench so excavated.

.3 Payment for over-excavation including backfilling will only be made for over-excavation authorized by Contract Administrator.
Payment will be based on before and after excavation cross-section areas at sufficient equal intervals over the length of over-excavation.

.4 Payment for removal and disposal of disused pipes and headwalls encountered during trench excavation to specific disposal site will be in addition to trenchwork with no deduction of payment from such trenchwork. No payment will be made under this item for removal and disposal carried out as part of the operation for removal and disposal of excavated materials from trenchwork.

.5 All costs incurred as a result of unauthorized excavation beyond neat lines or limits of excavation shown on Contract Drawings or Standard Detail Drawings including remedial backfilling will be to Contractor's cost.

.6 Measurement for excavation of new channels and ditches will be based on before and after excavation cross-section areas at sufficient equal intervals over the entire length of the channels or ditches.

.7 Payment for cleaning and deepening of existing channel or ditch will be made separately for each location or over sections with generally similar cross sections before and after cleaning.

.8 Payment for swales in boulevard or other locations as shown on Contract Drawings includes excavation, grading, addition and removal of native materials as required to form swales to suit local conditions and to provide proper drainage.

1.11 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

2.1 General

.1 Unless shown otherwise on Contract Drawings the materials specified in 2.2 of this Section are approved for their respective uses.

2.2 Use of Specified Materials

.1 Backfill for over-excavated trench or structure excavations to be one of the following:

- .1 Granular pipe bedding and surround material.
- .2 Pit run sand.
- .3 Drain rock (only where approved by Contract Administrator).
- .4 Concrete.
- .5 Controlled density fill.

.2 Pipe bedding and surround: see applicable Sections:

.1	Waterworks	Section 33 11 01
.2	Storm Sewers	Section 33 40 01
.3	Pipe Culverts	Section 33 42 13
.4	Sanitary Sewers	Section 33 30 01
.5	Sewage Forcemains	Section 33 34 01
.6	Roadway Lighting	Section 26 56 01

.3 Trench and excavation backfill to be one of the following:

- .1 Approved native material.
- .2 Pit run gravel.
- .3 Pit run sand.
- .4 Controlled density fill.

.4 Surface treatment to be:

- .1 Restoration to match existing conditions.
- .2 Subgrade, subbase and base for works described in other Sections.
- .3 Topsoil, grass, sod or requirements for landscaping works described in other Sections.

2.3 Materials

.1 Refer to Section 31 05 17- Aggregates and Granular Materials for specifications for approved granular materials and approved native material.

.2 Other granular materials: granular materials approved for roadwork (subbase, base,) also acceptable for trench backfill subject to approval of Contract Administrator.

.3 Concrete: to Section 03 30 53 – Cast-In-Place Concrete, to be minimum 20 MPa.

.4 Controlled Density Fill: to Section 31 23 23 – Controlled Density Fill, to be maximum 0.5 MPa.

3.0 EXECUTION

3.1 Site Preparation

.1 Remove all brush, weeds, grasses and accumulated debris to an approved offsite location.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation as shown on Standard Detail Drawing G4 in order that surface may break evenly and cleanly. Cut beyond limits shown only if authorized by Contract Administrator.

.3 Where trench passes through lawn, neatly cut and remove sod before trench excavation. Save sod for replacement upon backfilling trench.

.4 Strip topsoil after area has been cleared and stockpile in locations as shown on Contract Drawings. Stockpile height not to exceed 2 m. Avoid mixing topsoil with subsoil. Dispose of unused topsoil as specified. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

3.2 Stockpiling

.1 Stockpile fill materials in areas designated by Contract Administrator. Stockpile granular materials in manner to prevent segregation.

3.3 Excavation

.1 Connection to existing mains:

.1 Prior to or at commencement of construction, check existing main for line and elevation at point of connection. If found different from Contract Drawings report such difference to Contract Administrator immediately. Comply with General Conditions, Clause 4.5, Errors, Inconsistencies or Omissions in the Contract Documents.

.2 Connections to existing waterworks systems to be made by Municipal crews unless shown otherwise on Contract Drawings. Make all necessary arrangements with Contract Administrator to schedule work to prevent construction delays.

.3 Connections to existing sanitary and storm sewer systems to be made by Contractor unless shown otherwise on Contract Drawings. Notify Contract Administrator minimum 48h in advance of scheduled connection. Make connection in presence of Contract Administrator.

.4 To prevent damage to existing utilities, excavate last 300 mm over utility by hand.

.2 Surface drainage:

.1 Provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area and adjacent and other affected properties. Provide siltation controls to protect natural watercourses or existing municipal drainage facilities.

.2 Comply with Section 01 57 01 - Environmental Protection.

.3 Excavation to grade: excavate trenches to allow pipe to be laid to alignment and grades required with allowance for specified pipe bedding.

.4 Excavation below grade: when bottom of excavated trench at subgrade is unstable and in opinion of Contract Administrator, cannot adequately support pipe, install pipe using concrete bedding as shown on Contract Drawings or over-excavate trench to suitable subgrade or as directed by Contract Administrator. Backfill over-excavation with specified materials and compact to minimum 95% Modified Proctor density in compliance with ASTM D1557. Use drain rock backfill only if authorized by Contract Administrator.

.5 Trench width: excavate trench to section and dimensions shown on Standard Detail Drawing G4. If width exceeds maximum allowable, Contractor may be required to demonstrate that specified pipe is still adequate or provide pipe with approved higher strength class or provide approved higher class of bedding. All additional requirements as a result of excessive trench width to be to Contractor's cost.

.6 Hand excavation: excavate by hand if necessary to preserve or minimize damage to existing trees, shrubs, buildings and all similar existing features or facilities.

.7 Trench bottom conditions: remove disturbed or softened material from trench bottom before placing bedding material. Maintain trench free from water and soft materials during placement of pipe bedding, pipe installation and trench backfill to ensure proper compaction of granular materials.

.8 Trench drainage:

.1 During pipe laying, jointing, bedding and backfilling, keep trench free of water by pumping or other appropriate means. Provide pumps and dewatering equipment and take precautions to prevent any damage to adjoining buildings, structures, roads or land from prolonged or excessive pumping by installing shoring, sheeting or other supportive measures. Discharge water from excavations in such a manner as not to cause nuisance, injury, loss or damage. Contractor to be responsible for any claims or actions arising from such discharge of water.

.2 Keep bell holes free from water during jointing. Diverting trench water through newly laid system not allowed, unless authorized by Contract Administrator.

.9 Disposal of surplus soil: dispose of surplus excavated soil off-site. Side-casting not allowed in restricted areas where, in opinion of Contract Administrator, side-casting would create interference with flow of traffic. In such case, temporarily store materials or dispose to an approved site. Provisions of Provincial Contaminated Sites Legislation must be met prior to disposal of soil offsite.

.10 Native Backfill: Where native backfill is approved for re-use, and side-casting not allowed, transport approved material to other locations where material is required or temporarily store at approved site. Protect stored material from contamination, segregation and weather.

.11 Rock Excavation: Rock excavation to Section 31 23 17 - Rock Removal.

.12 Maintain roads used for transporting materials and equipment in clean condition. Clean, flush and/or sweep on daily basis and more frequently if directed by Contract Administrator.

3.4 Pipe Installation

.1 Related work: Pipe installation, including bedding, pipe laying, and granular surround to be in accordance with following sections:

.1	Waterworks	Section 33 11 01
.2	Storm Sewers	Section 33 40 01
.3	Pipe Culverts	Section 33 42 13
.4	Manholes and Catchbasins	Section 33 44 01
.5	Sanitary Sewers	Section 33 30 01
.6	Sewage Forcemains	Section 33 34 01

.2 Concrete encasement or protection: where specified or required by Contract Administrator provide concrete encasement of pipe or slab protection as shown on Standard Detail Drawings G6 and G7. Do not place backfill material until concrete has taken its initial set and in no case less than 1 h.

.3 Anchor blocks: where specified or required by Contract Administrator provide anchor blocks as shown on Standard Detail Drawing G8. Ensure all concrete anchor blocks at least 150 mm into undisturbed ground on bottom and sides of trench. Concrete strength as specified on Standard Detail Drawing G8.

3.5 Backfill and Compaction

.1 General: Place backfill carefully in trench to prevent damage to installed pipe.

.2 Shoring: during backfill and compaction of trench, remove shoring in such a manner as to allow proper compaction and to prevent trench walls from collapsing. Remove all bracing and/or shoring from trench.

.3 Backfill Materials:

.1 Boulevards and easements: for trenches in boulevards, easements or other areas not subjected to vehicle loading, and outside of ditchlines, backfill with approved native material except as shown otherwise on Contract Drawings.

.2 Roads, driveways and shoulders: for trenches in paved or gravelled roads, driveways, shoulders or other areas subjected to vehicle loading, backfill with imported granular material or approved native material as specified on Contract Drawings.
Road shoulder is that portion of right-of-way between travelled portion of road, either paved or gravelled, and road ditch. Where no ditch exists, ensure shoulder width minimum of 1.5 m.

.3 Ditches: backfill with imported granular material or approved native material as specified on Contract Drawings.

.4 Contract Administrator may permit native material for all above uses subject to suitability of native material for said use. Native material approved for re-use to be handled, stockpiled and compacted using construction method appropriate for given moisture content and weather conditions.

.5 Controlled Density Fill: Place controlled density fill in accordance with Section 31 23 23 - Controlled Density Fill.

.4 Compaction: place backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).

.1 Boulevards and easements to minimum 90%.

.2 Roads, driveways, shoulders, re-shaped ditches and sidewalks to minimum 95%.

.3 Use caution in pipe zone to ensure no damage to pipe.

3.6 Surface Restoration

.1 General:

.1 Restore all disturbed surfaces to condition at least equal to that which existed prior to construction.

.2 Make good any damage to adjacent lands or improvements.

.3 Resolve all reasonable claims arising from Contractor's actions and obtain written releases from land owners following final restoration.

.2 Boulevards and easements:

.1 Restore surface to minimum 100 mm depth.

.2 Restore unimproved surfaces with material equal to that removed at surface.

.3 Restore gardens with approved topsoil or bark mulch to match existing conditions.

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

.5 Restore gravel surfaces with matching granular materials.

.6 Complete final restoration immediately upon completion of trench backfilling.

.3 Gravelled roads and driveways:

.1 Restore surface with minimum 75 mm to 100 mm thick lift of 19 mm granular road base material.

.2 Compact to minimum 95% Modified Proctor density.

.3 Complete final restoration immediately upon completion of trench backfilling.

.4 Ditches:

.1 Re-shape ditches to specified lines, grades and sections and restore surface with minimum 300 mm of specified material to ensure stability of ditch slopes and bottom.

.2 Compact to minimum 95% Modified Proctor density.

.3 Complete final restoration immediately upon completion of trench backfilling.

.5 Base preparation for paved surfaces:

.1 Paved surfaces to include all paved roads, driveways, sidewalks and parking areas.

.2 If native material used for backfill provide specified depth of subbase as shown on Contract Drawings.

.6 Temporary pavement patching:

.1 Patch arterial and collector roads same day excavation made.

.2 Patch all other roads within 24 h of closing trench.

.3 Patching material to be hot-mix asphalt on all roads unless specified otherwise, cold-mix may be used only where directed by Contract Administrator.

.4 Place temporary pavement to 50 mm minimum thickness.

.5 Maintain temporary patch to ensure safe and smooth conditions.

.7 Permanent pavement restoration:

.1 Install permanent pavement within 30 days of placement of temporary patch or sooner where directed by Contract Administrator.

.2 Remove broken or cracked pavement as well as any paved areas showing settlement and dispose off-site.

.3 Remove underlying granular road base material as required to permit placement of specified thickness of permanent pavement. Ensure remaining base meets specified thickness. Material and placement of road base to Section 32 11 23 – Granular Base.

.4 Compact base to minimum 95% Modified Proctor density.

.5 Restore pavement as detailed on Standard Detail Drawing G5. If thickness of existing pavement permits, grind 35 mm depth along edge of pavement. Dry if necessary and paint clean, dry edge with asphalt emulsion (tack coat).

.6 Place and compact hot-mix pavement material to minimum thickness as shown on Standard Detail Drawing G5.

.7 Material and placement of hot-mix pavement to Section 32 12 16 - Hot-Mix Asphalt Concrete Paving.

.8 Restore surface to smooth condition and match with grade of adjacent pavement.

.9 Where shown on Contract Drawings place hot-mix overlay over restored trench section and adjacent pavement to Section 32 12 16 - Hot-Mix Asphalt Concrete Paving.

.10 Maintain restored pavements in complete repair during Maintenance Period. Effect repairs within 14 days from receipt of written notice from Contract Administrator or immediately if so directed by Contract Administrator if dangerous situation exists.

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END OF SECTION 31 23 01

1.0 GENERAL

.1 Section 31 24 13 refers to those portions of the work that are unique to roadway excavation, embankment construction and compaction. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

.1	Environmental Protection	Section 01 57 01
.2	Shrub and Tree Preservation	Section 31 11 41
.3	Clearing and Grubbing	Section 31 11 01
.4	Rock Removal	Section 31 23 17
.5	Aggregates and Granular Materials	Section 31 05 17
.6	Dust Control	Section 31 15 60
.7	Geosynthetics	Section 31 32 19
.8	Pipe Culverts	Section 33 42 13
.9	Topsoil and Finish Grading	Section 32 91 21
.10	Excavating, Trenching and Backfilling	Section 31 23 01
.11	Site Grading	Section 31 22 01

1.2 References

.1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 01 42 00 – Reference Specifications – Site and Infrastructure.

1.3 Definitions

.1 Excavation classes: only two classes of excavation will be recognized:

.1 Rock excavation: To Section 31 23 17 - Rock Removal - 1.3.

.2 Common Excavation: To Section 31 23 01- Excavating, Trenching and Backfilling - 1.3.

.2 Native Topsoil: To Section 32 91 21 - Topsoil and Finish Grading.

.3 Waste material: material unsuitable for use in work or surplus to requirements.

.4 Borrow material: material obtained from areas outside limits of work and required for construction of embankments or for other portions of work.

.5 Embankment (subgrade fill): material derived from usable excavation and placed above original ground or stripped surface up to subgrade elevation.

.6 Imported embankment fill: approved granular material, supplied by Contractor and obtained from off-site sources, to be used for embankment fill up to subgrade elevation.

.7 Pavement structure: combination of layers of unbound or stabilized granular subbase, base, and asphalt or concrete surfacing.

.8 Subgrade elevation: elevation immediately below pavement structure.

1.4 Protection of Work Property and Public

.1 Comply with General Conditions, Clause 4.3, Protection of Work Property and the Public.

1.5 Blasting

.1 All blasting operations to comply with Section 31 23 17 - Rock Removal.

1.6 Disposal

.1 Refer to Section 31 23 01 - Excavating, Trenching and Backfilling - 1.7 for re-use and off-site disposal requirements.

1.7 Permits and Approvals

.1 Comply with General Conditions, Clause 20, Laws, Notices, Permits and Fees before commencing any excavation.

1.8 Measurement and Payment

.1 Payment for clearing and grubbing will be made under pay items in Section 31 11 01 – Clearing and Grubbing - 1.4.

.2 Payment for topsoil stripping including stockpiling will be made under pay item in Section 31 22 01 - Site Grading - 1.4.1. and 1.4.6. Topsoil stripping and disposal will be treated as common excavation under this Section.

.3 Payment for rock removal will be made under pay items in Section 31 23 17 - Rock Removal - 1.6.

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

.5 Payment for common excavation includes removal of existing pavements, curbs and gutters, sidewalks, utilities strips, driveways, pipes and conduits which are removed as part of the operation for common excavation.

Measurement for common excavation:

.1 Where the average thickness of excavation is 0.5 metre or more, in-place volume will be calculated for payment from cross-sections at sufficient and equal intervals taken by Contract Administrator in areas of excavation.

.2 Initial cross-sections will be taken after clearing and grubbing and stripping of topsoil, and immediately prior to excavation.

.3 Final cross-sections will be taken upon completion of excavation to lines and levels required prior to placing of other materials over the excavated surface.

.4 Where the average thickness of excavation is less than 0.5 metre, volume will be established from loose truck box volume as determined by Contract Administrator.

.5 Payment for on-site re-use includes compaction of the re-used materials.

.6 Payment for double hauling (stockpiling and subsequent relocation from stockpile) of excavated material as specified or as directed by Contract Administrator will be based on measurements made before and after excavation from the stockpiled location.

.7 Payment for imported embankment fill will be based on weigh tickets provided to Contract Administrator as loads are delivered to site and incorporated into the work and includes compaction.

.8 Measurement for peat excavation and off-site disposal will be made by loose truck box volume in watertight truck box.

.9 Payment for subgrade preparation includes finish grading of the subgrade, removal of surplus materials, adjustment of moisture content and compaction as specified.

.10 Payment for replacement of areas of unsuitable subgrade revealed during proof rolling will include all remedial work, materials and requirements specified in this Section.
Payment will be based on quantity of suitable sub-grade delivered to site and incorporated into the work as given by weigh tickets provided to Contract Administrator.

.11 No payment will be made for:

.1 Extra handling of windrowed materials blended on embankment slopes.

.2 Removal and correction of soft or unstable material put in place by Contractor.

.12 All costs incurred as a result of unauthorized excavation beyond neat lines or limits of excavation shown on Standard Detail Drawings, or, where applicable, Contract Drawings including remedial backfilling, will be the Contractor's responsibility.

.13 Payment for gravel berm includes base preparation, berm materials and formation of berm as shown on Contract Drawing and compaction, using the low permeability granular material specified.

1.9 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

2.1 General

.1 Unless shown otherwise on Standard Detail Drawings or, where applicable, Contract Drawings materials specified in 2.2 of this Section are approved for their respective uses.

2.2 Specified Materials

.1 Backfill for embankment fill (subgrade fill) to be:

.1 Approved native or imported granular material.

.2 Pit run gravel.

.3 Pit run sand.

.4 River sand.

.2 Pit fines, cyclone sand and overburden may be utilized if approved by the Contract Administrator, but will not be acceptable if moisture content is too high to permit compaction to the specified density.

2.3 Materials

.1 Refer to Section 31 05 17 - Aggregates and Granular Materials for specifications for approved granular materials.

.2 Refer to Section 31 32 19 - Geosynthetics for specifications for geotextile material.

3.0 EXECUTION

3.1 General

.1 Clear and grub limits of excavation and/or embankment fill in accordance with Section 31 11 01 - Clearing and Grubbing.

.2 Strip all organic material to specified limits and specified depth or as directed by Contract Administrator. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected. Remove all debris. Stockpile and place topsoil as specified.

.3 Surface drainage:

.1 Provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area and adjacent and other affected properties. Provide siltation controls to protect natural watercourses or existing municipal drainage facilities.

.2 Comply with Section 01 57 01 - Environmental Protection.

3.2 Excavation

.1 Notify Contract Administrator sufficiently in advance of excavation operations for initial cross-sections to be taken.

.2 Notify Contract Administrator whenever unsuitable materials are encountered in cut sections and remove unsuitable materials to depth and extent as directed by Contract Administrator.

.3 If, during excavation, material appearing to conform to classification for rock is encountered, notify Contract Administrator in sufficient time to enable measurements to be made to determine volume of rock.

.4 Rock excavation: Rock excavation to Section 31 23 17 - Rock Removal.

3.3 Inspection of Native Surface

.1 Prior to placing embankment fill, proof roll graded native surface using fully loaded single or dual axle dump truck. Contract Administrator may authorize use of other acceptable proof rolling equipment. Remove soft or other unstable material. Replace with approved embankment fill and compact replacement fill to minimum 95% Modified Proctor density in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).

3.4 Placing

.1 Place material only on clean unfrozen surface, properly shaped and compacted and free from snow or ice.

.2 Begin spreading material on crown line or high side of one-way slope.

.3 Place materials using methods which do not lead to segregation or degradation.

.4 Place material to full width in uniform layers and compact to specified densities.

.5 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.6 Remove and replace that portion of any layer in which material becomes segregated during spreading.

.7 Where shown on Contract Drawings or as directed by Contract Administrator, scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces.

.8 Where fill material consists principally of rock:

.1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 1 m.

.2 Individual rock fragments not exceeding 1.5 m in horizontal dimension permitted provided their vertical dimension does not exceed one third of fill section depth.

.3 Carefully distribute rock material to fill voids with smaller fragments to form compact mass.

.4 Fill surface voids at subgrade level with rock spalls or selected material to form an earth-tight surface.

.5 Do not place boulders and rock fragments with dimensions exceeding 150 mm within 300 mm of subgrade elevation.

3.5 Compaction

.1 Compaction equipment to be capable of obtaining required densities in materials on project.

.2 Compact to density of not less than 95% Modified Proctor density.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted layers.

.4 Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is suitable for compaction.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers.

.6 Finish slopes to neat condition, true to line and grade.

.1 Remove boulders encountered in cut slopes and fill resulting cavities.

.2 Hand finish slopes that cannot be finished satisfactorily by machine.

3.6 Finished Tolerances

.1 Ensure finished subgrade surface within plus or minus 15 mm of specified grade and cross-section but not uniformly high or low.

.2 Ensure finished subgrade surface has no irregularities exceeding 15 mm when checked with a 3 m straight edge placed in any direction.

.3 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.7 Proof Rolling

.1 For proof rolling use fully loaded single or dual axle dump truck.

.2 Contract Administrator may authorize use of other acceptable proof rolling equipment.

.3 Proof roll top of embankment fill upon completion of fine grading and compaction.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.5 Where proof rolling reveals areas of unsuitable subgrade:

.1 Remove unsuitable embankment material to depth and extent directed by Contract Administrator.

.2 Replace with approved embankment material and compact in accordance with this section.

3.8 Place Topsoil

.1 Place, spread and grade topsoil as shown on Contract Drawings.

.2 Restore planted areas with topsoil, ground cover, and plants or shrubs to match existing planted areas as shown on Contract Drawings.

3.9 Maintenance

.1 Maintain finished embankment fill in condition conforming to this section until succeeding material is applied or until granular base is accepted by Contract Administrator.

END OF SECTION 31 24 13

1.0 GENERAL

.1 Section 32 91 21 refers to those portions of the work that are unique to the supply and placement of growing medium (topsoil) and subsequent finish grading. In this Section, the term "growing medium" is used in place of the generic and commonly used term "topsoil". The term "topsoil" in this Section is used where appropriate to identify imported or on-site natural material conforming to 2.4 of this Section. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 This section is based on the "British Columbia Landscape Standard" published by the B. C. Society of Landscape Architects and the B. C. Nursery Trades Association. This standard is intended to set a level of quality which is to be equalled or bettered in the construction documents for each project. Guidance of a registered British Columbia Landscape Architect is recommended.

1.1 Related Work

.1	Site Grading	Section 31 22 01
.2	Seeding	Section 32 92 20
.3	Hydraulic Seeding	Section 32 92 19
.4	Sodding	Section 32 92 23
.5	Planting of Trees, Shrubs and Ground Covers	Section 32 93 01

1.2 References

.1 British Columbia Landscape Standard.

.2 Canadian System of Soil Classification.

1.3 Source Quality Control

.1 Advise Contract Administrator of sources of growing medium to be utilized 7 days in advance of starting work.

.2 Contractor is responsible for soil analysis and requirements for amendments to supply growing medium as specified.

1.4 Measurement and Payment

.1 Payment for growing medium and imported topsoil will be made separately for each type of growing medium and imported topsoil specified, and includes supply of materials, on-site handling, placement to thickness specified, application of fertilizers and finish grading. Payment for growing medium will be by actual area provided and payment for imported topsoil will be based on loose truck box volume.

.2 Payment for placement and spreading of native topsoil previously stockpiled on site will be made under Section 31 22 01 – Site Grading - 1.4.6.

.3 Payment for excavation of native topsoil and re-use on site will be made under Section 31 22 01 – Site Grading - 1.4.2.

1.5 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12. Inspections.

2.0 PRODUCTS

2.1 General

.1 In this Section, a range of measurable physical and chemical properties are set out as being acceptable in a growing medium. Compliance with this Section is to be determined by testing for those properties. When imported or on-site soil is used, it is to be tested and modified as necessary by admixture of other components to bring its properties within ranges set in 2.10 of this Section for growing medium.

2.2 Applications

.1 Three different growing medium types are described in this Section for different applications:

.1 Low traffic lawn areas, trees and large shrubs.

.2 High traffic lawn areas, having regular pedestrian traffic. This growing medium has relatively high structural strength but will require more care due to lower water and nutrient capacity.

.3 Growing medium for planting areas, such as for shrub and ground cover areas and in planters. This growing medium is similar to that for low traffic lawn areas, but has higher organic content and slightly lower pH. This may be achieved by adding peat moss to growing medium for low traffic lawn areas.

2.3 Native Topsoil

.1 On-site native topsoil may be used, provided it meets standard set for imported topsoil and can be modified to meet requirements set out for specified growing medium.

.2 If testing shows on-site soil to be suitable for landscaping, a sufficient quantity of stripped topsoil to be stockpiled where shown on Contract Drawings or in areas specified for stockpiling.

.3 Do not handle topsoil while in a wet or frozen condition or in any manner in which structure is adversely affected.

2.4 Imported Topsoil

.1 Imported topsoil to be friable loam, neither heavy clay nor of very light sandy nature, containing a minimum of 4% organic matter for clay loams and 2% for sand loams, to a maximum of 20% by volume. To be free from subsoil, roots, noxious grass, weeds, toxic materials, stones over 30 mm, foreign objects, and with an acidity range (pH) of 5.5 to 7.5. To be free from crabgrass, couchgrass, equisetum or noxious weeds or seeds or parts thereof.

.2 Freedom from rock or debris to be such that 95 - 100% of particles pass a 25 mm sieve and 85 - 100% pass a 9.5 mm sieve.

.3 Population of any single species of plant pathogenic nematode to not exceed 1000 per litre of growing medium.

2.5 Peat Moss

.1 Peat moss to be Horticultural grade, partially decomposed fibrous or cellular stems and leaves of Sphagnum Mosses with texture varying from porous to spongy fibrous, fairly elastic and substantially homogeneous with pH value not less than 3.5 and not greater than 4.5, free of decomposed colloidal residue, wood, sulphur and iron, brown in colour and medium to coarse shredded, suitable for horticultural purposes.

.2 Salinity: saturation extract conductivity to not exceed 2.0 millimhos/cm at 25°C.

.3 Organic content: to be no less than 90% based on dry weight as determined by ash analysis.

.4 Nitrogen: to be no less than 0.8% based on dry weight.

.5 Particle size:

.1 95 - 100% passing a 9.5 mm sieve.

.2 0 - 15% passing a 0.500 mm sieve.

2.6 Sand

.1 Sand to be hard, granular sharp sand to CSA A82.50, well washed and free of impurities, chemical or organic matter.

.2 Particle size in sand to be:

.1 95 - 100% passing a 4.75 mm sieve.

.2 0 - 40% passing a 0.500 mm sieve.

.3 0 - 5% passing a 0.050 mm sieve.

2.7 Manure

.1 Manure to be well-rotted farm animal manure, rotted to extent that liquids have been eliminated, and material is crumbly, free from weed seeds, rocks, sticks, rubble and containing not more than 40% sawdust, straw or shavings.

.2 Manure to be free of harmful chemicals such as any used to artificially hasten decomposition, and to have salt content that gives an electrical conductivity reading of less than 0.5 mmho/cm.

.3 Manure to contain not less than 1.0% nitrogen based on dry weight.

.4 All particles in manure to pass a 6.35 mm sieve.

.5 Manure to be free of viable seed, maximum two plants per litre of manure.

2.8 Wood Residuals

.1 Where wood residuals such as fir or hemlock sawdust are present in growing medium, their quantities and properties to be such that total Carbon to total Nitrogen ratio is a maximum of 40:1.

.2 Cedar or redwood sawdust to not be present in growing medium.

2.9 Fertilizers

.1 Chemical Fertilizers:

.1 Fertilizers to be standard commercial brands, meeting requirements of Canada Fertilizer Act.

.2 All fertilizers to be in granular, pelleted or prill form, and to be dry, free-flowing and free from lumps.

.3 Fertilizers to have a guaranteed N-P-K analysis.

.4 Fertilizer to be packed in standard waterproof containers, clearly marked with name of manufacturer, weight and analysis.

.5 Fertilizer to be stored in weatherproof storage place and in such a manner that it will stay dry and its effectiveness is not impaired.

.6 Fertilizers to include, but not be limited to, those shown in Table 1.

TABLE 1: Fertilizers

Name	Minimum Proportion by Weight	Main Element
Ammonium Nitrate	33.5%	N
Ammonium Sulfate	21.0%	N
Superphosphate (0-20-0)	8.5%	P (20% P_2O_5)
Superphosphate (0-45-0)	19.5%	P (45% P_2O_5)
Potassium Sulfate	41.5%	K (50% K_2O)
Potassium Chloride (muriate)	50.0%	K (60% K_2O)
Potassium Nitrate	13.0%	N
	36.5%	K (44% K_2O)
Iron Sulfate	20.0%	Fe, as metallic
Gypsum	23.0%	Ca
Rock or oyster shell lime, limestone flour	40.0%	Ca
Dolomite Lime	20.0%	Ca
	13.0%	M
Bonemeal	20.0%	Phosphoric Acid
	3.0 %	N

(Bonemeal, Gypsum and limes to be finely ground, to 12 mesh or finer).

2.10 Growing Medium

.1 Growing medium is any soil, soil substitute, or mixture whose chemical and physical properties fall within ranges required by this Section for a particular application.

.2 Growing medium to be free of plants or their roots, sticks, building materials, wood chips (in excess of 10 mm in maximum dimensions), chemical pollutants, and other extraneous materials not contributing to generally desirable physical and chemical properties for landscaping purposes.

.3 Growing medium to require not more than 0.5 kg/m^2 of dolomite lime to reach required pH level.

.4 Fertility (nitrogen, phosphorous and potassium) and pH: may be modified after growing medium is placed, by incorporation of lime and fertilizers, or by incorporating these chemicals when mixing and screening.

.5 Salinity: saturation extract conductivity to not exceed 3.0 millimhos/cm at 25°C.

.6 Boron: concentration in saturation extract to not exceed 1.0 ppm.

.7 Sodium: sodium adsorption ratio (SAR) as calculated from analysis of saturation extract to not exceed 8.0.

.8 Total Nitrogen: to be 0.2% to 0.4% by weight.

.9 Available Phosphorous: to be 50 to 70 ppm.

.10 Available Potassium: to be 50 to 100 ppm.

.11 Cation Exchange Capacity: to be 30 to 50 meq.

.12 Carbon to Nitrogen Ratio: to be not more than 40:1.

.13 Acidity: to be within pH range shown in Table 2 for intended application.

.14 Texture: particle sizes and proportions of each size particle to be within ranges shown in Table 2 for intended application.

.15 Organic Content: to be within range shown in Table 2 for intended application.

.16 Drainage of growing medium can be measured only after growing medium in place. Mixing and handling or growing medium to be done in such a manner that minimum saturated hydraulic conductivity shown in Table 2 is achieved.

.17 Tolerances: samples of growing medium taken just before planting to have above properties to within tolerances of ±20%, except for salinity, which is to be less than stated limit.

TABLE 2: Properties of Growing Medium for Different Applications

Properties	Low Traffic Lawn Areas, Trees and Large Shrubs	High Traffic Lawn Areas	Planting Areas, Planters, Shrub and Groundcover Areas
TEXTURE: Particle size classes by Canadian System of Soil Classification	Percent of Dry Weight Mineral Fraction (%)		
Gravel greater than 2 mm less than 75 mm	0 - 10	0	0
Sand greater than 0.05 mm less than 2 mm	50 - 70	80 - 90	50 - 70
Silt greater than 0.002 mm less than 0.05 mm	10 - 30	5 - 20	10 - 30
Clay less than 0.002 mm	7 - 20	2 - 5	7 - 20
ACIDITY (pH)	6.0 - 6.5	6.0 - 6.5	5.0 - 6.0
DRAINAGE: Minimum saturated hydraulic conductivity (cm/hr) in place	2.0	7.0	2.0
ORGANIC CONTENT: Percent of Dry Weight (%)	5 - 10	3 - 5	25 - 30

3.0 EXECUTION

3.1 Stripping of Topsoil

.1 Strip existing topsoil in accordance with Section 31 22 01 - Site Grading.

3.2 Preparation of Subgrade

.1 Prepare subgrade in accordance with Section 31 22 01 - Site Grading.

.2 Verify that grades are correct. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.

.3 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.4 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material to approved off-site disposal area.

.5 Coarse cultivate entire area which is to receive growing medium to minimum depth of 150 mm immediately before placing growing medium. Cross cultivate areas where equipment used for hauling and spreading has compacted soil.

3.3 Processing Growing Medium

.1 Ensure commercial processing and mixing of growing medium components are done thoroughly by mechanized screening process. Do not mix by hand. Ensure resulting product is homogeneous mixture having required properties throughout.

.2 Ensure moisture content of peat moss at time of mixing not less than 50% to 75%. Peat moss to form a ball when squeezed and retain shape upon release of pressure. Insufficient moisture will result in peat moss not holding together, while excessive moisture is evident when ball formed is pliable with a clear water sheen on surface.

.3 Do not prepare or handle growing medium in a wet or frozen condition.

3.4 Placing Growing Medium

.1 When subgrade accepted by Contract Administrator commence placing growing medium.

.2 Place growing medium over prepared subgrade and allow to settle or compact by light rolling such that it is firm against deep footprints. Do not compact growing medium more than necessary to meet this requirement.

.3 Ensure growing medium is moist (25% to 75% of field capacity) but not wet when placed, and do not handle if frozen or so wet that its structure will be altered.

.4 Manually spread growing medium around trees, shrubs and obstacles.

.5 Table 3 sets out minimum depths of growing medium after settlement for various types of subgrade.

TABLE 3: Minimum Growing Medium Depths

Application	Minimum Depths		
	Over Prepared Subsoil		Over Structures
	Where subsoil has medium (loamy) texture	Where subsoil has coarse (sandy) or fine (clay) texture	
Low traffic lawn areas:			
i) irrigated	100 mm	150 mm	150 mm
ii) not irrigated	100 mm	150 mm	225 mm
High traffic lawn areas:	100 mm	150 mm	-----
Planting medium:			
i) ground cover areas	150 mm	300 mm	225 mm
ii) shrub areas - small shrubs	300 mm	450 mm	300 - 500 mm
iii) shrub areas - large shrubs	450 mm	600 mm	500 - 900 mm
iv) tree pits	225 mm on sides and bottom of rootball	300 mm on sides and bottom of rootball	See Section 02950

3.5 Applying Fertilizers

.1 Add fertilizers to bring growing medium fertility within ranges set out in this Section.

.2 Add lime (if required) and potassium (if required) to growing medium at time of screening. Add all other fertilizers (such as nitrogen, phosphorus and micronutrients) to growing medium by thorough cultivation after medium is in place (if required).

.3 Spread fertilizers evenly over growing medium with suitable mechanical spreader.

.4 Ensure fertilizers are fully incorporated to minimum depth of 150 mm, except in lawn areas, where they are to be incorporated to depth of 50 mm.

.5 Minimum one week separation between application of lime and fertilizers other than lime.

3.6 Finished Grading

.1 Fine grade growing medium after placing to specified areas to ensure positive surface drainage.

.2 Finish surface smooth, uniform, firm against deep footprinting with a fine loose surface texture.

3.7 Acceptance

.1 Contract Administrator will inspect and test growing medium in place and determine acceptance of material, depth of growing medium and finish grading. Approval of growing medium material subject to soil testing and analysis.

3.8 Restoration of Stockpile Sites

.1 Restore stockpile sites as specified in Contract Documents.

3.9 Clean-up

.1 Dispose of surplus materials and all construction debris off-site.

END OF SECTION 32 91 21

1.0 GENERAL

.1 Section 32 92 19 refers to those portions of the work that are unique to the supply and application of grass seed by hydraulic methods. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

.2 This section is based on the "British Columbia Landscape Standard" published by the B. C. Society of Landscape Architects and the B. C. Nursery Trades Association. This standard is intended to set a level of quality which is to be equalled or bettered in the construction documents for each project. Guidance of a registered British Columbia Landscape Architect is recommended.

1.1 Related Work

.1	Site Grading	Section 31 22 01
.2	Topsoil and Finish Grading	Section 32 91 21
.3	Seeding	Section 32 92 20
.4	Sodding	Section 32 92 23
.5	Planting of Trees, Shrubs and Ground Covers	Section 32 93 01

1.2 References

.1 British Columbia Landscape Standard.

.2 Canadian System of Soil Classification.

1.3 Scheduling

.1 Schedule all operations to ensure optimum environmental protection, grading, growing medium placement, planting, seeding or sodding operations as outlined in these Specifications. Organize scheduling to ensure a minimum duration of on-site storage of plant material, minimum movement and compaction of growing medium, and prompt mulching and watering operations. Coordinate work schedule with scheduling of other trades on-site.

.2 Coordinate and schedule such that no damage occurs to materials before or after placement. In particular, meet requirements of living plant material.

.3 Plan, schedule and execute work to ensure a supply of water for landscape purposes in adequate amounts and at adequate pressures for satisfactory irrigation of all plants.

1.4 Handling and Storage

.1 Store all grass seed and nurse crop seed, hydraulic mulch, fertilizers and related materials, where required, in dry, weatherproof storage place and protect from damage by heat, moisture, rodents or other causes until time of seeding. Do not remove or deface labels or other identification.

1.5 Drainage Control

.1 Provide proper water management and drainage of site during construction. Include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance during construction period.

1.6 Samples

.1 Provide samples of all materials required, handle and ship in such a manner that they are representative of material or product sampled.

1.7 Site Examination

.1 Do not carry out landscaping work in areas or over surfaces that are not properly prepared. Examine site before starting work to verify all surfaces are properly prepared.

1.8 Measurement and Payment

.1 Payment for hydraulic seeding includes the necessary equipment and supply and application of hydraulic mulch, grass seed and maintenance to meet Conditions of Total Performance per 3.9 of this Section.

.2 Measurement for payment will only be made for surface actually seeded. Areas of overseeding onto existing grass or sod will not be measured for payment.

.3 Payment for erosion control blanket covers the types of blankets and methods of application as specified and includes necessary blanket, pegging down and maintenance to meet Conditions of Total Performance per 3.9 of this Section.

1.9 Inspection and Testing

.1 Refer to General Conditions, Clause 4.12, Inspections.

2.0 PRODUCTS

2.1 Grass Seed

.1 Grass seed to meet requirements of Canada Seed Act for Canada No. 1 seed. Where specified, all nurse crop seed to meet requirements of Canada Seed Act for Canada No. 1 seed.

.2 Seed mixtures to be approved by Contract Administrator and to be suited to climate, terrain, establishment and maintenance conditions under which they are to be grown.

.3 Seed to have minimum germination rate of 75% and minimum purity of 97%, except where otherwise required by professional selecting seed mixture.

.4 Seed to be packed and delivered in original containers clearly showing:

.1 Name of supplier.

.2 Analysis of seed mixture.

.3 Percentage of pure seed.

.4 Year of production.

.5 Net weight (mass).

.6 Date and location of bagging.

.5 Mixture to be mixed and supplied by recognized seed house.

2.2 Hydraulic Mulch

.1 Hydraulic mulch to consist of fibre or other material designed for hydraulic seeding and dyed for ease of monitoring application

.2 Hydraulic mulch to be capable of dispersing rapidly in water to form homogeneous slurry and remaining in such state when agitated or mixed with other specified materials. When applied, hydraulic mulch to be capable of forming absorptive mat, which will allow moisture to percolate into underlying soil and to contain no growth or germination inhibiting factors. Mulch to be dry, free of weeds and all other foreign material, and to be supplied in packages bearing manufacturer's label clearly indicating weight and product name.

.3 Mulch may contain a colloidal polythacuride (or equivalent) tackifier, which is to be adhered to mulch to prevent separation during shipment and to avoid chemical agglomeration during mixing in hydraulic mulching equipment.

2.3 Water

.1 Free of impurities that would inhibit germination and growth or may be harmful to environment.

.2 Contractor to supply.

2.4 Fertilizer

.1 To Section 32 91 21 - Topsoil and Finish Grading – 2.9.

3.0 EXECUTION

3.1 Finish Grade Preparation

.1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice or standing water or when wind exceeds 10 km/h.

.2 Verify that grades are correct. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.

.3 Remove and dispose of weeds; debris; soil contaminated by oil, gasoline and other deleterious materials; to approved off-site disposal area.

.4 Loosen surface areas that are excessively compacted by means of thorough scarification, discing or harrowing, to minimum 150 mm depth.

.5 Finish grade smooth to extent required for class of seeding to be carried out, firm against footprints, loose textured, and free of all stones, roots, branches, etc. larger than diameter required for removal for class of seeding to be carried out.

3.2 Seeding - General

.1 Scheduling: carry out seeding during periods that are most favourable for establishment of healthy stand of grass. Seed only during calm weather and on soil that is free of frost, snow and standing water, when seasonal conditions are likely to ensure successful germination and continued growth of all varieties of seed in grass mix.

.2 Rates of Application: rates of application of fertilizers, seed mixtures, mulch and other components to be based on analysis of season, climate, terrain, soil, and establishment and maintenance conditions affecting project.

3.3 Equipment

.1 All hydraulic seeding/mulching equipment to equipment and not to be removed or altered.

.2 Hydraulic seeder/mulcher to be capable of sufficient agitation to mix materials into homogeneous slurry and to maintain slurry in homogeneous state until application. Discharge pumps and gun nozzles to be capable of applying materials uniformly over designated areas.

3.4 Protection

.1 Carry out hydraulic seeding with care to ensure fertilizer in solution does not come in contact with foliage of any trees, shrubs or other susceptible vegetation. Do not spray seed or mulch on objects not expected to grow grass.

.2 Protect existing site equipment, roadways, landscaping, reference points, monuments, markers and structures from damage.

.3 Promptly rectify any overspray or damage that occurs during hydraulic seeding.

3.5 Application for Hydraulic Seeding

.1 Thoroughly mix seed, fertilizer and hydraulic mulch in water slurry and distribute normally over surface area with approved hydraulic mulcher.

.2 Measure quantities of each material to be charged into hydraulic seeder/mulcher tank accurately either by mass or by commonly accepted system of mass-calibrated volume measurements. Add materials to tank while it is being filled with water and in following sequence: seed, fertilizer, and where applicable, mulch. Thoroughly mix materials into homogeneous water slurry and distribute uniformly over surface area with hydraulic seeder/mulcher.

.3 Keep seeds for grass and legumes in separate containers prior to seeding.

.4 If required, add legume seed to grass mixture at time of seeding. Inoculate legume seed with standard product humus culture before mixing with grass seed. Protect inoculated seed from exposure to sunlight for periods of over one-half hour. Use seed within eight hours from inoculation or to be re-inoculated.

.5 After charging, do not add water or other material to mixture in hydraulic mulcher.

.6 Do not leave seed, fertilizer, mulch and water slurry in tank for more than 4 h. Slurry left in tank over maximum time to not be used for seeding, dispose off-site.

.7 If required, apply wild flower seed following grass hydroseeding.

3.6 Erosion Control Blanket

.1 Apply blanket over designated areas in accordance with manufacturer's instructions.

.2 Anchor blanket in accordance with manufacturer's recommendations which are to be used as minimum standard and ensure that blanket is held down to maintain firm contact with soil.

3.7 Clean-up

.1 Remove all materials and other debris resulting from seeding operations from job site.

3.8 Grass Maintenance

.1 Begin maintenance for seeded areas immediately after seeding has been completed, and continue until issuance of Certificate of Total Performance.

.2 Include all measures necessary to establish and maintain grass in a vigorous growing condition, including, but not limited to, following:

.1 Mow at regular intervals as required, to maintain grass at maximum height of 60 mm. Do not cut more than 1/3 of blade at any one mowing. Neatly trim edges of seeded areas. Remove heavy clippings immediately after mowing and trimming.

.2 Water when required and with sufficient quantities to prevent grass and underlying soil from drying out.

.3 Roll when required to remove any minor depressions or irregularities.

.4 Undertake weed control when density of weeds reaches 10 broadleaf weeds or 50 annual weeds or weedy grasses per 40 m^2 and reduce density of weeds to zero.

.5 Immediately repair seeded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches original seed mix.

.6 Protect all seeded areas with warning signs, temporary wire or twine fences, or other necessary means.

3.9 Conditions for Total Performance

.1 Contract Administrator will issue Certificate of Total Performance only when following conditions exist:

.1 Growing medium quality, fertility levels, depths and surface conditions are as specified in Contract Documents.

.2 Grasses are required varieties, free of varieties other than those specified.

.3 Grass areas are relatively free of weeds, containing no more than two broadleaf weeds or ten annual weeds or weedy grasses per m^2.

.4 Grass is sufficiently established that its roots are growing into underlying growing medium.

.5 Seeded areas have been mown at least twice, to a height of 38 mm, last mowing being within 48 h of inspection for acceptance.

.6 Grasses established in sufficient density that no surface soil visible when mown to height of 38 mm.

.7 Specified maintenance procedures have been carried out.

3.10 Guarantee / Maintenance

.1 Customary one year guarantee period for construction industry will apply as standard for landscape work. Contractor to guarantee all materials and workmanship for a period of one full year from date of Total Performance, unless specified otherwise in Contract Documents.

.2 Guarantee includes replacing all seeded areas determined by Contract Administrator to be dead or failing at end of guarantee period. Replacements to be made at next appropriate season, and conditions of guarantee will apply to all replacement seeding for one full growing season.

.3 Guarantee will not apply to seeded areas damaged after date of Total Performance by causes beyond Contractor's control, such as vandalism, "acts of God", "excessive wear and tear", or abuse. Contractor is responsible for work until Total Performance. After Total Performance, Owner is responsible for work and proper maintenance.

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END OF SECTION 32 92 19

APPENDIX B - DRAWINGS

REGIONAL DISTRICT
of Fraser-Fort George

ITT ES-20-18

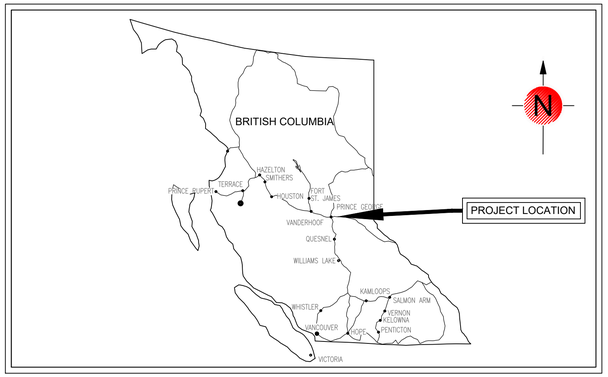
TABOR LAKE LAGOON EMBANKMENT REHABILITATION

APPENDIX B

Drawings

SITE PLAN
Scale: 1:2000

DRAWING INDEX	
C001	KEY PLAN, SITE PLAN, LEGEND, INDEX, & GENERAL NOTES
C101	PLAN
C102	DETAILS
C103	SECTIONS



KEY PLAN
NOT TO SCALE

GENERAL NOTES:

1. ELEVATIONS ARE GEODETIC AND ALL COORDINATES REFERENCED IN UTM ZONE 10 NAD 83 DATUM (METRES). ALL MEASUREMENTS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
2. REFER TO GEOTECHINCAL MATERIAL SPECIFICATOIN FOR INFORMATION ON MATERIALS, PLACEMENT AND COMPACTION.
3. STRIP AND STOCKPILE TOPSOIL IN APPROVED AREAS FOR LATER PLACEMENT ON FINISHED AREAS.
4. ALL DISTURBED AREAS TO BE REVEGETATED BY HYDROSEEDING.
5. MINIMIZE EROSION AS PER BEST PRACTICES DURING CONSTRUCTION.

LEGEND

- EXISTING CONTOUR
- EXISTING TOP OF BANK
- EXISTING TOE OF SLOPE
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING SPOT ELEVATION (+ 1.23)
- NEW CONTOUR
- NEW TOP OF BANK
- NEW TOE OF SLOPE
- FINISHED ELEVATION (1.50)

1:1 @ ANSI D — 0 10 20 30 40 50 60 70 80 90 100 mm

Revision	Amendment	Approved	Revision Date
0	ISSUED FOR TENDER	JH	2020/07/16

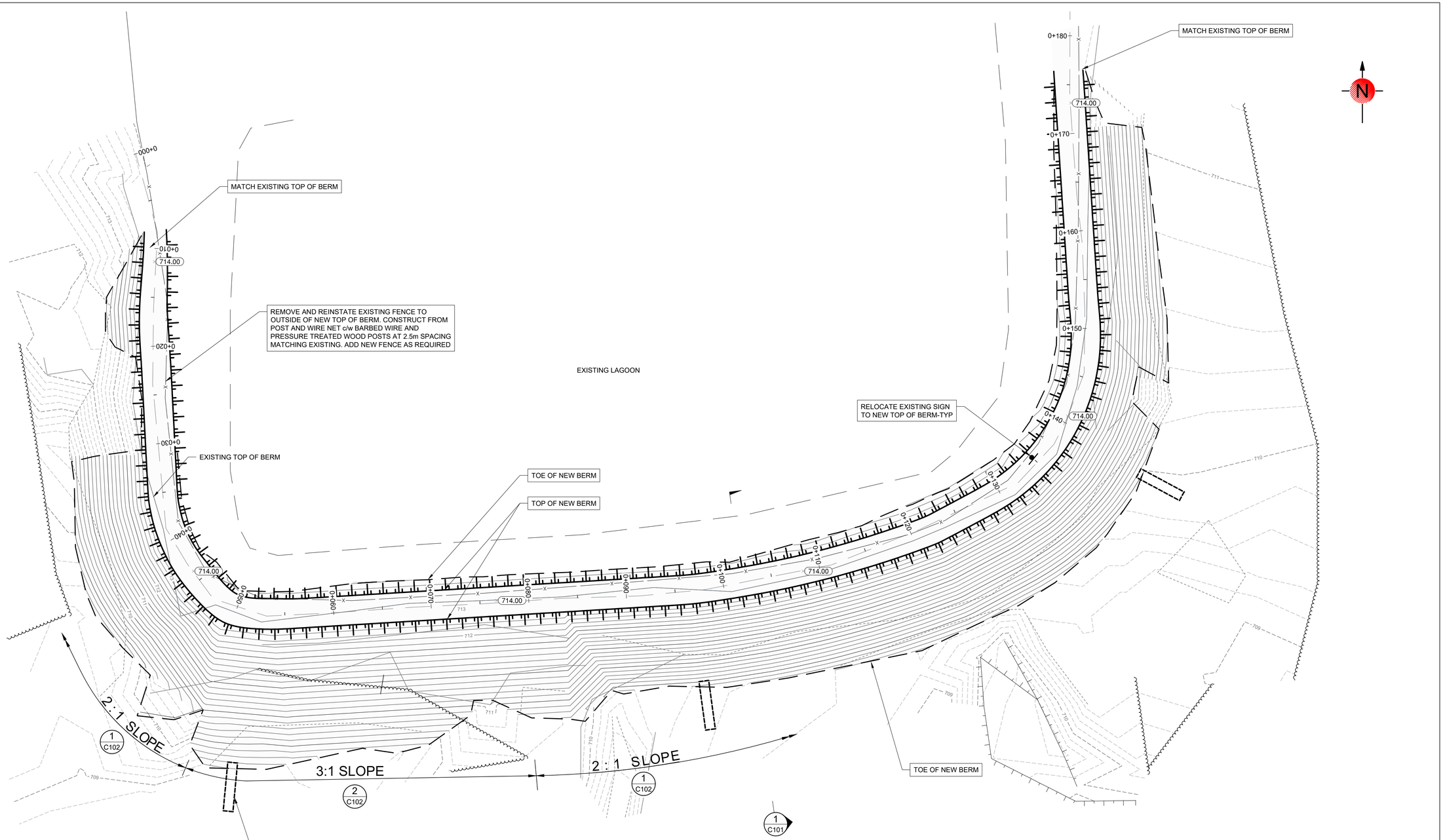
Prince George Office
+1 250-562-0038
201-1110 6th Avenue
Prince George BC
V2L 3M6, Canada

Designed	Approved	Approved Date
JH		JULY 2020
Drawn	Scales	
EK	AS SHOWN	

Project: REGIONAL DISTRICT OF FRASER-FORT GEORGE
TABOR LAKE LAGOON

Sheet: KEY PLAN, SITE PLAN, LEGEND, INDEX, & GENERAL NOTES

Project No.	Sheet. No.	Revision
20P-00091-00	C001	0



PLAN

Scale: 1:250

Revision	Amendment	Approved	Revision Date
0	ISSUED FOR TENDER	JH	2020/07/16

wsp
Prince George Office
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201-1110 6th Avenue
Prince George BC
V2L 3M6, Canada

Designed	Approved	Approved Date
JH		JULY 2020

Drawn	Scales
EK	1:250

Project: REGIONAL DISTRICT OF FRASER-FORT GEORGE
TABOR LAKE LAGOON

Sheet: PLAN

Project No.	Sheet. No.	Revision
20P-00091-00	C101	0

1:250 @ ANSI D
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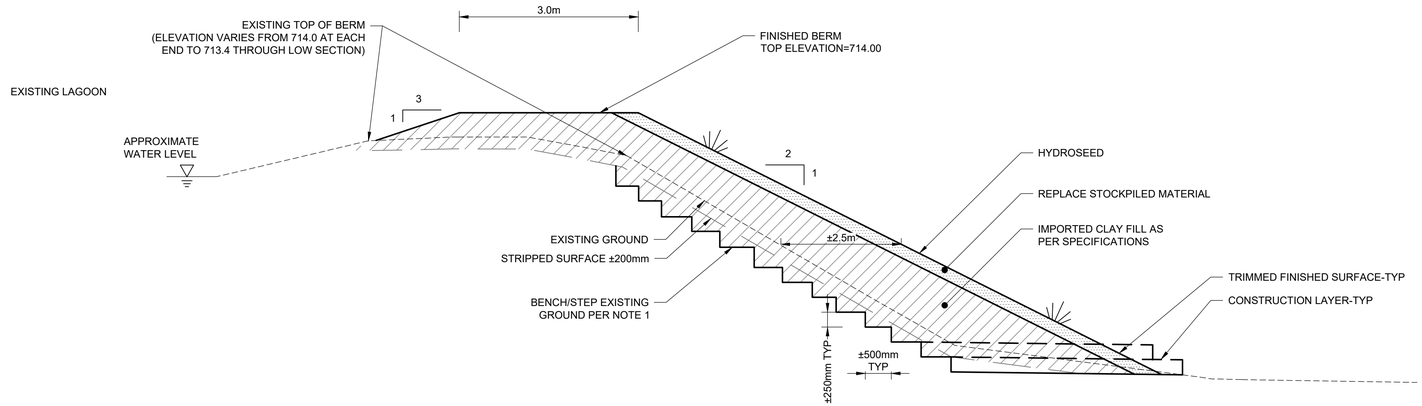


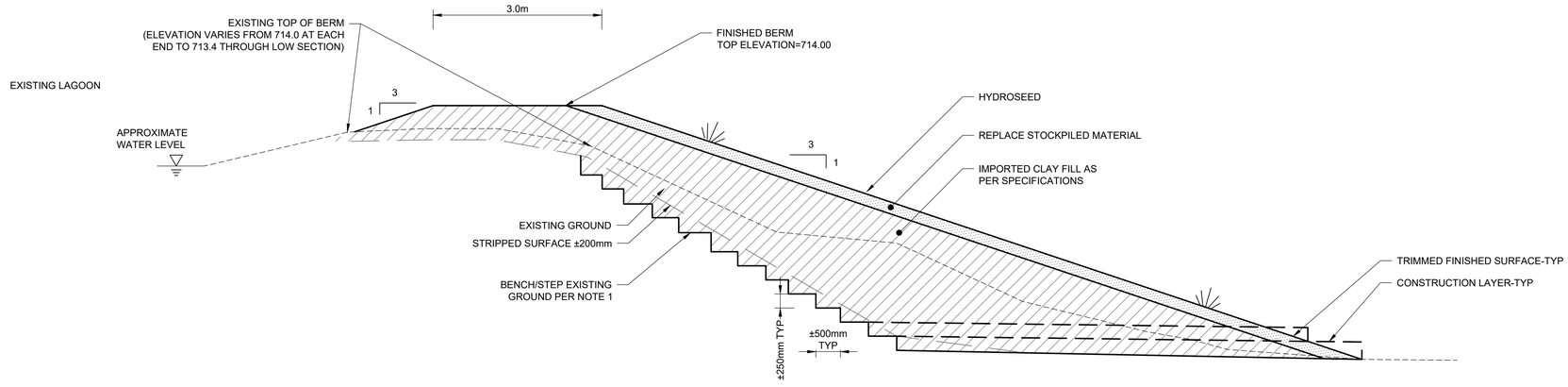
NOTES:

1. BENCHING OF THE SIDE SLOPES REQUIRES STEPPED SURFACE TO ENSURE ADEQUATE BONDING BETWEEN OLD AND NEW LAYERS. STEPPED BENCHING DIMENSIONS TO BE 250± DEEP BY 500± WIDE.
2. CLEAR AND GRUB ORIGINAL GROUND SURFACE TO 200±. SUB-EXCAVATE AND STOCKPILE UNSUITABLE AND ORGANIC MATERIAL PRIOR TO PLACING FILL.
3. SPREAD STOCKPILED TOPSOIL EVENLY ACROSS THE TOP AND FACE OF EMBANKMENTS AND TAMP LOOSELY AND HYDROSEED.

TYPICAL SECTION STA 0+000 TO 0+050 AND STA 0+090 TO END

Scale: 1:50

1 / C101



TYPICAL SECTION STA 0+050 TO 0+090

Scale: 1:50

2 / C101

Revision	Amendment	Approved	Revision Date
0	ISSUED FOR TENDER	JH	2020/07/16

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Designed	Approved	Approved Date
JH		JULY 2020
Drawn	**Scales**	
EK	AS SHOWN	

Project: REGIONAL DISTRICT OF FRASER-FORT GEORGE
TABOR LAKE LAGOON

Sheet: DETAILS

Project No.	Sheet. No.	Revision
20P-00091-00	C102	0

1:250 @ ANSI D
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300 mm
200
100
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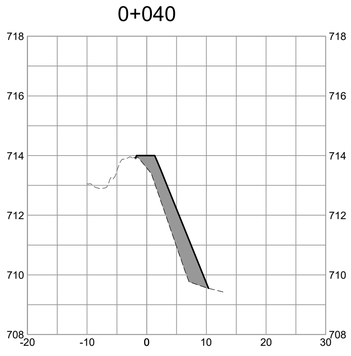

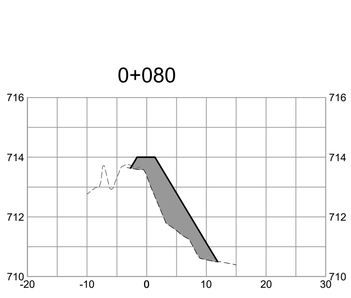

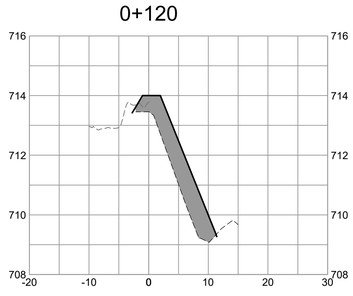

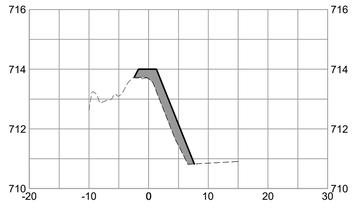

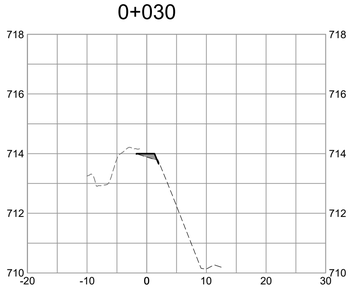

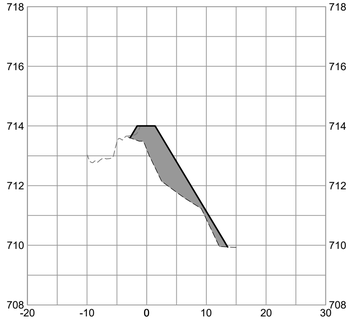

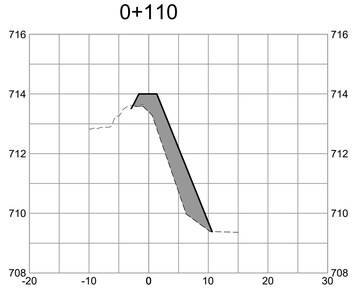

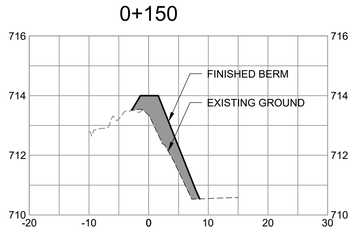

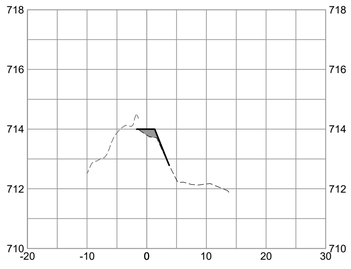

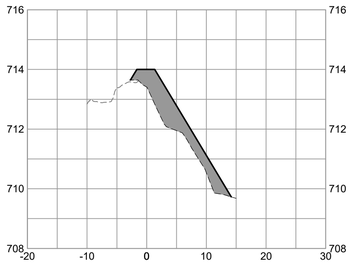

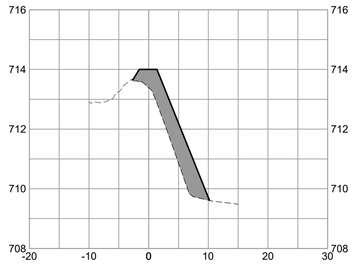

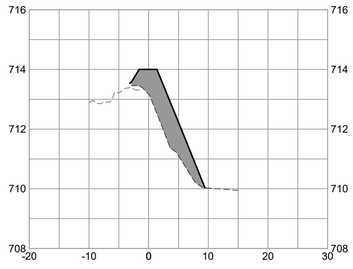

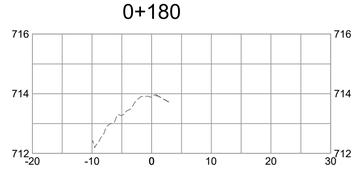

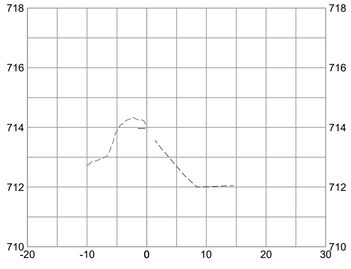

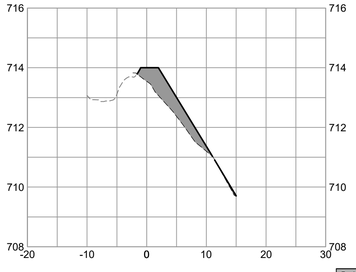

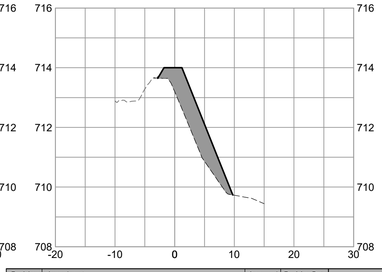

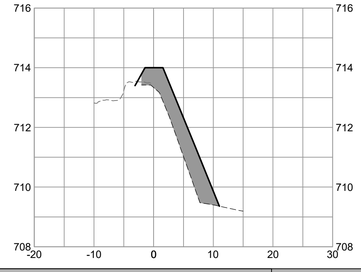

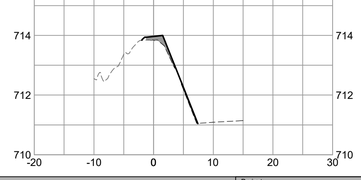

Revision	Amendment	Approved	Revision Date
0	ISSUED FOR TENDER	JH	2020/07/16

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201-1110 6th Avenue
Prince George BC
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Designed	Approved	Approved Date
JH		JULY 2020

Drawn	Scales
EK	H1:500 V1:100

Project
REGIONAL DISTRICT OF FRASER-FORT GEORGE
TABOR LAKE LAGOON

Sheet
SECTIONS

Project No.	Sheet. No.	Revision
20P-00091-00	C103	0

Original Sheet Size ANSI D [22"x34"] Plot Date 2020-07-17 at 3:50:52 PM Path M:\RDFFG\20P-00091-00\(C) Civil\20P-00091-00 TABOR LAGOON Design_1.dwg C103

APPENDIX C - CONTRACT AGREEMENT AND GENERAL CONDITIONS

(MMCD will form part of the final contract)

APPENDIX D - SUPPLEMENTAL GENERAL CONDITIONS

REGIONAL DISTRICT
of Fraser-Fort George

ITT ES-20- 18

TABOR LAKE LAGOON
EMBANKMENT REHABILITATION

APPENDIX D

Supplementary General Conditions

REGIONAL DISTRICT of Fraser-Fort George

REGIONAL DISTRICT OF FRASER-FORT GEORGE
ITT ES-20- 18
TABOR LAGOON EMBANKMENT REHABILITATION

Supplemental General Conditions

The ITT and the MMCD overlap on various clauses. Where this occurs, the conditions in the ITT will take precedence**.**

SGC 1
Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 3.0 Contract Administration

3.3 Contract Administration

3.3.5 Delete this clause and replace with the following:

3.3.5 Unless otherwise specified in the Contract Documents, the Contract Administrator shall set out or cause to be set out survey monuments or control points at the Place of the Work, sufficient to enable the Contractor to determine the required lines and grades, and to set out the Work. The Contractor shall protect and preserve such monuments and control points for so long as they are required for the Work and if any of them must be replaced because they are disturbed or destroyed by the Contractor, then the Contractor shall pay the costs of such replacement.

To 3.3.5, add the following:

Add: The Contractor shall be responsible for survey layout required for the installation and construction of the lagoon embankment rehabilitation. The Contractor shall furnish all assistance necessary to measure-in and drive stakes and shall furnish such lines, straight edges, and stakes for locating line and grade.

Add: The Contractor shall, before commencing work at any point, satisfy himself as to the meaning and correctness of all stakes and works and no claims shall be entertained for any allowances based on alleged inaccuracies or for alternatives on account of his failure to read same correctly.

Add: If the Contractor, in the course of the work, finds any discrepancy between the drawings and the physical conditions of the locality or any errors or omissions in drawings or in the layout as given by points and instructions, it

shall be his duty to immediately inform the Engineer, in writing, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized will be done at the Contractor's risk.

SGC 2

Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 4.0 Contractor

4.12 Tests and Inspections

4.12.4 Delete this clause and replace with the following:

4.12.4 The Contractor shall as part of the Work perform, or cause to be performed, all tests, inspections, and approvals of the Work as required by the Contract Documents, and if a test, inspection or approval requires a representative sample of materials or workmanship the Contractor shall at the Contractor's own cost supply the labour and materials necessary to provide the sample.

To 4.12.4, add the following:

Add: The Contractor shall be required to perform all Standard Proctor Density tests in compliance with ASTM D1557 for compaction of trench, 'roads', and embankments. Frequency of tests is as indicated in the contract document. Additional tests may be requested by the Contract Administrator. Payment for the inspection and testing is provided for in the Measurement and Payment section. If initial tests determine materials or compaction is not as specified, the Contractor to take all the necessary steps to correct deficiencies. Subsequent testing to Contractor's account.

SGC 3

Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 18.0 Payment

Delete this clause in its entirety and replace with the entire Clause 11 "Payment" of Part 1, the Invitation to Tender.

SGC 4

Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 20.0 Laws, Notices, Permits and Fees

Delete this clause in its entirety and replace with the entire Clause 29.0 "Permit and Regulations" of Part 1, the Invitation to Tender.

SGC 5

Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 21.0 Workers Compensation Regulations

to the clauses of this section, add clause 21.4, as follows:

21.4 Worksafe BC
Add Clause 15 "Worksafe BC" of Part 1, the Invitation to Tender.

SGC 6
Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 22.0 Indemnification
Clause 22.1 Contractor to Indemnify
Delete Clause 22.1 and replace with Clause 16.0 "Indemnity and Release by Contractor" of Part 1, the Invitation to Tender.

SGC 7
Refer to the MMCD General Conditions of Contract, which apply to this Contract:

Clause 24.0 Insurance
Delete this clause in its entirety and replace with the entire Clause 13 "Insurance" of Part 1, the Invitation to Tender.

SGC 8
This Supplemental Condition provides for the mechanism of measurement and payment of the work. This section shall take precedence over Measurement and Payment clauses which may appear in other sections of this document including Measurement and Payment descriptions within individual sections of the MMCD document.

Measurement and Payment Section

Description of Pay Items
The Sections, titles and numbering of the items which follow match the numbering in the Schedule of Quantities and Prices which appears in Part 1 of these documents, the Invitation to Tender. They describe the basis of the measurement and payment of individual items of work or payment for contract requirements. The completed work of this Contract shall be measured and paid for in accordance with this Section.

Each item shall include all transport, labour, material, equipment, and work necessary to provide a completed item, as specified. It shall include all things necessary to provide the completed item, even if not minutely detailed.

SECTION 1: GENERAL
Item 1.0 Mobilization and Demobilization

.1 This item refers to the cost of mobilizing / transporting the work force, equipment and materials to site to commence the work, including work associated with Temporary Facilities, permits, temporary communications, electrical or water supply and again

at the end of the project after commissioning to remove all temporary facilities from site and leave the site in an 'as found' condition.

.2 Payment will be made as follows:
- 60% of the item price at the start of the actual construction
- 40% at the end of the project after the site has been vacated

Item 1.1 **Insurance, Bonding, Safety Program, Env Protection, etc.**

.1 This item refers to all the 'soft costs' associated with the project, including but not limited to Insurance, Bonding, Workers Compensation contribution, Environmental Protection, Safety Programme, Traffic Regulation, Project Documentation, Meetings, Reference Specifications, set-out, maintaining record drawings, overheads, operational costs and the like, necessary to run and manage the project but not included in pay items elsewhere.

.2 Payment for this item will be made as follows:
- 40% of the item price after award and prior to the start of construction
- The remaining 60% will be paid as a ratio of the value of the work completed at the end of a pay period, under Sections 2 and 3, compared to the sum of Section 2 and 3 amounts in the original tender, or as adjusted by change orders.

Item 1.2 **Materials Testing**

.1 This item refers to the initial and subsequent testing of the supplied material and the compaction testing that is required during construction.

.2 If a materials or compaction test determines materials or compaction are not as specified, the Contractor shall take the necessary steps to correct deficiencies. The cost of subsequent testing shall be to the Contractor's account.

.3 Payment for this item will be made for initial tests which do not fail, paid as a ratio of the value of the work completed at the end of a pay period, under Sections 2 and 3, compared to the sum of Section 2 and 3 amounts in the original tender, or as adjusted by change orders.

SECTION 2: SITE PREPARATION

Item 2.0 **Remove Fencing and Later Reinstatement**

.1 This item refers to the removal of the existing fence affected by the area of the work and its later reinstatement.

.2 Measurement for removal and reinstatement will be the length in linear metres of the existing fence impacted by the work requiring removal – roughly station 0 +000 to 0 +180. Fence removed, not in the area of the work, will not be measured for payment, but shall be replaced.

.3 Payment for fence removal and reinstatement includes careful removal of fence and its storage during construction, together with reinstatement on completion of the work. Loss or damage will not be paid for separately.

Item 2.1 **Remove Signage and Later Reinstatement**

.1 This item refers to the removal of the existing lagoon signs within the area of the work and their later reinstatement.

.2 Measurement for removal and reinstatement will be for each sign removed and replaced – each (ea.).

.3 Payment for sign removal and reinstatement includes careful removal of the signs, their storage during construction, together with reinstatement on completion of the work. Loss or damage will not be paid for separately.

Item 2.2 **Exploratory Test Pits**

.1 This item refers to the three exploratory test pits (for Geotechnical confirmation) to be completed and backfilled in advance of clay placement commencing.

.2 Measurement of the trenches shall be for each trench excavated and backfilled – each (ea).

.3 Three trenches are scheduled, each 5m long, by 1.5m deep, by 1m wide but may vary according to findings and as directed by the Geotechnical engineer. Allow for a variation of 40% in any one of these dimensions. Payment shall be for the completed trench.

SECTION 3: SITE WORKS

Item 3.0 Grub, Strip and Stockpile

.1 This item refers to the grubbing, stripping and stockpiling of organic material before clay placement can commence, to the depth indicated on the drawings or as agreed in the field.

.2 Measurement for grub, strip and stockpile shall be by the cubic metre of the stripped area (m^3) of the work zone to receive clay, shown on Contract Drawings.

Measurement of the volume shall be derived from the surface area of the location where the Contractor intends to stockpile the stripping and the surface area of the stockpile once stripping is completed. The Contractor shall supply the before and after surfaces in a .csv survey file, with calculation by the Contract Administrator's Civil 3D software.

.3 Payment for grub, strip and stockpile includes removal and disposal of all branches, stumps and timbers, or any similar material found in the stripping layer. Payment shall include stockpiling adjacent to the cleared area at a location to be agreed with the Contract Administrator.

Material stripped below the organic strip line will not be paid for and the required clay replacement shall be to the Contractor's account.

Item 3.1 Supply, place, compact and trim imported clay

.1 This item refers to the supply and placement of clay, as indicated on the drawings. The quantity indicated in the tender is a mathematically calculated quantity and does not account for shrinkage or swell the clay.

.2 Measurement shall be by the cubic metre (m^3) of compacted clay, in place.

Measurement of the volume shall be derived from the surface after stripping and the surface of the completed trimmed clay, prior to replacing the topsoil stockpile. The Contractor shall supply the before and after surfaces in a .csv survey file, with calculation by the Contract Administrator's Civil 3D software.

.3 Payment shall be made on the calculated volume and the unit price tendered for the supply, placement, compaction and trimming of imported clay.

Payment shall be made on the lines and grades indicated on the drawings; additional, placed clay will not be paid for.

Item 3.2 **Post and Wire Net Fence**

.1 This item refers to the supply and placement of new post and wire net fence. More fence will be required than exists, because of the embankment construction. This item provides for that shortfall.

.2 Measurement shall be by the linear metre (l.m.) of the new fence in place.

.3 Payment shall be made on the completed fence, as specified, measured in place.

Item 3.3 **Spread Stripping Stockpile and Hydroseed**

.1 This item refers to reuse and placement of the stockpiled stripping pile and its hydroseeding.

.2 Measurement shall be by the square metre (m^2) of the completed trimmed clay surface, as determined in 3.1 above.

.3 Payment shall be made on the calculated area and the unit price tendered for the transport, placement and spreading of the stripping stockpile and the applied hydroseed as specified.

*** END SUPPLEMENTAL GENERAL CONDITIONS ***