



# **Bid Documents for Phase 2 MSW Area Closure**

**Terrace Landfill, Terrace, BC**

City of Terrace

7 March 2022

# Table of Contents

## Instructions to Bidders

CCDC 4

CCDC 41

## Special Conditions

## Form of Bid

## Project Specifications

### Division 01

Section 01 10 00

Section 01 20 00

Section 01 30 00

Section 01 33 00

Section 01 35 29.14

Section 01 40 000

Section 01 50 00

Section 01 60 00

Section 01 70 00

Summary

Price and Payment Procedures

Administrative Requirements

Submittal Procedures

Health and Safety

Quality Requirements

Temporary Facilities and Controls

Product Requirements

Execution and Closeout Requirements

### Division 02

Section 02 56 13.16

Section 02 66 16

Geosynthetic Clay Liner

Landfill Gas Vents

### Division 31

Section 31 05 19.13

Section 31 10 00

Section 31 23 16

Section 31 23 23

Section 31 25 00

Geotextiles for Earthwork

Site Removals

Excavation

Fill

Erosion and Sedimentation Controls

### Division 32

Section 32 92 19

Topsoil and Seeding

### Division 33 - Utilities

Section 33 05 13

Section 33 42 13

Manholes

Pipe Culverts

## Drawings

# Instructions to Bidders

## Instructions to Bidders

### **Ib.01 Invitation**

#### 1.1 Time and Date of Bid Closing

- A. Offers signed under seal, executed, and dated will be received by City of Terrace (City or Owner) via email at [amaher@terrace.ca](mailto:amaher@terrace.ca), Attn: Ann Maher, before 3:00 p.m. local time on Wednesday, April 19, 2023. Offers must be labelled with:
1. Bidder's name, address, contact person, phone number
  2. Date of submission
  3. "Bid Documents: Phase 2 MSW Area Closure, Terrace Landfill, Terrace, British Columbia, City of Terrace"
  4. Due date and time of bid.
- B. Bids must be submitted electronically.
- C. Offers will be opened privately.
- D. Amendments to submitted offer will be permitted if received in writing prior to bid closing and if endorsed by same party or parties who signed and sealed offer.

### **Ib.02 Submission of Bids**

- 2.1 Intent of this Bid call is to obtain an offer to perform work to complete the Phase 2 MSW Area Closure, Terrace Landfill, Terrace, British Columbia, City of Terrace (hereinafter referred to as Site) for a lump sum and unit price Contract in accordance with the Contract Documents. A summary of the work is provided in Section 01 10 00 of the Contract specifications contained herein. Work must occur in accordance with applicable Laws and Regulations.
- 2.2 Contractor is to have all work under this Contract completed including restoration, cleanup, demobilization and submittal and approval of all submittals required from Contractor, on or before September 30, 2023.

### **Ib.03 Contract Documents Identification**

- 3.1 Not used.

### **Ib.04 Contract/Bid Documents**

- 4.1 Agreement Form: CCDC 4 Unit Price Contract 2011.
- 4.2. Definitions
- A. Contract Documents: Defined in CCDC 4 Unit Price Contract 2011, Definitions.
- B. Bid Documents: Contract Documents supplemented with Instructions to Bidders; Bid Supplementary Forms identified herein.

- C. Bid, Offer, or Bidding: Act of submitting an offer under seal.
- D. Bid Price: Monetary sum identified in Bid Form as an offer to perform work.

4.3 Availability

- A. Bid Documents can be obtained from BC Bid.
- B. Bid Documents are made available only for purpose of obtaining offers for this project. Their use does not confer license or grant for other purposes.

4.4. Examination

- A. Upon obtaining the Bid Documents, verify that documents are complete.
- B. Immediately notify the Consultant upon finding discrepancies or omissions in Bid Documents.

4.5. Queries/Addenda

- A. Direct questions by e-mail to the attention of the GHD and copy the City to the following contacts:

GHD Limited  
Attn: Dave Engstrom  
[Dave.Engstrom@ghd.com](mailto:Dave.Engstrom@ghd.com)

City of Terrace  
Attn: Ann Maher  
[amaher@terrace.ca](mailto:amaher@terrace.ca)

- B. Addenda may be issued during bidding period. All addenda become part of Contract Documents.
- C. Verbal answers are only binding when confirmed by written addenda.
- D. Clarifications requested by bidders must be in writing not less than 5 business days before date set for receipt of Bids. Reply will be in form of an addendum, a copy of which will be posted on the BC Bid.

4.6. Drawings and Specifications

- A. The drawings hereinafter referred to shall be those listed in these specifications, together with such other working and detailed drawings as may be issued by the Owner or Consultant during the progress of the work.
- B. It is the intention that the work shown on the drawings and/or called for in the specifications shall complete the contract in every respect. The submission of a Tender shall constitute an undertaking to do all work required to complete the contract to the full intent and meaning of the drawings and the specifications.
- C. Each Bidder, before submitting their tender, shall carefully examine the contract documents including drawings and specifications. No extra compensation will be allowed for expenses incurred during the progress of work through failure, by the

Contractor, to study drawings and specifications and make the necessary provisions in their tender price.

4.7. Information Furnished and Available to Bidders

- A. Any information and data furnished and made available to Bidders will not form part of the Contract and is not intended as a representation or warranty but is furnished in order that bidders may have access to the same information which is available to Owner. Neither Owner nor Consultant will be responsible for any deduction, interpretation, or conclusion drawn from any information and data furnished or available to bidders.

**Ib.05 Materials**

- 5.1 Bidder shall submit their tender based on materials and equipment specified. Materials, as specified, are to be considered minimum required quality.
- 5.2 Requests by Bidders for substitute or or-equal approval shall be submitted in writing to Consultant at least 10 business days prior to the date of bid closing.
- 5.3 If a substitute or or-equal request is approved by Consultant, each prospective Bidder will be notified by Addenda. Bidders shall not rely on any other manner of substitute or or-equal approval. No substitutes or or-equals will be considered unless approved in writing by Consultant. Work not conforming to the Contract Documents, including substitutes or or-equals not properly approved, will be considered *defective*. Substitutes or or-equals not properly approved may be required to be replaced with the named material or equipment at no additional cost to Owner.
- 5.4 Submission of alternatives shall provide sufficient information to enable the Consultant to determine acceptability of such materials/equipment.
- 5.5 Provide complete information on required revisions to other work to accommodate each substitution, dollar amount of additions to or reductions from Bid Price, including revisions to other work. A later claim by Bidder for an addition to contract price because of changes in work necessitated by use of substitutions shall not be considered.

**Ib.06 Co-Ordination of Sub-Trades and Suppliers**

- 6.1 It shall be the responsibility of the Contractor to co-ordinate all sub-trades and ensure that any orders for material or equipment required by the sub-trades have been placed with sufficient time to allow for delivery on schedule. If, for any reason, a delay in delivery is encountered, the Contractor shall have available, extra copies of correspondence showing the date of ordering, date of delivery and reason for delay, and make this information available to the Owner upon request.

**Ib.07 Site Assessment**

- 7.1 Pre-Bid Conference and Site Visit
  - A. A pre-bid conference and Site visit will be held at the Site on March 22, 2023 starting at 2 p.m. local time.
  - B. The pre-bid conference is optional.

- C. Bidders are encouraged to visit the Site and surrounding area prior to submission of tenders and make themselves acquainted with the Site conditions and all information necessary for the proper execution of the Work covered by the tender documents. During the Site visit, bidders shall satisfy themselves by personal examination, inspection, and investigation of the Site and the surroundings, and shall obtain the necessary information as to risks, contingencies, and other circumstances which may influence or affect their bids, including, without limiting the generality of the foregoing, Laws and Regulations, the nature and location of the Site, the general and local conditions, particularly those bearing upon the availability and nature of on-Site native granular material, transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, uncertainties of weather, physical conditions at the Site, the location and condition of facilities and structures (including utilities and the like), whether above or below the ground, the conformation and conditions of the ground, the character of equipment and facilities needed prior to and during the prosecution of the Works, and all other matters which can in any way affect the progress, performance, or furnishing of the Works, or the cost thereof under the Contract. Bidders shall not claim at any time after submission of bids that there was any misunderstanding of the terms and conditions of the Contract related to the Site conditions, including, but not limited to, any of the matters described in this Ib.07/7.1 C
- D. No extra payment will be made to the Contractor, above the Contract Price, for costs resultant from failure to determine the conditions that affect the work.

7.2 Additional Site Visits

- A. Bidders may request additional site visits by sending an inquiry per IB.04.5.

**Ib.08 Qualifications**

8.1 Subcontractors and Suppliers

- A. The list of subcontractors and suppliers named by the bidder shall be the approved slate of subcontractors and suppliers. Any changes following the acceptance of tender shall only be accepted with the written approval of the Owner and only as a result of extraordinary circumstances.
- B. The Owner reserves the right to reject a proposed subcontractor for reasonable cause at their discretion.

**Ib.09 Bid Submission**

9.1 Bid Ineligibility

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, shall at discretion of Owner, be declared non-compliant.
- B. Bids with Bid Forms and enclosures which are improperly prepared shall at discretion of Owner, be declared non-compliant.
- C. Bids that fail to include insurance requirements shall at discretion of the Owner, be declared non-compliant.

- D. All blanks on the Form of Bid shall be completed by printing in ink or by typewriter and the bid signed.
- E. Discrepancies between the extension of the approximate quantity and the bid unit price will be resolved in favor of the unit price. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

9.2 Submissions

- A. Bidders shall be solely responsible for delivery of their Bids in manner and time prescribed.
- B. Submit an electronic copy of the executed offer, signed and with corporate seal clearly identified as discussed in Ib.01/1.1A.
- C. Improperly completed information shall be cause to declare Bid non-compliant.

**Ib.10 Bid Enclosures/Requirements**

10.1 Insurance

- A. Subcontractors, Suppliers, or others.
  - 1. Provide signed Certificate of Insurance Availability in accordance with the Form of Bid.

10.2 CCDC 4 and Supplementary Conditions

- A. Bidder shall provide in its cover letter confirmation of acceptance of the CCDC 4 and Supplementary Conditions provided in the Bid Documents, or provide any and all proposed revisions for OWNER's consideration.

10.3 Bid Form Requirements

- A. Bidder, in submitting an offer, accepts time period stated in Contract documents for performing work. Completion date in Agreement shall be as identified in the Contract Documents.

10.4 Bid Signing

- A. Bid form shall be signed under seal by Bidder.
- B. Sole Proprietorship: Signature of sole proprietor in presence of witness who will also sign. Insert words "Sole Proprietor" under signature. Affix seal. Official address of Bidder shall be shown below the signature.
- C. Partnership: Signature of all partners in presence of witness who will also sign. Insert word Partner under each signature. Affix seal to each signature. The official address of the partnership shall be shown below the signatures.



- D. Limited Company: Signature of duly authorized signing officer(s) in normal signatures. Insert officer's capacity in which signing officer acts, under each signature. Affix corporate seal. If Bid is signed by officials other than President and Secretary of company, or President-Secretary-Treasurer of company, copy of by-law resolution of Board of Directors authorizing them to do so must also be submitted with Bid. The province of formation of the firm and the official address of the firm shall be shown below the signature.
- E. Corporation: If the bid is submitted by a corporation, the bid shall be signed (under seal if required to make the bid a valid and binding obligation of the corporation) in its corporate name and on its behalf by the president or a vice-president (or other duly authorized corporate officer) accompanied by evidence of authority to sign. Such evidence shall be in the form of a valid resolution passed by the bidder's Board of Directors identifying the officer(s) signing the bid and authorizing the officer(s) to do so on behalf of the bidder. The corporate address and province of incorporation shall be shown below the signature.
- F. Joint Venture: If the bid is submitted by two or more contractors as partners in a joint venture, an authorized representative of each partner of the joint venture shall sign the bid, and by signing undertakes that if the bid is accepted each partner of the joint venture will be jointly and severally bound to discharge the duties, obligations, and responsibilities of the Contract. Additionally, the bid shall include a copy of the resolution or agreement empowering each representative to sign the bid and bind the firm to the joint venture. The official address of the joint venture shall be shown below the signature.

## **Ib.11 Security**

### 11.1 Bid Bond

- A. Bidders shall furnish with their bid a Bid Bond on the form prescribed in the bid documents executed by the bidder as Principal and having as surety thereon a surety company lawfully doing business in the Province of British Columbia. Such Bid Bond shall be issued by a surety company meeting the requirements of GC 11.2 of the Supplementary Conditions and shall be in an amount not less than 10 percent of the total maximum amount of the bid price listed in the Form of Bid. The Bid Bond shall name City of Terrace as Obligee.
- B. A certified cheque, payable to City of Terrace in the amount required for the Bid Bond, may be substituted for the Bid Bond.
- C. The bid security of the successful bidder will be retained by Owner until such bidder has satisfied the requirements of Ib.13, whereupon the bid security will be returned. The bid security of the other bidders will be returned, upon request, at the end of the specified bid validity period or when the required Contract bonds are received from the successful bidder, whichever occurs first.
- D. If any bidder shall withdraw or attempt to withdraw its bid at any time within the specified bid validity period, the bidder's bid security shall be forfeited and such bid security shall become the property of Owner.

11.2 Agreement to Bond

- A. In addition to the specified Bid Bond, bidders shall furnish with their bid an Agreement to Bond on the form prescribed in the bid documents, which form shall be completed by a surety company lawfully doing business in the Province of British Columbia and meeting the requirements of GC 11.2 of the Supplementary Conditions.

11.3 Contract Bonds

- A. Pursuant to GC 11.2 of the Supplementary Conditions, the successful bidder shall, within 7 days after the date of the Notice of Award, furnish the following Contract bonds on the forms prescribed in the bid documents and from a surety company acceptable to Owner:
  - 1. A Performance Bond in the amount of 50 percent of the amount of the Contract Price.
  - 2. A Payment Bond in the amount of 50 percent of the amount of the Contract Price.

**Ib.12 Offer Acceptance/ Rejection**

12.1 Duration of Offer

- A. Bids shall remain open to acceptance, and irrevocable for a period of 90 days after the Bid closing date.

12.2 Withdrawal of Offer

- A. Any bidder may withdraw its bid before the time and date of bid closing by providing written notice thereof to the address specified for submission of bids in Ib.01. Such withdrawal by the bidder will not prejudice the right of the bidder to resubmit a bid, provided that it is delivered to the place where bids are to be submitted at any time prior to the time and date of bid closing. However, after the time and date of bid closing has expired, no bid may be withdrawn within the specified bid validity period.

12.3 Acceptance of Offer

- A. Owner reserves right to accept or reject any or all offers, including, without limitation, the lowest Tender, and to award the Contract to whomever the Owner, in its sole and absolute discretion, deems appropriate notwithstanding any custom of the trade nor anything contained in the Contract Documents herein. The Owner shall not, under any circumstances, be responsible for any costs incurred by the Tenderer in preparing of its Tender.

Without limiting the generality of the foregoing, the Owner reserves the right, in its sole and absolute discretion, to accept or reject any Tender which in the view of the Owner is incomplete, obscure, or irregular, which has erasures or corrections in the documents, which contains exceptions and variations, which omits one or more prices, which contains prices the Owner consider unbalanced.

Criteria which may be used by the Owner in evaluating tenders and awarding the Contract are in the Owner's sole and absolute discretion and, without limiting the generality of the foregoing, may include one or more of:

1. Price
2. Total cost to Owner
3. Reputation, including references provided in the form of bid
4. Claims history of Tenderer
5. Qualifications and experience of the Tenderer and its listed personnel
6. Quality of services proposed by the Tenderer
7. Ability of the Tenderer to ensure continuous availability of qualified and experienced personnel
8. The proposed Labour and Equipment
9. The proposed Supervisory Staff
10. The Construction Schedule and Plan.

Should the Owner not receive any tender satisfactory to the Owner in its sole and absolute discretion, the Owner reserves the right to re-tender the Contract, or negotiate a contract for the whole or any part of the Contract with anyone or more persons whatsoever, including one or more of the Tenderers.

- B. After acceptance by the Owner, the Owner will issue to the successful Bidder a written Bid acceptance letter. Unsuccessful Bidders may not be contacted by the Owner. Contract documents shall be signed by the Contractor within five (5) days of the written notification of acceptance of their tender.

### **Ib.13 Notice of Award**

#### 13.1 Signing Contract and Delivery of Documentation

- A. Acceptance of a bid will be evidenced by a written Notice of Award issued by Consultant on behalf of Owner, delivered in person or by courier service to the bidder whose bid is accepted. No other act of Owner shall constitute acceptance of a bid.
- B. The Notice of Award shall obligate the bidder whose bid is accepted to sign and deliver three copies of the Contract Documents and to furnish and deliver the required Contract insurance documentation within 7 days after the date of the Notice of Award. After signing by Owner, one fully signed copy shall be returned to Contractor.
- C. If the Contract Documents prepared for signature by the successful bidder do not accompany the Notice of Award but are sent the next day or later, the successful bidder's obligation to deliver signed Contract Documents and to furnish and deliver Contract insurance documentation within 7 days after the date of the Notice of Award shall be extended for a time equal to the delay in sending the Contract Documents to the successful bidder.

#### 12.2 Failure to Sign Contract

- A. If the bidder whose bid is accepted refuses or fails to sign and deliver the Contract Documents and furnish and deliver the required Contract insurance documentation within 7 days after the date of the Notice of Award, it will be

considered that the bidder has abandoned all rights and interests in the award in which case Owner may annul the Notice of Award and the bid security of that bidder, if any, will be forfeited and shall become the property of Owner.

**Ib.14 Notice to Proceed**

14.1 Commencement of Contract Times

- A. Upon signing of the Contract by Owner or at any time on or after the effective date of the Contract (date of the Notice of Award), Consultant on behalf of Owner will issue to Contractor a written Notice to Proceed.

**Ib.15 Post-Bid Submissions**

15.1 The Contractor shall provide within 48 hours after receiving award of Contract a copy of the following documents:

- A. The Contractor shall provide evidence of compliance with the requirements of the Province of British Columbia with respect to Workers' Compensation Insurance including payments due thereunder. This shall be in the form of a current and valid WorkSafeBC Clearance Letter. It will be the responsibility of the Principal Contractor to ensure coverage is in place for their employees and employees of their sub-contractors.
- B. At any time during the term of the Contract, when requested by the Owner, the Contractor shall provide such evidence of compliance for the above requirements.

15.2 Failure by the successful Bidder to meet the above requirements will entitle the Owner to cancel the award of the Contract.

END OF INSTRUCTIONS TO BIDDERS

# CCDC 4

CCDC 4

# Unit Price Contract

# 2 0 1 1

Phase 2 MSW Area Closure  
Terrace Landfill, Terrace, BC  
City of Terrace

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

CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE  
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## TABLE OF CONTENTS

### AGREEMENT BETWEEN OWNER AND CONTRACTOR

- A-1 The Work
- A-2 Agreements and Amendments
- A-3 Contract Documents
- A-4 Contract Price
- A-5 Payment
- A-6 Receipt of and Addresses for Notices in Writing
- A-7 Language of the Contract
- A-8 Succession

### DEFINITIONS

- Change Directive
- Change Order
- Construction Equipment
- Consultant
- Contract
- Contract Documents
- Contract Price
- Contract Time
- Contractor
- Drawings
- Notice in Writing
- Owner
- Place of the Work
- Product
- Project
- Provide
- Schedule of Prices
- Shop Drawings
- Specifications
- Subcontractor
- Substantial Performance of the Work
- Supplemental Instruction
- Supplier
- Temporary Work
- Unit Price
- Value Added Taxes
- Work
- Working Day

### GENERAL CONDITIONS OF THE UNIT PRICE CONTRACT

#### PART 1 GENERAL PROVISIONS

- GC 1.1 Contract Documents
- GC 1.2 Law of the Contract
- GC 1.3 Rights and Remedies
- GC 1.4 Assignment

#### PART 2 ADMINISTRATION OF THE CONTRACT

- GC 2.1 Authority of the Consultant
- GC 2.2 Role of the Consultant
- GC 2.3 Review and Inspection of the Work
- GC 2.4 Defective Work

#### PART 3 EXECUTION OF THE WORK

- GC 3.1 Control of the Work
- GC 3.2 Construction by Owner or Other Contractors
- GC 3.3 Temporary Work
- GC 3.4 Document Review
- GC 3.5 Construction Schedule
- GC 3.6 Supervision
- GC 3.7 Subcontractors and Suppliers
- GC 3.8 Labour and Products
- GC 3.9 Documents at the Site
- GC 3.10 Shop Drawings
- GC 3.11 Use of the Work
- GC 3.12 Cutting and Remedial Work
- GC 3.13 Cleanup

#### PART 4 ALLOWANCES

- GC 4.1 Cash Allowances
- GC 4.2 Contingency Allowance

#### PART 5 PAYMENT

- GC 5.1 Financing Information Required of the Owner
- GC 5.2 Applications for Progress Payment
- GC 5.3 Progress Payment
- GC 5.4 Substantial Performance of the Work
- GC 5.5 Payment of Holdback upon Substantial Performance of the Work
- GC 5.6 Progressive Release of Holdback
- GC 5.7 Final Payment
- GC 5.8 Withholding of Payment
- GC 5.9 Non-conforming Work

#### PART 6 CHANGES IN THE WORK

- GC 6.1 Owner's Right to Make Changes
- GC 6.2 Change Order
- GC 6.3 Change Directive
- GC 6.4 Concealed or Unknown Conditions
- GC 6.5 Delays
- GC 6.6 Claims for a Change in Contract Price
- GC 6.6 Quantity Variations

#### PART 7 DEFAULT NOTICE

- GC 7.1 Owner's Right to Perform the Work, Terminate the Contractor's Right to Continue with the Work or Terminate the Contract
- GC 7.2 Contractor's Right to Suspend the Work or Terminate the Contract

#### PART 8 DISPUTE RESOLUTION

- GC 8.1 Authority of the Consultant
- GC 8.2 Negotiation, Mediation and Arbitration
- GC 8.3 Retention of Rights

#### PART 9 PROTECTION OF PERSONS AND PROPERTY

- GC 9.1 Protection of Work and Property
- GC 9.2 Toxic and Hazardous Substances
- GC 9.3 Artifacts and Fossils
- GC 9.4 Construction Safety
- GC 9.5 Mould

#### PART 10 GOVERNING REGULATIONS

- GC 10.1 Taxes and Duties
- GC 10.2 Laws, Notices, Permits, and Fees
- GC 10.3 Patent Fees
- GC 10.4 Workers' Compensation

#### PART 11 INSURANCE AND CONTRACT SECURITY

- GC 11.1 Insurance
- GC 11.2 Contract Security

#### PART 12 INDEMNIFICATION, WAIVER OF CLAIMS AND WARRANTY

- GC 12.1 Indemnification
- GC 12.2 Waiver of Claims
- GC 12.3 Warranty

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

**AGREEMENT BETWEEN OWNER AND CONTRACTOR**

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

**This Agreement** made on the \_\_\_\_\_ day of \_\_\_\_\_ in the year 2023 .

**by and between the parties**

City of Terrace  
Attn: Ann Maher

hereinafter called the *Owner*

**and**

hereinafter called the *Contractor*

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

**ARTICLE A-1 THE WORK**

The *Contractor* shall:

- 1.1 perform the *Work* required by the *Contract Documents* for  
Phase 2 MSW Area Closure

located at

*insert above the name of the Work*

7 km north of Terrace, BC entrance located at 54.55652156104091, -128.64893393991062

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

*insert above the Place of the Work*

GHD Limited  
Attn: David Engstrom

*insert above the name of the Consultant*

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

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

- 1.3 commence the *Work* by the \_\_\_\_\_ day of \_\_\_\_\_ in the year 2023 and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Substantial Performance of the Work*, by the \_\_\_\_\_ day of \_\_\_\_\_ in the year 2023 .



## ARTICLE A-2 AGREEMENTS AND AMENDMENTS

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

**ARTICLE A-3 CONTRACT DOCUMENTS**

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

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

- Supplementary Conditions
- Project Specifications
- 01 10 00 Summary
- 01 20 00 Price and payment procedures
- 01 30 00 Administrative requirements
- 01 33 00 Submittal procedures
- 01 35 29.14 Health and safety for contaminated sites
- 01 40 00 Quality requirements
- 01 50 00 Temporary facilities and controls.doc
- 01 60 00 Product requirements
- 01 70 00 Execution and closeout requirements
- 02 56 13.16 Geosynthetic clay liner
- 02 66 13 Landfill gas vents
- 31 05 19.13 Geotextiles for earthwork
- 31 10 00 Site removals
- 31 23 16 Excavation
- 31 23 23 Fill
- 32 92 19 Topsoil and seeding
- 33 05 13 Manholes and structures
- 33 42 13 Pipe culverts
- Addenda
- Contract Drawings
- Contractor's Form of Bid

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

**ARTICLE A-4 CONTRACT PRICE**

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

<b>Schedule of Prices</b>					
Item No.	Description of Work	* Unit of Measure	* Estimated Quantity (EQ)	Unit Price (UP)	Amount (EQ x UP)
Page Subtotal Carried Forward from Page					\$
	Refer to Schedule of Prices in Form of Bid			\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
				\$	\$ 0.00
Page Sub-total					\$

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

Page of

### Schedule of Prices

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

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

Page      of

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

/100 dollars \$

4.3 *Value Added Taxes* (of 5 %) payable by the *Owner* to the *Contractor*, based on the estimated *Contract Price*, are:

/100 dollars \$

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

/100 dollars \$

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

4.6 All amounts are in Canadian funds.

## ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents*, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a holdback of ten percent ( 10 %), the *Owner* shall:

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

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

5.3 Interest

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

- (1) 2% per annum above the prime rate for the first 60 days.
- (2) 4% per annum above the prime rate after the first 60 days.

Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by

**Royal Bank of Canada**

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

for prime business loans as it may change from time to time.

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

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

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

### Owner

City of Terrace  
Attn: Ann Maher

*name of Owner\**

3215 Eby St, Terrace, BC V8G 2X8

*address*

amaher@terrace.ca

*Facsimile number*

*e-mail address*

### Contractor

*name of Contractor\**

*address*

*Facsimile number*

*e-mail address*

### Consultant

GHD Limited  
Attn: David Engstrom

*name of Consultant\**

138 East 7th Avenue, Suite 100, Vancouver, British Columbia V5T 1M6

*address*

david.engstrom@ghd.com

*Facsimile number*

*e-mail address*

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

## ARTICLE A-7 LANGUAGE OF THE CONTRACT

- 7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English/~~French~~\* language shall prevail.  
\* *Complete this statement by striking out inapplicable term.*
- 7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

**ARTICLE A-8 SUCCESSION**

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

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

SIGNED AND DELIVERED

in the presence of:

**WITNESS**

**OWNER**

City of Terrace  
Attn: Ann Maher

*name of owner*

*signature*

*signature*

*name of person signing*

*name and title of person signing*

*signature*

*signature*

*name of person signing*

*name and title of person signing*

**WITNESS**

**CONTRACTOR**

*name of Contractor*

*signature*

*signature*

*name of person signing*

*name and title of person signing*

*signature*

*signature*

*name of person signing*

*name and title of person signing*

*N.B. Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:*  
*(a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or*  
*(b) the affixing of a corporate seal, this Agreement should be properly sealed.*



## DEFINITIONS

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

### **Change Directive**

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

### **Change Order**

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

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

### **Construction Equipment**

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

### **Consultant**

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

### **Contract**

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

### **Contract Documents**

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

### **Contract Price**

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

### **Contract Time**

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

### **Contractor**

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

### **Drawings**

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

### **Notice in Writing**

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

### **Owner**

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

### **Place of the Work**

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

### **Product**

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

**Project**

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

**Provide**

*Provide* means to supply and install.

**Schedule of Prices**

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

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

**Shop Drawings**

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

**Specifications**

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

**Subcontractor**

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

**Substantial Performance of the Work**

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

**Supplemental Instruction**

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

**Supplier**

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

**Temporary Work**

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

**Unit Price**

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

**Value Added Taxes**

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

**Work**

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

**Working Day**

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

## GENERAL CONDITIONS OF THE UNIT PRICE CONTRACT

### PART 1 GENERAL PROVISIONS

#### GC 1.1 CONTRACT DOCUMENTS

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

#### GC 1.2 LAW OF THE CONTRACT

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

#### GC 1.3 RIGHTS AND REMEDIES

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

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

#### **GC 1.4 ASSIGNMENT**

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

### **PART 2 ADMINISTRATION OF THE CONTRACT**

#### **GC 2.1 AUTHORITY OF THE CONSULTANT**

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

#### **GC 2.2 ROLE OF THE CONSULTANT**

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

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

### **GC 2.3 REVIEW AND INSPECTION OF THE WORK**

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

### **GC 2.4 DEFECTIVE WORK**

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

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

## **PART 3 EXECUTION OF THE WORK**

### **GC 3.1 CONTROL OF THE WORK**

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

### **GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

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

### **GC 3.3 TEMPORARY WORK**

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

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

#### **GC 3.4 DOCUMENT REVIEW**

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

#### **GC 3.5 CONSTRUCTION SCHEDULE**

3.5.1 The *Contractor* shall:

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

#### **GC 3.6 SUPERVISION**

3.6.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representative shall not be changed except for valid reason.

3.6.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor's* appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

#### **GC 3.7 SUBCONTRACTORS AND SUPPLIERS**

3.7.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:

- .1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;
- .2 incorporate the terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and
- .3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.

3.7.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.

3.7.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.

3.7.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the differences occasioned by such required change.

3.7.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.

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

### **GC 3.8 LABOUR AND PRODUCTS**

3.8.1 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.

3.8.2 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.

3.8.3 The *Contractor* shall maintain good order and discipline among the *Contractor's* employees engaged on the *Work* and shall not employ on the *Work* anyone not skilled in the tasks assigned.

### **GC 3.9 DOCUMENTS AT THE SITE**

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

### **GC 3.10 SHOP DRAWINGS**

3.10.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.

3.10.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of other contractors.

3.10.3 Upon request of the *Contractor* or the *Consultant*, they shall jointly prepare a schedule of the dates for provision, review and return of *Shop Drawings*.

3.10.4 The *Contractor* shall provide *Shop Drawings* in the form specified, or if not specified, as directed by the *Consultant*.

3.10.5 *Shop Drawings* provided by the *Contractor* to the *Consultant* shall indicate by stamp, date and signature of the person responsible for the review that the *Contractor* has reviewed each one of them.

3.10.6 The *Consultant's* review is for conformity to the design concept and for general arrangement only.

3.10.7 *Shop Drawings* which require approval of any legally constituted authority having jurisdiction shall be provided to such authority by the *Contractor* for approval.

3.10.8 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:

- .1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and
- .2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.

3.10.9 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.

3.10.10 The *Consultant's* review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.

3.10.11 The *Contractor* shall provide revised *Shop Drawings* to correct those which the *Consultant* rejects as inconsistent with the *Contract Documents*, unless otherwise directed by the *Consultant*. The *Contractor* shall notify the *Consultant* in writing of any revisions to the *Shop Drawings* other than those requested by the *Consultant*.

3.10.12 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

### **GC 3.11 USE OF THE WORK**

3.11.1 The *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of employees and *Subcontractors* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.

3.11.2 The *Contractor* shall not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety of the *Work*.



### **GC 3.12 CUTTING AND REMEDIAL WORK**

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

### **GC 3.13 CLEANUP**

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

## **PART 4 ALLOWANCES**

### **GC 4.1 CASH ALLOWANCES**

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

### **GC 4.2 CONTINGENCY ALLOWANCE**

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

## PART 5 PAYMENT

### GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

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

### GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

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

### GC 5.3 PROGRESS PAYMENT

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

#### **GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK**

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

#### **GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK**

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

#### **GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK**

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

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

#### **GC 5.7 FINAL PAYMENT**

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

#### **GC 5.8 WITHHOLDING OF PAYMENT**

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

#### **GC 5.9 NON-CONFORMING WORK**

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

### **PART 6 CHANGES IN THE WORK**

#### **GC 6.1 OWNER'S RIGHT TO MAKE CHANGES**

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

#### **GC 6.2 CHANGE ORDER**

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

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

### GC 6.3 CHANGE DIRECTIVE

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

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

#### **GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

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

## **GC 6.5 DELAYS**

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

## **GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE**

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

## **GC 6.7 QUANTITY VARIATIONS**

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

## **PART 7 DEFAULT NOTICE**

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

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



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

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

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

## **PART 8 DISPUTE RESOLUTION**

### **GC 8.1 AUTHORITY OF THE CONSULTANT**

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

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

## **GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION**

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

## **GC 8.3 RETENTION OF RIGHTS**

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

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

## **PART 9 PROTECTION OF PERSONS AND PROPERTY**

### **GC 9.1 PROTECTION OF WORK AND PROPERTY**

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

### **GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

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

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

### **GC 9.3 ARTIFACTS AND FOSSILS**

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

### **GC 9.4 CONSTRUCTION SAFETY**

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

### **GC 9.5 MOULD**

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

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

## **PART 10 GOVERNING REGULATIONS**

### **GC 10.1 TAXES AND DUTIES**

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

### **GC 10.2 LAWS, NOTICES, PERMITS, AND FEES**

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

### GC 10.3 PATENT FEES

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

### GC 10.4 WORKERS' COMPENSATION

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

## PART 11 INSURANCE AND CONTRACT SECURITY

### GC 11.1 INSURANCE

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

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

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

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

## **GC 11.2 CONTRACT SECURITY**

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

## **PART 12 INDEMNIFICATION, WAIVER OF CLAIMS AND WARRANTY**

### **GC 12.1 INDEMNIFICATION**

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

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

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

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

## GC 12.2 WAIVER OF CLAIMS

- 12.2.1 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* arising from the *Contractor's* involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:
  - .1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;
  - .2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;
  - .3 claims for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 12.1.4 or 12.1.5 of GC 12.1 – INDEMNIFICATION; and
  - .4 claims resulting from acts or omissions which occur after the date of *Substantial Performance of the Work*.
- 12.2.2 The *Contractor* waives and releases the *Owner* from all claims referenced in paragraph 12.2.1.4 except for those referred in paragraphs 12.2.1.2 and 12.2.1.3 of GC 12.1 – INDEMNIFICATION and claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the date of *Substantial Performance of the Work*.



- 12.2.3 Subject to any lien legislation applicable to the *Place of the Work*, as of the fifth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* arising from the *Owner's* involvement in the *Work*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the date of *Substantial Performance of the Work*, except as follows:
- .1 claims arising prior to or on the date of *Substantial Performance of the Work* for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than the sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*;
  - .2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;
  - .3 claims for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 12.1.4 of GC 12.1 - INDEMNIFICATION;
  - .4 damages arising from the *Contractor's* actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;
  - .5 claims arising pursuant to GC 12.3 - WARRANTY; and
  - .6 claims arising from acts or omissions which occur after the date of *Substantial Performance of the Work*.
- 12.2.4 The *Owner* waives and releases the *Contractor* from all claims referred to in paragraph 12.2.3.4 except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the date of *Substantial Performance of the Work* should any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, within such shorter period as may be prescribed by:
- .1 any limitation statute of the Province or Territory of the *Place of the Work*; or
  - .2 if the *Place of the Work* is the Province of Quebec, then Article 2118 of the Civil Code of Quebec.
- 12.2.5 The *Owner* waives and releases the *Contractor* from all claims referenced in paragraph 12.2.3.6 except for those referred in paragraph 12.2.3.2, 12.2.3.3 and those arising under GC 12.3 – WARRANTY and claims for which *Notice in Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the date of *Substantial Performance of the Work*.
- 12.2.6 "Notice in Writing of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 12.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:
- .1 a clear and unequivocal statement of the intention to claim;
  - .2 a statement as to the nature of the claim and the grounds upon which the claim is based; and
  - .3 a statement of the estimated quantum of the claim.
- 12.2.7 The party giving "Notice in Writing of claim" as provided for in GC 12.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.
- 12.2.8 Where the event or series of events giving rise to a claim made under paragraphs 12.2.1 or 12.2.3 has a continuing effect, the detailed account submitted under paragraph 12.2.7 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.
- 12.2.9 If a *Notice in Writing* of claim pursuant to paragraph 12.2.1.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph 12.2.3.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*. If a *Notice in Writing* of claim pursuant to paragraph 12.2.3.1 is received on the seventh or sixth calendar day before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*, the period within which *Notice in Writing* of claim shall be received pursuant to paragraph 12.2.1.1 shall be extended to two calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work*.

## GC 12.3 WARRANTY

- 12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date of *Substantial Performance of the Work*.
- 12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

- 12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.
- 12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor's* expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.
- 12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.
- 12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor's* responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

# CCDC 41

**CCDC 41**  
**CCDC INSURANCE REQUIREMENTS**

**PUBLICATION DATE: JANUARY 21, 2008**

1. General liability insurance shall be with limits of not less than \$5,000,000 per occurrence, an aggregate limit of not less than \$5,000,000 within any policy year with respect to completed operations, and a deductible not exceeding \$5,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.
2. Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than \$5,000,000 inclusive per occurrence for bodily injury, death and damage to property, covering all vehicles owned or leased by the *Contractor*. Where the policy has been issued pursuant to a government-operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor*.
3. Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft (if used directly or indirectly in the performance of the *Work*), including use of additional premises, shall have limits of not less than \$5,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof and limits of not less than \$5,000,000 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the *Owner*.
4. "Broad form" property insurance shall have limits of not less than the sum of 1.1 times *Contract Price* and the full value, as stated in the *Contract*, of *Products* and design services that are specified to be provided by the *Owner* for incorporation into the *Work*, with a deductible not exceeding \$5,000. The insurance coverage shall not be less than the insurance provided by IBC Forms 4042 and 4047 (excluding flood and earthquake) or their equivalent replacement. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.
5. Boiler and machinery insurance shall have limits of not less than the replacement value of the permanent or temporary boilers and pressure vessels, and other insurable objects forming part of the *Work*. The insurance coverage shall not be less than the insurance provided by a comprehensive boiler and machinery policy.
6. "Broad form" contractors' equipment insurance coverage covering *Construction Equipment* used by the *Contractor* for the performance of the *Work*, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner*. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance, the *Owner* may agree to waive the equipment insurance requirement.
7. Standard Exclusions
  - 7.1 In addition to the broad form property exclusions identified in IBC forms 4042(1995), and 4047(2000), the *Contractor* is not required to provide the following insurance coverage:
    - Asbestos
    - Cyber Risk
    - Mould
    - Terrorism

# Supplementary Conditions

**CCDC 4 SUPPLEMENTARY CONDITIONS  
PHASE 2 MSW AREA CLOSURE  
TERRACE LANDFILL  
TERRACE, BRITISH COLUMBIA  
CITY OF TERRACE**

**DEFINITIONS**

Wherever used in the Contract Documents, the defined terms shall have the meanings indicated which are applicable to both the singular and plural thereof.

Insert the following new definitions, which shall apply to the Contract Documents other than the CCDC 4 document (i.e., including the specifications, form of bid, and drawings):

1. "day", unless otherwise noted shall be synonymous with calendar day.
2. Defect shall mean any aspect of the Works that is unsatisfactory, faulty or deficient, or does not conform to the requirements of the Contract, and defective shall have a like meaning.
3. directed, designated, permitted, required, accepted, and words of like import, wherever and in whatever manner used, with or without reference to the ENGINEER, mean as directed, designated, permitted, required, and accepted by the ENGINEER.
4. ENGINEER shall be synonymous with *Consultant* as defined in CCDC 4.
5. furnish, when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
6. Laws and Regulations shall be synonymous with "laws, ordinances, rules, regulations or codes" as used in CCDC 4.
7. Notice of Award means a written notice by the OWNER to the successful tenderer stating that upon compliance by the successful tenderer with the conditions precedent enumerated therein, within the time specified, the OWNER will sign and deliver the Agreement.
8. Notice to Proceed means a written notice given by the ENGINEER on behalf of the OWNER to the CONTRACTOR fixing the date on which the Contract Times will commence to run.
9. Site shall be synonymous with *Place of the Work* as defined in CCDC 4.
10. shall or will whenever used to stipulate anything, means the imperative: The item must be done or performed by the party so charged and the party has entered into a covenant with the other party to do or perform the same.
11. shown, indicated, detailed, and words of like import, wherever and in whatever manner used, with or without reference to the Drawings, means shown, indicated, or detailed on the Drawings.
12. specified, described, or noted, wherever and in whatever manner used, means as specified, described, or noted in the Contract Documents.
13. submitted, wherever and in whatever manner used, means submitted to the ENGINEER or OWNER for acceptance by the ENGINEER or OWNER.
14. Works shall be synonymous with *Work* as defined in CCDC 4.

## SUPPLEMENTARY CONDITIONS

### MODIFICATIONS TO GENERAL CONDITIONS CCDC 4

These Supplementary Conditions consist of amendments and supplements to the Agreement, the Definitions and General Conditions of the Contract of the Canadian Standard Construction Document CCDC 4 – 2011 – Unit Price Contract and shall be read in conjunction with this document.

### **DEFINITIONS**

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*Replace Definitions 19, 20, 22, 24, and 26 with the following:*

**19. Subcontractor**

Subcontractor has the meaning attributed to the term “subcontractor” in the Builders Lien Act.

**20. Substantial Performance of the Work**

Substantial Performance of the Work has the meaning attributed to the term “completed” in the Builders Lien Act.

**22. Supplier**

Supplier has the meaning attributed to the term “material supplier” in the Builders Lien Act.

**24. Value Added Tax**

Value Added Taxes means such sum as shall be levied upon the Contract Price by the Federal or any Provincial or Territorial Government and is computed as a percentage of the Contract Price and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which have been imposed on the Contractor by the tax legislation, including any applicable PST, whether or not PST is, at law, a value added tax

**26. Working Day**

Working Day means a day other than Saturday, Sunday or a statutory holiday in British Columbia.

*Add the following:*

**27. Builders Lien Act**

Builders Lien Act means the British Columbia Builders Lien Act, S.B.C. 1997, c.45, as amended, as in effect on the date of this Contract.

**28. Change**

Change means a Change Order or Change Directive.

### **GENERAL CONDITIONS**

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## **GC 1.1 CONTRACT DOCUMENTS**

*Replace GC 1.1.7.1 with the following:*

1.1.7.1 the order of priority of documents, from highest to lowest shall be:

- (a) Addenda and Appendices, if any;
- (b) Supplementary Conditions;
- (c) Agreement between Owner and the Contractor;
- (d) Definitions;
- (e) General Conditions;
- (f) Specifications;
- (g) Schedules;
- (h) Drawings; and
- (i) The Contractor's Form of Bid;

*Add the following:*

1.1.11 For brevity, the language of the specifications is, in many instances, written in the imperative mood. Provisions that contain instructions or directions in the imperative mood are directed to the Contractor and, in case of conflict, such provisions are deemed to include the expression "the Contractor must".

1.1.12 If any article, section or subsection of this Contract or any portion thereof is determined to be indefinite, invalid, illegal or otherwise void, voidable or unenforceable, then it shall automatically be severed from this Contract and the balance of this Contract shall continue in full force and effect.

## **GC 1.4 ASSIGNMENT**

*Replace GC 1.4.1 with the following:*

1.4.1 The Contractor shall not assign the Contract without the Owner's written consent, which consent may be unreasonably withheld. The Contractor, when requesting the Owner's consent to an assignment, shall provide evidence satisfactory to the Owner of the ability of the proposed assignee to complete the Contract in respect of its technical and financial competence, its workforce and its equipment along with any other information requested by the Owner.

**Insert the following new GC 1.5:**

## **GC 1.5 INSPECTION OF SITE**

1.5.1 The *Contractor* shall be deemed to have inspected and examined the Site and surroundings before submitting its bid (collectively the "Inspection") and to have obtained the necessary information as to all risks, contingencies, and other circumstances which may influence or affect its bid and entering into the Contract, including (without limiting the generality of the foregoing) the nature and location of the *Work*, the general, local, and Site conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, uncertainties of weather or physical conditions at the Site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the *Work*, and all other matters which can in any way affect the progress, performance, or furnishing of the *Work*, or the cost thereof under the Contract (collectively the "Necessary Information"). Notwithstanding any other provision of the *Contract*, including GC 6.4, the *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for



conditions which could reasonably be ascertained by the *Contractor* through one or more of the Inspection of collecting the Necessary Information.

- 1.5.2 Any subsurface information and data furnished by or on behalf of *Owner* does not form part of the Contract and is not intended as a representation or warranty but is furnished in order that *Contractor* may have access to the same information which is available to *Owner*. Neither *Owner* nor *Consultant* will be responsible for any deduction, interpretation, or conclusion drawn from any information and data furnished or available to *Contractor*.

### **Insert the following new GC 1.6**

#### **GC 1.6 CONFIDENTIALITY**

*Add the following:*

- 1.6.1 The Contractor acknowledges, confirms and agrees that all unpublished business and technical information, papers and records of the Project, whether produced by the Contractor or otherwise, computer programs, drawings and specifications, tender calls and other information prepared for or in relation to the Project are and shall remain confidential, unless such unpublished business and technical information, papers and records of the Project, computer programs, drawings and specifications, tender calls and other information:

- .1 have become a part of the public domain through the actions of the Owner (through no act or failure to act on the part of the Contractor);
- .2 have been disclosed to the Contractor by a third party without a covenant of confidentiality and constitute information or procedures which are widely known, the disclosure of which would not otherwise constitute a breach hereof;
- .3 are required by law to be disclosed;
- .4 are required to be disclosed in an arbitration hearing or litigation matter; or
- .5 have been released from the provisions of this paragraph 1.5.1 by the written authorization of the Owner.

The Contractor covenants and agrees that its employees and other persons employed or retained by the Contractor shall be bound by such confidentiality and that it shall be liable to the Owner for any breach by them. For a period ending five (5) years after the date of Substantial Performance of the Work, the Contractor shall take all reasonable precautions to ensure compliance with this clause by any such persons and directors, officers and employees.

- 1.6.2 The Contractor hereby agrees not to use any logos or names used by the Owner, or materials which depict or refer to the Work or the Project in connection with any of the Contractor's business promotion activities without the prior written consent of the Owner. The Contractor acknowledges that the Owner has complete control over the use of its logos or names, and that it is within the sole discretion of the Owner how such logos or names may be used.
- 1.6.3 The Contractor shall be entitled to sign the Work, provided that all signage to be erected by the Contractor at the Place of the Work must be approved in writing by the Owner, acting reasonably. If the Contractor wishes to obtain approval of any proposed signage it must provide details satisfactory to the Owner as to size, format and location of the proposed signage with its request for approval.

## **GC 2.1 AUTHORITY OF THE CONSULTANT**

*Insert the following new paragraph 2.1.4:*

- 2.1.4 Neither *Consultant's* authority or responsibility under GC 2.1, 2.2, 2.3 or under any other provision of the *Contract Documents* nor any decision made by the *Consultant* in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by *Consultant* shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by *Consultant* to *Contractor*, any *Subcontractor*, any Supplier, or to any surety for or employee or agent of any of them.

## **GC 2.2 ROLE OF THE CONSULTANT**

*Delete paragraph 2.2.3 and replace with the following:*

- 2.2.3 The *Consultant* will provide at the *Place of the Work* a representative to assist in carrying out the *Consultant's* responsibilities. The representative will be stationed at the Site, in an office provided by *Contractor*. The duties, responsibilities and limitations of authority of such project representative shall be as set forth in writing to the Contractor.

*Add the following at the end of paragraph 2.2.5:*

The certificate for final payment prepared by *Consultant* and the *Consultant's* review of accompanying documentation and all maintenance and operating instructions, schedules, warranties, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by *Contractor* will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the *Contract Documents*, and will not affect the *Contractor's* obligations under the *Contract* in regards to the performing the *Work* in accordance with the *Contract Documents* .

*Add the following:*

- 2.2.19 The Consultant or the Owner, acting reasonably, may from time to time require the Contractor to remove from the Project any personnel including project managers, superintendents or Subcontractors. Such persons shall be replaced by the Contractor in a timely fashion to the satisfaction of the Consultant or the Owner, as the case may be, at no cost to the Owner.

## **GC 2.3 REVIEW AND INSPECTION OF THE WORK**

*Amend GC 2.3.2 as follows:*

- 2.3.2 Replace the words "...the Contractor shall give the Consultant reasonable notification of when the work will be ready..." with "the Contractor shall give the Consultant at least seventy-two (72) hours prior notice (or such shorter period as the Consultant agrees) of when the work will be ready..."

*Amend GC 2.3.5 as follows:*

- 2.3.5 Add the following to the end of GC 2.3.5 “Where it is necessary to correct any portion or portions of the Work, the corrected work shall, if required by the Consultant, be retested or reinspected, at the Contractor’s sole cost and expense.”

*Insert the following new paragraph:*

- 2.3.8 The *Contractor* shall not be relieved from any obligations under the *Contract Documents* or otherwise (i) by any inspections, reviews, tests, certifications, supervision, directions, controls, authority, or approvals of the *Consultant* or *Owner* whether or not provided, required, or performed pursuant hereto, or (ii) by the lack of or inadequacy of any of same.

## **GC 2.4 DEFECTIVE WORK**

*Amend GC 2.4.1 as follows:*

- 2.4.1 Insert “, Owner and/or his agent” in the first sentence following “rejected by the Consultant” and add the following to the end of GC 2.4.1: “If the Contractor fails to promptly remove from the Place of the Work and replace or re-execute any defective work, the Owner may, but shall not be required to, remove such defective work and replace or re-execute any such defective work and the Contractor shall reimburse the Owner for any such removal (including any storage of materials removed by the Owner), replacement or re-execution upon demand.

*Add the following:*

- 2.4.4 Defective Work remedied shall be covered by warranties as per GC 12.3 WARRANTY, except that the time for such warranties shall not begin until the later of the time identified in GC 12.3 or the time that the defective Work is remedied to the satisfaction of the Consultant.
- 2.4.5 Neither acceptance of the Work by the Consultant or the Owner nor any failure by the Consultant or the Owner to identify, observe or warn of defective Work or any deficiency in the Work shall relieve the Contractor from the sole responsibility for rectifying such defect or deficiency at the Contractor’s sole cost, even where such failure to identify, observe or warn is negligent.

## **GC 3.1 CONTROL OF THE WORK**

*Insert the following new paragraph:*

- 3.1.3 The *Consultant* may agree to special methods of carrying out the *Work* as proposed by the *Contractor*, however, the *Consultant’s* agreement with such special methods shall not relieve the *Contractor* of its responsibility for the result and shall not constitute grounds for claims by the *Contractor* for any additional payment, nor for relief of its responsibility for the methods used.

## **GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

*Add the following to the end of paragraph 3.2.2.2, before the semicolon:*

as it applies to the application of health and construction safety legislation at the *Place of the Work*, clearly define and effectively mark with temporary fencing the perimeter of the area in the *Place of the Work* in which *Contractor* and *Owner’s* own forces are working such that *Contractor* shall be designated as Prime Contractor for the *Place of the Work* in accordance with paragraph 10.4 except in the area marked by *Owner* for *Owner’s* own

forces and shall have no overlap with *Owner's* own forces including separate access and egress and separate facilities such as toilets and wash-up facilities;

*Replace GC 3.2.3.3 with the following:*

- 3.2.3.3 report to the Consultant any apparent deficiencies in such work within two (2) Working Day after the apparent deficiencies were, or ought reasonably to have been, observed by the Contractor, and in any event, prior to proceeding with that part of the Work.

#### **GC 3.4 DOCUMENT REVIEW**

*Amend GC 3.4.1 as follows:*

- 3.4.1 In the second sentence, delete “and in making such review the Contractor does not assume any responsibility to the Owner or the Consultant for the accuracy of the review.” And in the third sentence replace “did not discover” with “could not have discovered as a reasonable contractor conducting a general constructability review”.

#### **GC 3.5 CONSTRUCTION SCHEDULE**

Amend paragraph 3.5.1.1 by deleting the words “**prior to the first application for payment**” and replace with “**at least seven (7) days prior to mobilization**”.

*Amend GC 3.5.1.2 as follows:*

- 3.5.1.2 Replace the words “on a monthly basis or as stipulated by the Contract Documents” with “on a monthly basis, as stipulated by the Contract Documents, or as reasonably requested by the Owner or the Consultant.”

*Insert the following new paragraph 3.5.1.4:*

- .4 take whatever measures necessary, in accordance with this Agreement, and at no extra cost to *Owner* (other than payment of the Unit Prices) to meet or recover the construction schedule and comply with the *Contract Time*.

#### **GC 3.6 SUPERVISION**

*Add the following sentence to the end of paragraph 3.6.1:*

The appointed representative shall not be changed without consultation with and written acceptance by *Owner*, which acceptance shall not unreasonably be withheld.

*Add the following:*

- 3.6.3 The superintendence of the Project may be deemed unsatisfactory and the Owner may demand changes or additions to the superintendence if the Owner or the Consultant, acting reasonably, deems that:
- .1 the control, general safety, organization or coordination of the Work are unsatisfactory;
  - .2 the quality of the Work performed does not meet the requirements of the Contract Documents;
  - .3 the directions provided by the Consultant in accordance with the Contract Documents are not implemented; or

.4 the progress of the Work is not in accordance with the Construction Schedule.

3.6.4 In the event that the Owner makes a demand in accordance with GC 3.6.3, the Contractor must make changes or additions to the superintendence of the Project to correct the unsatisfactory conditions that gave rise to the Owner's demand at the Contractor's sole expense.

### **GC 3.7 SUBCONTRACTORS AND SUPPLIERS**

*Replace GC 3.7.2 with the following:*

3.7.2 The Contractor shall employ those Subcontractors and Suppliers proposed by the Contractor and agreed in writing, prior to the execution of this Contract, by the Owner. The Contractor acknowledges and agrees that it shall not be permitted to change any Subcontractor or Supplier without cause and the prior written consent of the Owner.

*Add the following:*

3.7.7 The Contractor shall coordinate (including in its role as Prime Contractor) the work of all trades and other contractors including those engaged by the Owner directly and determine to what extent work specified in each section of the specifications is affected by work indicated elsewhere and make all necessary allowances for their integration. All additional work resulting from failure to make such determination shall be done at no cost to the Owner.

3.7.8 The Contractor and its Subcontractors shall pay all of their respective Subcontractors, Suppliers, and workers that they employ such sums as are due to them. The Contractor shall take all necessary steps to ensure that the Subcontractors and Suppliers do likewise. All payments shall be made promptly when due.

3.7.9 The Contractor agrees that the Owner may, at any time, review its project payment records and make reasonable inquiries of the Contractor's Subcontractors and Suppliers in order to verify the status of invoices or payments claimed by the Subcontractors and Suppliers of the Contractor.

3.7.10 The Contractor shall ensure that all agreements, arrangements and contracts entered into with Subcontractors, Suppliers, consultants and any other entity regarding the performance of the Work, are assignable to the Owner, without the need to obtain consent of such Subcontractor, Supplier, consultant or other entity. The Contractor shall provide proof of such on request by the Owner.

### **GC 3.8 LABOUR AND PRODUCTS**

*Add the following sentences to the end of paragraph 3.8.2:*

Unless otherwise specified in the *Contract*, *Products* provided shall be new, free of defects, fit for their intended purpose and shall conform to all current applicable specifications of applicable associations, boards and codes including, but not limited to, the Canadian Standards Association, BC Building Code, BC Fire Code, BC Plumbing Code, ASTM, and all regulatory and governmental authorities having jurisdiction at the *Place of the Work*.

*Add the following:*

3.8.4 All Products shall be used strictly according to manufacturers' printed directions or recommendations unless specifically stated otherwise in the Contract Documents. All Products shall be stored as recommended by the manufacturer and kept dry at the recommended temperature where applicable. Any damaged Products shall be rejected

and the Contractor shall remove such material from the Place of the Work at the Contractor's sole expense.

- 3.8.5 The Contractor shall ensure that only Products specified or and authorized in writing by the Owner or the Consultant, or approved for substitution by the Consultant, are used or incorporated into the Work. Unspecified Products and rejected substitutions used or incorporated into the Work shall be removed and replaced with specified Products or approved substitutions at the Contractor's sole expense.

### **GC 3.10 SHOP DRAWINGS**

*Replace GC 3.10.1 with the following:*

- 3.10.1 The Contractor shall be responsible for providing all Shop Drawings necessary for the performance of the Work.

### **GC 3.11 USE OF THE WORK**

*Add the following:*

- 3.11.3 The Owner reserves the right to take possession of and use any completed or partially completed portion of the Work, regardless of the time of completion of the entire Work providing it does not interfere with the Contractor's work or adversely affect insurance coverage. Such taking possession or use of the partially completed portions shall not be construed as Substantial Performance of the Work or an acknowledgement of fulfilment of the Contract or any portion thereof.

### **GC 4.1 CASH ALLOWANCES**

*Add the following to the end of GC 4.1.2:*

- 4.1.2 The net cost of any cash allowance work shall be summarized with the competitive bids and all associated supporting backup documents for review by the Consultant and the Owner. The Contractor shall not proceed with any cash allowance work without prior written consent from the Owner.

*Add the following:*

- 4.1.8 The Contractor shall keep accurate records, as reasonably required by the Consultant, of costs under cash allowances and present them in support of the value of the cash allowances, where applicable.

### **GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT**

*Add the following:*

- 5.2.8 For the second and subsequent applications for payment, the *Contractor* shall submit CCDC 9A "Statutory Declaration" to state that all accounts for labour, subcontracts, *Products, Construction Equipment*, and other indebtedness which may have been incurred by the *Contractor* to the date of the last progress payment and for which the *Owner* might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback, set off, or as an identified amount in dispute.
- 5.2.9 For the second and subsequent applications for payment, the *Contractor* shall submit evidence of compliance with Workers' Compensation legislation at the place of the *Work* including payments due thereunder.

- 5.2.10 The application for payment shall constitute the *Contractor's* representation that the Work has been performed in accordance with the *Contract Documents*, has progressed to the point indicated in the application for payment, and the *Contractor's* warranty that title to all Work will pass to the *Owner* free and clear of all claims, liens, encumbrances, and security interests upon the incorporation of the Work, or upon the *Contractor's* receipt of payment, whichever occurs earlier.
- 5.2.11 The *Contractor* may make only one application for payment in any one calendar month.

### GC 5.3 PROGRESS PAYMENT

Add the following:

- 5.3.3 The Consultant shall not certify any payment until the Construction Schedule required in GC 3.5, the evidence of insurance required by GC 11.1, and the bonds called for in GC 11.2 have been received by the Owner.
- 5.3.4 Subject to the provisions of the *Builders Lien Act* of the Province of British Columbia, and the *Contract Documents*, the *Consultant* will fulfill the role of payment certifier, and prepare monthly certificates for payment based on the *Consultant's* measurements of the progress of the Work carried out and the *Contractor's* invoices received by the *Consultant*.
- 5.3.5 The issuance of a certificate for payment by the *Consultant* is a representation that to the best of the *Consultant's* knowledge, information and belief, the Work has progressed to the point indicated, and that the *Consultant* shall not thereby be deemed to represent that he had made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that he has reviewed the construction means, methods, techniques, sequences or procedures or that he had made any examination to determine how or for what purpose any contractor has used the money paid on account of the Contract Price.
- 5.3.6 Neither recommendation or certification of any application for payment of final payment by the *Consultant*, nor the issuance of any certificate, nor any payment by the *Owner* to the *Contractor* under the *Contract*, nor any use or occupancy of the Work or part thereof by the *Owner*, nor any act of acceptance by the *Owner*, nor any failure to do so, nor any correction of defective Work by the *Owner* shall constitute acceptance of the Work or products which are not in accordance with the *Contract* or a release of the *Contractor's* obligation to perform the Work in accordance with the *Contract*, and which constitute an approval or admission that the Work complies with the requirements of the *Contract* or relieve the *Contractor* from any of its obligations under the *Contract*.
- 5.3.7 The *Owner* will pay *Contractor* monthly for the value of the work acceptably complete and materials in place in accordance with *Consultant's* certificate for payment, less all stipulated forfeitures and deductions and less a Builders Lien Act holdback in the amount of 10 percent of the certified payment sum, or such other amount as may be required by the Builders Lien Act. The *Contractor* agrees not to advance more than 90% of each progress draw for its Subcontractors, excluding Suppliers and consultants.

## GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

Add the following to the end of GC 5.4.1:

- 5.4.1 The Consultant shall, in evaluating whether Substantial Performance of the Work has been achieved, determine the amount of Work that has been performed by determining the total value of the Work by adding all approved Changes to the Contract Price (the "Amended Contract Price") and then subtracting the value of the Work that is incomplete or deficient with the net amount being the "Work Performed". The percent performed shall be the ratio of the Work Performed to the Amended Contract Price multiplied by 100.

Add the following to the end of GC 5.4.2:

- 5.4.2 When the Consultant finds that Substantial Performance of the Work has been reached, the Consultant shall issue a Certificate of substantial performance of the work (a "Certificate of Completion"). If the Consultant determines that Substantial Performance of the Work has not been achieved, the Contractor shall perform the work required to achieve Substantial Performance of the Work and thereafter provide the Consultant with another application for a Certificate of Completion. This process shall be repeated until a Certificate of Completion is issued in accordance with this paragraph 5.4.2. Additional costs, if any, incurred by the Owner for processing any second or subsequent application shall be borne by the Contractor, shall be due on demand, and may be deducted and retained by the Owner from any payment then or thereafter due to the Contractor under this Contract.
- 5.4.4 All mechanical and electrical equipment and systems, required to be in operation for the occupancy permit, shall be operating on automatic controls and shall be fully operational at the date of Substantial Performance of the Work.

## GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

Add the following new paragraph to 5.5.1:

- .3 submit a statement to *Consultant* that all claims for an increase in *Contract Price* have been presented to *Consultant* in accordance with GC 6.6 and that *Contractor* releases the *Owner* from all claims except those made in writing prior to that date and having been notified to the *Owner* in writing as still in dispute pursuant to Part 8 Dispute Resolution.
- .4 submit a letter from the W.C.B. confirming the Contractor is in good standing;
- .5 submit a complete set of "As Built" drawings showing all changes to the Work;
- .6 submit a Release in the form attached as Schedule "A".

Delete 5.5.2 and replace with the following:

- 5.5.2 After the receipt of an application for payment from the *Contractor* and the statements as provided in paragraph 5.5.1, the *Consultant* will issue a certificate for payment of the holdback amount less:
- .1 a holdback for defects and deficiencies in the amount of 200 percent of a reasonable value as estimated by *Consultant* for corrections to defective or deficient Work;
- .2 a holdback to cover the value of claims or liens filed or reasonable evidence indicating probable filing of claims or liens; and



- .3 a holdback to cover the value of repairing damage to existing property, and/or damage to another contractor's work which has not been settled in the amount of 200 percent of a reasonable value as estimated by *Consultant*.

Amend GC 5.5.4 as follows:

- 5.5.4 Add the following words at the beginning of GC 5.5.4: "Provided that no claims of Builders Lien have been filed with respect to the Project,". At the end of the last sentence, after the words "the Owner", add the words "This paragraph shall not be interpreted or construed to in any way negate, reduce, diminish or abrogate any right of setoff or claim which the Owner may have pursuant to the Contract, at law or in equity to the holdback amount that relates solely to the Contractor and not to holdback that relates to its Subcontractors, (including national holdbacks related to Suppliers and Consultants) arising as a result of, or in relation to, the Work." The Owner's right to set-off is conditional on the Contractor having received reasonable notice (no later than Substantial Completion) of claims that are subject of a set-off.

Add the following new paragraphs:

- 5.5.6 The holdback amounts (if any) listed in paragraphs 5.5.2.1 through 5.5.2.3 will be released progressively on a monthly basis upon clearance of those items as listed herein.
- 5.5.7 If a claim of builder's lien is filed against the Project in respect of the Work by any Subcontractor, sub-Subcontractor, Supplier, worker or other person claiming through, by or under the Contractor or any of its Subcontractors, Sub-Subcontractors, Suppliers or workers, the Owner may, at its option, instruct the Contractor to cause the said claim of builders lien to be removed from the title to the Project within five (5) Working Days from the date of such notice by direct payment, furnishing of a bond, payment into court or otherwise.

If the claim of builders lien is not removed from the title to the Project within such time or such further time as may be subsequently agreed upon, the Owner, without prejudice to any other right or remedy it may have, may take such steps or proceedings, including payments, settlements or compromise of the claim or payment into court, as the Owner reasonably determines as necessary to procure release of the lien, and all payments and costs, including legal fees and disbursements incurred by the Owner shall be paid by the Contractor to the Owner or may be deducted from any amount then due or thereafter becoming due to the Contractor.

The Contractor shall, if requested by the Owner, defend, indemnify and save the Owner harmless from the amount of all such claims and the costs of defending any and all actions commenced against the Owner pursuant to the *Builders Lien Act* including the legal costs of the Owner.

- 5.5.8 Subject to GC 5.6, the Contractor shall not pay any holdback from its Subcontractors until all of the conditions for release set forth in this Contract and in the *Builders Lien Act* have been fulfilled including, without limitation, attainment of Substantial Performance of the Work and a Certificate of Completion (or termination or abandonment of the Contract) together with expiry of the fifty-five (55) day holdback period.

## GC 5.7 FINAL PAYMENT

Delete 5.7.1 and replace with the following:

- 5.7.1 When the *Contractor* considers the *Work* is completed, the *Contractor* shall submit an application for final payment along with a statutory declaration to state that, with the exception of holdbacks, all claims for payment of materials, labour and subcontract work,

on account of the *Work*, have been paid. The statutory declaration shall be provided and dated 5 days after the expiry of the latest statutory limitation period for filing liens applicable in the *Place of Work*.

*Add the following at the end of GC 5.7.1*

The Contractor shall include a Final Release and Indemnity in accordance with Schedule "A" with its application for final payment.

*Replace GC 5.7.4 with the following:*

- 5.7.4 Subject to the provision of GC 10.4 - WORKERS' COMPENSATION, the *Builders Lien Act*, and the provisions of this Contract, the Owner shall, no later than twenty calendar (20) days after the issuance of a final certificate of payment, pay the Contractor as provided in Article A-5 of the Contract – PAYMENT.

*Insert the following new paragraphs:*

- 5.7.5 The *Contractor's* acceptance of payment upon final completion shall constitute a waiver of all claims by *Contractor* against *Owner*, except for those having previously been notified to *Owner* as being formally in dispute.
- 5.7.6 Prior to the release of the final certificate of payment, the Contractor must submit any required occupancy permit, all inspection certificates, all test reports, close out documents, required as-built drawings, required spare stock, warranties, a reconciliation statement of all change orders and W.C.B. clearance release documents.
- 5.7.7 Neither the final payment nor any part thereof shall become due until the Contractor obtains and delivers to the Owner a complete release of any liens arising out of this Contract (other than his own), but the Contractor, may, if any Subcontractor or Supplier refuses to furnish a release of such lien, take all steps necessary to have such lien removed expeditiously
- 5.7.8 The issuance of final certificate of payment in no way relieves the Contractor from correcting deficiencies or defects not readily apparent at the time of issuance of this certificate.

## **GC 5.8 WITHHOLDING OF PAYMENT**

*Insert the following new paragraphs:*

- 5.8.2 The *Contractor* and the *Consultant*, prior to the release of final payment, shall carry out and complete a deficiency list of the *Work*. The *Consultant* will determine a suitable holdback value for each deficiency item. The amount withheld for deficiencies is an additional amount and independent of the funds withheld in accordance with the Builders Lien Act. All items shall be rectified prior to the release of the deficiency holdback. The cleared list shall be submitted with the final invoice.
- 5.8.3 In the event that items remain uncompleted and deficiencies have not been rectified in a timely manner in relation to the *Work*, the *Owner* may use the deficiency holdback funds to have the *Work* completed by other contractors and if deficiency holdback funds remain after the completion of the deficiencies the balance will be paid to the *Contractor*.

## **GC 6.1 OWNER'S RIGHT TO MAKE CHANGES**

*Add the following:*

- 6.1.3 No Changes in or additions to the Work shall be undertaken without written authorization of the Owner.
- 6.1.4 Where additional instructions provided by the Owner or the Consultant to the Contractor result in increased costs, the Contractor shall not be entitled to any reimbursement by the Owner for such costs unless the Contractor provides the Consultant with written notice of the increased costs within fifteen (15) Working Days of receiving the above instructions, in which case GC 6.1.1 and GC 6.1.2 shall apply.
- 6.1.5 The Contractor shall supply all necessary backup including labour and materials and equipment breakdowns to substantiate a claim for a Change.
- 6.1.6 The balance of the Work of the Contractor shall not be delayed pending agreement on resolution of the valuation of Changes.
- 6.1.7 The costs and effect on the Contract Time of each Change shall be dealt with separately and shall be deemed to include all direct, indirect and consequential costs associated with that Change, including, without limitation all impact costs, overhead and profits. No other claim for additional costs shall be considered or paid by the Owner.
- 6.1.8 The Contractor acknowledges that the Owner at all times desires to reduce the *Contract Price* and to improve the overall quality of the Project. The Contractor agrees to cooperate with the Owner and to make reasonable efforts to reduce the *Contract Price* through value engineering and other cost saving initiatives.

## **GC 6.3 CHANGE DIRECTIVE**

*Delete 6.3.6 and 6.3.7 and replace with the following:*

- 6.3.6 All *Work* to be conducted under a *Change Directive* shall be charged on a time and materials basis or a unit rate basis, as the Owner may elect.
- 6.3.7 The cost of performing the *Work* under a *Change Directive* shall be limited to the following:
  - .1 time spent for personnel in the direct employ of the *Contractor* and assigned to the *Work*, time spent for *Construction Equipment* and tools owned by *Contractor* and used to perform the *Work*, and materials and supplies used or incorporated into the *Work* by the *Contractor* under the *Change Directive* under a cost schedule agreed upon by the *Owner* and *Contractor* included with the *Contract Documents* or otherwise approved by *Owner*,
  - .2 costs for materials, equipment, supplies or other expenses not included under 6.3.7.1 that are expended and/or incorporated into the *Work* under the *Change Directive* including markup agreed upon by the *Owner* and *Contractor* identified in the *Contract Documents* or otherwise approved by *Owner*.

## **GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

*Add the following:*

- 6.4.5 The Contractor acknowledges that it has inspected the Place of the Work for the physical conditions described in GC 6.4.1 and has disclosed its findings to the Owner. The Contractor shall not be entitled to, and shall not claim, any additional compensation, or

extension of Contract Time as a result of any conditions that were or ought to have been discovered upon reasonable inspection by the Contractor prior to the date of the Contract.

- 6.4.6 No claims for additional compensation, or for an extension of Contract Time, shall be allowed if the Contractor fails to give notice to the Owner, as required by GC 6.4.1.

## **GC 6.5 DELAYS**

*Add the following:*

- 6.5.6 In the event that the Contractor is delayed or impacted in the execution of the Work for any reason other than one for which an extension is permitted under GC 6.5 or if the Contractor fails to submit a notice in writing as required by GC 6.5.4, fails to submit and update a Construction Schedule as required by GC 3.5 or fails to perform the Work substantially in accordance with the agreed Construction Schedule, the Contractor shall, at its own expense, take whatever measures are necessary to ensure the completion of the Work by the date stated in Article A-1 (1.3) of the Contract.
- 6.5.7 The entitlement of the Contractor to claim an extension of the Contract Time or reimbursement of costs, under GC 6.5, shall be subject to the condition that the Contractor shall have exercised all reasonable efforts to avoid, or minimize the duration, cost and impact of any delay or impact in respect of which a claim for extension of the Contract Time or compensation is made. The Contractor waives any claim for extension of Contract Time or compensation for delays or impacts, which do not adversely affect the critical path for achieving Substantial Performance of the Work, or which could have been avoided, minimized or mitigated by the Contractor using reasonable efforts.

## **GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE**

*Add to the end of paragraph 6.6.1:*

... not more than ten (10) *Working Days* from the event giving rise to the claim.

## **GC 6.8 ACTUAL DAMAGES**

*Insert the following new paragraph:*

- 6.8.1 The *Owner* and *Contractor* recognize that time is of the essence of the *Contract* and that the *Owner* may suffer financial loss if the *Work* is not completed in accordance with the *Contract Time*. The *Contractor* shall be solely responsible for any and all actual damages incurred by the *Owner* resulting or arising, directly or indirectly, from any failure to perform the *Work* in accordance with the *Contract Time*. Such actual damages shall include, but are not limited to, *Consultant* costs to the *Owner* and *Owner* cost incurred associated with temporary on-Site storage of waste materials intended for disposal in Phase D West or transportation of waste materials intended for disposal in Phase D West to and disposal at an off-Site disposal facility.
- 6.8.2 The *Contractor* shall not be assessed with actual damages for delays as identified in GC 6.5.1 to 6.5.3.
- 6.8.3 The *Owner* may deduct the amounts described in this GC 6.8 from any monies due or to become due to *Contractor* or otherwise available therefor or, at *Owner's* option, *Contractor* shall promptly pay such amounts to the *Owner* (or such remaining amounts after such deduction). No such deduction or payment or any other deduction or retention by the *Owner* or payment or reimbursement by the *Contractor* pursuant to the *Contract* shall relieve the *Contractor* from any obligation under the *Contract* or otherwise.

- 6.8.4 Permitting the *Contractor* to continue and finish the *Works* after the time fixed for its completion or after the date to which the time for completion may have been extended and/or acceptance of payment of damages hereunder, will in no way excuse the *Contractor's* breach of the *Contract* nor operate as a waiver on the part of the *Owner* of any of its rights under the *Contract* or otherwise.

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

*Amend GC 7.1.4.1 as follows:*

- 7.1.4.1 Delete the words "provided the Consultant has certified such cost to the Owner and the Contractor".

*Amend GC 7.1.5.3 as follows:*

- 7.1.5.3 Delete the words "as certified by the Consultant"

*Insert the following new paragraphs:*

- 7.1.7 The *Owner* may, with or without cause, terminate further performance of all or part of the *Work* by providing the *Contractor* with written notice specifying the date of termination. On the date of the termination stated in the notice, the *Contractor* shall discontinue performance of the *Work* and shall preserve and protect tools, construction equipment and facilities on the Site, materials and plant equipment purchased for or committed to the *Work* (whether delivered to the Site or on order). The *Work* in progress and completed *Work* (whether at the Site or at other locations) pending the *Owner's* instructions and, if requested by the *Owner*, shall turn over the same to the *Owner*, including title to said drawings, materials and plant equipment or dispose of same in accordance with the *Owner's* instructions.

- 7.1.8 Upon receipt of the termination notice, the *Contractor* shall advise the *Owner* of its outstanding subcontracts pertaining to the performance of the terminated work and, upon request, shall furnish the *Owner* with complete copies of the subcontracts. The *Contractor* shall enter into no further subcontracts except as may be necessary for the completion of such portion of the *Work* as is not terminated. The *Contractor* shall promptly make every reasonable effort to procure cancellation, upon terms satisfactory to the *Owner* of all subcontracts to the extent they relate to the performance of the terminated *Work* or, as directed by the *Owner*, shall assign to the *Owner* in a form satisfactory to the *Owner* the subcontracts designated by the *Owner* or the *Contractor* shall take such other action relative to the subcontracts as directed by the *Owner*.

- 7.1.9 If the *Contractor* has fully and completely performed all of its obligations under this *Contract* up to the date of termination, the *Contractor* shall recover from the *Owner* a complete and full settlement for such termination for the *Work* performed under this *Contract* as follows:

- .1 the actual cost of such *Work* that was satisfactorily executed to the date of termination,
- .2 less such sums as the Contractor has already received on account of the *Work* performed.

The total payment to the *Contractor* shall not exceed the *Contract Price*.

- 7.1.10 All requests for compensation herein shall be submitted to the *Owner* in accordance with the provisions of PART 6 CHANGES TO THE WORK. The *Contractor* shall not be entitled to any prospective profits or any damages.

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

Amend paragraph 7.2.2 by deleting the words "**20 Working Days**" and replace with "**40 Working Days**".

Amend paragraph 7.2.4 by deleting the words "**5 Working Days**" and replace with "**10 Working Days**".

*Amend GC 7.2.4 as follows:*

- 7.2.4 After the words "within five (5) Working Days" in the second line add the words ", or such longer period as may reasonably be required to correct any default of the type described in subparagraph 7.2.3 (provided that in no event will there be an extension for payment defaults)".

*Replace GC 7.2.5 with the following:*

- 7.2.5 If the Contractor terminates the Contract under the conditions set out above, the Owner shall pay to the Contractor all amounts due to the Contractor on account of the Contract Price earned to that date together with reasonable and properly documented costs incurred by the Contractor in demobilizing and terminating its contracts with Subcontractors and Suppliers.

## **PART 8 DISPUTE RESOLUTION**

*Delete GC 8.1 and substitute the following:*

### **GC 8.1 AUTHORITY OF THE CONSULTANT**

- 8.1.1 The parties wish to ensure that the performance of the Work will proceed without disruption caused by delays in finalizing matters affecting the Contract Price and the scope of the Work and further wish to make every effort to conclude the Work to the extent possible without having outstanding, unresolved claims and disputes. To that end this Dispute Resolution process is intended to ensure that smaller disputes commonly arising in construction projects during the course of the Work are resolved immediately and in a final and binding way.
- 8.1.2 The Consultant will be the first instance determiner in respect of the following:
- a) issues regarding whether something constitutes a Change for the purpose of issuance of Change Orders or Change Directives,
  - b) valuation of Change Orders and Change Directives,
  - c) determination of deficiencies,
  - d) quantification or allocation of deficiency holdbacks; and
  - e) valuation of applications for payment.
- 8.1.3 If the Consultant makes a determination in respect of any of the items listed in GC 8.1.2 that has a claimed value of \$50,000 or less (excluding taxes), this determination will be final and binding on the parties. Any determination by the Consultant shall be without prejudice to any subsequent claim or claims involving the same issue. If a party anticipates that an issue requiring determination by the Consultant may impact the legitimacy or value of more than one Change Orders or Change Directives, that party may, at its sole option, advise the Consultant of an intent to defer determination and have those matters bundled for presentation to and determination by the Consultant at the same time, in which case

the claimed value for the purposes of whether the determination will be final and binding, will be the total aggregated value of all bundled claims requiring determination.

## **GC 8.2 Determination, Negotiation, Litigation**

*Insert the following:*

- 8.2.1 In respect of a determination by the Consultant of any matter listed in GC 8.1.2 or any bundled claim, with a claimed value in excess of \$50,000 (excluding taxes), a party shall be conclusively deemed to have accepted the determination of the Consultant and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that determination unless, within 20 Working Days of being advised of the Consultant's determination, the disputing party sends to the other a Notice in Writing, notifying the other writing that it disputes the Consultant's determination. A Subcontractor's Notice in Writing of dispute will be forwarded to the Owner by and through the Contractor.
- 8.2.2 If either party, or a Subcontractor, disputes a determination by the Consultant:
- (a) The Owner shall nonetheless pay the amount determined by the Consultant;
  - (b) The parties shall continue with the Work;
  - (c) The parties shall make all reasonable efforts to resolve disputes by amicable negotiations and agree to provide frank, candid and timely disclosure of relevant facts, information and documentation to facilitate these negotiations. If unable to resolve the dispute within 5 Working Days of a Notice in Writing, the parties will appoint a mediator. The mediated negotiations shall be conducted in accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing.
- 8.2.3 If the dispute has not been resolved within 10 Working Days after the mediator was requested under 8.2.2 or within such further period agreed by the parties, the mediator shall terminate the mediated negotiations by giving Notice in Writing to the Owner, the Contractor and the Consultant.
- 8.2.4 For any dispute of a type that is not listed in GC8.1.2, a party shall be conclusively deemed to have accepted a finding of the Consultant under GC 2.2 – ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 Working Days after receipt of that finding, the party sends a Notice in Writing of dispute to the other party and to the Consultant, which contains the particulars of the matter in dispute and the relevant provisions of the Contract Documents. The responding party shall send a Notice in Writing of reply to the dispute within 10 Working Days after receipt of such Notice in Writing setting out the particulars of this response and any relevant provisions of the Contract Documents.
- 8.2.5 The parties shall make all reasonable efforts to resolve a dispute under 8.2.4 by amicable negotiations and agree to provide, without prejudice, frank, candid and timely disclosure of the relevant facts, information and documents to facilitate these negotiations. After a period of 10 Working Days following receipt of a responding part's Notice in Writing of reply under paragraph 8.2.4, the parties shall appoint a mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the Rules for Mediation of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing. If the dispute has not been resolved within 10 Working Days after mediation was requested under this section, the mediator shall terminate the mediated negotiations by giving Notice in Writing to the Owner, the Contractor and the Consultant.

In GC 8.2.6, replace the reference to "paragraph 8.2.5" with a reference to "paragraphs 8.2.3 or 8.2.5".

## GC 9.1 PROTECTION OF WORK AND PROPERTY

Replace GC 9.1.2 with the following:

- 9.1.2 The Contractor is solely responsible for determining, protecting or relocating all underground utilities and structures that may be impacted by the performance of the Work.

Insert the following new paragraphs:

- 9.1.5 The information and data shown or indicated in the *Contract Documents* with respect to existing underground utilities at or contiguous to the Site is based on information and data furnished to *Owner* or *Consultant* by the owners of such underground utilities, including *Owner*, or by others. Unless it is otherwise expressly provided in the *Contract Documents*, *Owner* and *Consultant* shall not be responsible for the accuracy or completeness of any such information or data, and the cost of all of the following shall be included in the *Contract Price*, and *Contractor* shall have full responsibility for:

1. reviewing, checking, and independently verifying all such information and data;
2. locating all underground utilities that are shown or indicated in the *Contract Documents* or that otherwise may interfere with or be affected by the *Work*;
3. coordination of the *Work* with the owners of such underground utilities, including *Owner*, during performance of the *Work*; and
4. the safety and protection of all such underground utilities and repairing any damage thereto resulting or arising, directly or indirectly, from the *Work*.

## GC 9.3 ARTIFACTS AND FOSSILS

Add the following in 9.3.2 after the words “Contractor shall...”:

...comply with the requirements of the British Columbia *Heritage Conservation Act*...

## GC 9.4 CONSTRUCTION SAFETY

Add the following:

- 9.4.3 If the Owner is of the reasonable opinion that the Contractor has not taken such precautions as are necessary to ensure compliance with the requirements of GC 9.4.1, the Owner may take or order any remedial measures which it deems necessary, including stopping the performance of all or any portion of the Work, and the Owner may use the employees of itself, the Contractor, any Subcontractor or any other contractors to perform such remedial measures. The Contractor acknowledges and agrees that any failure by the Contractor to comply with the Safety Requirements or the Safety Guidelines shall constitute a default pursuant to GC 7.1.2.

- 9.4.4 Where the Contractor is not the Prime Contractor, or during any period of time when the Contractor is not the Prime Contractor, the Contractor:

- .1 shall follow all reasonable directions issued by the Prime Contractor regarding compliance with the Safety Regulations; and
- .2 the Contractor waives any claim for an extension of Contract Time or compensation for costs incurred as a result of the Contractor's compliance with any directions referred to in paragraph 9.4.4.1.



## **GC 10.1 TAXES AND DUTIES**

*Add the following:*

- 10.1.3 When an exemption or recovery of government sales taxes is applicable to the Contract, the Contractor shall, at the Owner's expense, apply for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the Owner.
- 10.1.4 The Contractor shall compute and disclose separately on each invoice the amount of Value Added Taxes in respect of that invoice.
- 10.1.5 The Contractor shall remit to the appropriate taxing authority all taxes and Value Added Taxes and shall provide to the Owner appropriate documentary evidence of such remittance.

## **10.2 LAWS, NOTICES, PERMITS, AND FEES**

*Add the following:*

- 10.2.8 The Contractor shall comply and require that all Subcontractors comply with all Laws which apply to the Contractor's or Subcontractor's operations in respect of the Work and shall provide the Owner with evidence of such compliance on request.

## **GC 10.4 WORKERS' COMPENSATION**

*Insert the following new paragraphs:*

- 10.4.3 The *Contractor* agrees that it shall at no additional cost to the *Owner* procure and carry or cause to be procured and carried and paid for, full Workers' Compensation Board coverage for itself and all workers, employees, servants, and others engaged in or upon any work or service which is the subject of this *Contract*. The *Contractor* agrees that the *Owner* has the unfettered right to set off the amount of the unpaid premiums and assessments for such Workers' Compensation Board coverage against any monies owing by the *Owner* to the *Contractor*. The *Owner* shall have the right to withhold payment under this *Contract* until the Workers' Compensation Board premiums, assessments, or penalties in respect of work done or service performed in fulfilling this *Contract* had been paid in full.
- 10.4.4 The *Contractor* shall be the Prime Contractor for the purposes of the *Workers' Compensation Board Industrial Health and Safety Regulations* for the Province of British Columbia. The *Contractor* shall have a safety program acceptable to the Workers' Compensation Board and shall ensure that all Workers' Compensation Board safety rules and regulations are observed during performance of this *Contract*, not only by the *Contractor* but by all *Subcontractors*, *Consultants*, workers, material Suppliers, and others engaged in the performance of this *Contract*. Prior to commencement of the *Work*, the *Contractor* shall complete and file a "Construction Notice of Project" with the Workers' Compensation Board and shall provide a copy of the same to *Owner* confirming that *Contractor* shall be the Prime Contractor responsible for coordination of safety and health under Part 3 of the Workers Compensation Act and Part 20 of the WCB Occupational Health & Safety Regulations.
- 10.4.5 The *Contractor* shall provide the *Owner* with the *Contractor's* Workers' Compensation Board registration number and a letter from the Workers' Compensation Board confirming that the *Contractor* is registered in good standing with the Workers' Compensation Board and that all assessments have been paid to the date thereof prior to the *Contractor* having any obligation to pay monies under this *Contract*.

- 10.4.6 The *Contractor* shall indemnify and defend the *Owner* from and against all claims, demands, costs, losses, penalties, and proceedings arising out of or in connection with unpaid Workers' Compensation Board assessments owing from any person or corporation engaged in the performance of this *Contract* or arising out of or in any way related to the failure to observe safety rules, regulations, and practices of Workers' Compensation Board, including penalties levied by the Workers' Compensation Board.

## **GC 11.1 INSURANCE**

*Amend the insurance limits required by CCDC 41 as follows:*

1. General liability insurance shall be with limits of not less than \$5,000,000 per occurrence and an aggregate limit of not less than \$5,000,000 within any policy year.
2. Automobile liability insurance shall have limits of not less than \$2,000,000 inclusive per occurrence.

*Delete paragraph 11.1.1.5 of CCDC 4 and paragraph 5 of CCDC 41.*

*Replace paragraph 11.1.2 with the following:*

- 11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage by way of an acceptable certificate of insurance and copies of any amending endorsements applicable to the *Work*.

*Add paragraph 8 to CCDC 41 as follows:*

- 8 *Contractor* must carry pollution liability insurance coverage with the policy limits of not less than \$5,000,000 per occurrence and an aggregate limit of not less than \$5,000,000 within any policy year. Coverage shall be provided to cover the scope of the Works specified in the Contract Documents and shall apply to sudden and accidental and gradual and accidental pollution conditions.

*Add the following:*

- 11.19 The Contractor and everyone engaged by the Contractor, its Subcontractors and Suppliers, shall obtain, maintain and pay for any insurance that they deem necessary or that they are required to provide by law.

## **GC 11.2 CONTRACT SECURITY**

*Replace paragraphs 11.2.1 and 11.2.2 with the following:*

- 11.2.1 Not later than 7 days after the date of Notice of Award, *Contractor* shall furnish to *Owner* an executed Performance Bond in an amount equal to at least 50 percent of the *Contract Price* as security for the faithful performance of all *Contractor's* obligations under the *Contract*, and also shall furnish to *Owner* a separate executed Payment Bond in an amount equal to at least 50 percent of the *Contract Price* as security for the payment of all persons performing labor and furnishing materials in connection with the *Contract*.
- 11.2.2 Bonds shall be in the form of CCDC 221 and CCDC 222, except as provided otherwise by *Laws and Regulations*, and shall be executed by such sureties as are acceptable to *Owner*. Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. Bonds required by the *Contract Documents* to be purchased and maintained by *Contractor* shall be obtained from such surety company or companies as are approved by *Owner*, and as are duly licensed or authorized to transact business in the

jurisdiction in which the *Site* is located, and to issue bonds for the limits and coverages so required. Bonds shall be approved by *Owner* prior to execution of the formal *Contract* and shall remain in full force and effect for no less than 1 year after the date when final payment under the *Contract* becomes due, except as provided otherwise by *Laws or Regulations* or by the *Contract Documents*.

- 11.2.3 If the surety on any bond furnished by *Contractor* is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the *Project* is located or it ceases to meet the requirements of Paragraph 11.2.2, *Contractor* shall within 20 days thereafter substitute another Performance and Payment bond and surety, both of which shall comply with requirements of this GC 11.2.
- 11.2.4 The Contractor shall be solely responsible for determining which surety bonds are required with respect to the portions of the Work to be performed by its Subcontractors and Suppliers.

## **GC 12.1 INDEMNIFICATION**

*In 12.1.2.1, add the following after the reference to CCDC 41:*

“as amended by the Supplementary Conditions”

*In 12.1.2, replace the reference to \$2,000,000 with \$5,000,000.*

*Insert the following new paragraphs:*

- 12.1.7 The *Contractor* shall extend its indemnity obligations under GC 12.1 to include *Consultant*.

## **GC 12.2 WAIVER OF CLAIMS**

*Delete GC 12.2.3, 12.2.4 and 12.2.5.*

## **GC 12.3 WARRANTY**

*Amend GC 12.3.2 as follows:*

- 12.3.2 Delete the following from GC 12.3.2 “to the extent that the design and Contract Documents permit such performance.”

*Amend GC 12.3.4 as follows:*

- 12.3.4 In the first line of GC 12.3.4, delete reference to GC 12.3.2.

*Add the following:*

- 12.3.7 The Contractor shall assign to the Owner the benefit of all guarantees and warranties for all Products and Work used or incorporated in the Work and shall ensure that such assignment is also effected by all Subcontractors, Suppliers or consultants from whom the same have been obtained. Thereafter, as reasonably required by the Owner, the Contractor shall make, do, execute and deliver such instruments in writing as may be necessary or desirable to assure the enforceability of such guarantees and warranties.
- 12.3.8 Subject to any other provisions in the Contract Documents, the Contractor shall remedy all defects due to faulty products and/or workmanship appearing within the Warranty Period and shall pay for all damage to other work arising from such defects within the Warranty Period. No certificate issued pursuant to the Contract shall relieve the Contractor from this responsibility.

- 12.3.9 The issuance of any certificate in no way relieves the Contractor from correcting deficiencies or defects not readily apparent at the time of issuance of this certificate.
- 12.3.10 The Owner shall give notice of any defect within a reasonable time of observing such defect. The Contractor shall remedy all defective products and/or workmanship:
- .1 immediately in the case of defects affecting health or safety and any other critical defects;
  - .2 as quickly as possible and in no event more than thirty (30) calendar days after receipt of written notice from the Owner or such time as the Consultant determines is reasonable in the case of defects causing further damage to the Project or affecting the usability of the Work; and
  - .3 prior to the expiry of the Warranty Period for the remediation of all other defects.
- 12.3.13 Completion and/or correction of incomplete and/or deficient products and/or material items noted at Substantial Performance of the Work shall be done promptly and within a reasonable time. When such items have not been completed within a reasonable time, especially within the Warranty Period, the Warranty Period shall be extended, at no additional cost to the Owner, so as to commence at such time when such incomplete and/or deficient work is completed.
- 12.3.14 The carrying out of replacement work and making good of all defects shall be executed at such time as is convenient to the Owner. This may entail overtime work on the part of the Contractor. Additional charges for overtime work in this regard shall be borne by the Contractor. Prior to the expiry of the Warranty Period, the Owner reserves the right to carry out a detailed and exhaustive inspection of the Work. The Contractor shall be required to make good the defective or unsatisfactory materials and/or workmanship identified by the Owner.
- 12.3.15 Nothing in this Contract shall be deemed to limit any rights of the Owner to sue the Contractor either at law or in equity on any cause of action arising out of its performance of or failure to perform the terms of this Contract, or to claim damages, contribution or indemnity from the Contractor or any other person under the terms of this Contract.

#### **GC 12.4 MAINTENANCE SECURITY**

*Add 12.4 Maintenance Security and the following new paragraphs:*

- 12.4.1 *Owner* will retain until the expiry of 12 months after the date of Substantial Performance, or 12 months after the date of completion of the *Work*, a maintenance security in the amount of 3 percent of the *Contract Price* that may be applied by *Owner* in satisfaction of any claims as a result of default by the *Contractor* respecting the *Contractor's* obligations during the Warranty Period prescribed in GC 12.3.
- 12.4.2 The maintenance security will be used only to deal with deficiencies and failures directly related to the works that arise during the Warranty Period that are not addressed by *Contractor* within: 24 hours for critical health or safety problems or 5 working days for minor cosmetic problems upon written notification by *Owner* that a problem exists and in a manner consistent with the Contract Documents.
- 12.5.3 Should *Contractor* fail to repair any deficiency within the prescribed time, or should *Owner* deem a deficiency to need emergency repair during the Warranty Period, *Owner* may pay for the repair and deduct the amount from the maintenance security.

- 12.5.4 The maintenance security, which is at no time part of the statutory holdback, or any monies held back for known deficiencies at the time of Substantial Performance, shall be retained by *Owner* in increments from monies that would otherwise be payable to *Contractor*, commencing during the latter part of the period of construction, so that by the date of Substantial Performance the full value of the required maintenance security has been retained.
- 12.5.5 At the time of Substantial Performance, the amount of the maintenance security may be replaced by *Contractor*, at his option, with an irrevocable, self-renewing Letter of Credit in a form approved by *Owner*.
- 12.5.6 After the Warranty Period has expired, *Consultant* will issue the Final Acceptance Certificate and a payment certificate for release of the maintenance security (total amount collected less any amounts expended to carry out any maintenance or repairs related to the Project). Upon *Consultant's* request, *Contractor* shall submit satisfactory evidence of compliance with workers' compensation legislation, evidence of continuation of insurance required, and *Contractor's* final release of all claims. After *Owner* is satisfied that no liens were registered, the amount recommended by *Consultant* will become due, and when due will be paid by *Owner* to *Contractor*. Acceptance of final payment by *Contractor* shall constitute a waiver of all claims by *Contractor* against *Owner* and *Consultant*.

### **GC 13 MISCELLANEOUS**

*Add the following:*

- 13.1 Title to the Work and all portions thereof during and after construction, together with all Products on the Place of the Work, are vested in the Owner.
- 13.2 The Contractor shall use its best effort to check all Contract Documents before starting the Project to ensure all issues related to dimensions, Municipal, Provincial and/or National codes, regulations and detailing are correct and understandable.
- 13.3 The Contractor agrees that all notes appearing on the Contract Documents shall be included in the Contract.
- 13.4 The Contractor confirms that it is an expert in this field of work and is fully knowledgeable and experienced in all aspects of required procedures, methods, regulations, codes and municipal requirements and understands that the Owner is relying on this expertise, knowledge and experience.
- 13.5 The Contractor is to ensure that a competent supervisor is at the Place of the Work whenever the Work is being performed and is available during site inspections and/or site meetings to answer questions and carry out instructions as issued by Consultant or the Owner.
- 13.8 The Contract Price includes Workers Compensation Board coverage for all of the Contractor's labour, all Provincial Sales taxes for Products supplied by the Contractor and all business licensing fees.
- 13.9 The Contractor shall take all reasonable steps to ensure that all Products that are delivered to the Place of the Work are stored securely and adequately so as to protect against damage to or loss of such Products including, without limitation, damage or loss resulting from theft, vandalism, accident or the effects of the elements and the Owner is not responsible for theft, loss and/or vandalism of any of the Contractor's Products and/or work.
- 13.10 Notwithstanding any provisions of the Contract Documents to the contrary, no approval, review or inspection by the Consultant or the Owner or any person acting on their behalf,

of the Work or any submittals by the Contractor shall relieve the Contractor of its obligation to perform and complete the Work in accordance with the Contract Documents.

- 13.14 The Contractor is responsible for the coordination of metric and imperial dimensions as shown on the drawings and as specified.
- 13.15 The Contractor is responsible to coordinate all drawings to totally complete the Work.
- 13.16 The drawings are a diagrammatic view of the Work required but do not limit the extent of the work required to totally complete the details and work intended. It is the Contractor's responsibility to apply their expertise to execute the intended work shown on the details and drawings. The Contractor shall coordinate all drawings with the sizes and dimensions of services, fixtures and equipment in the locations shown on the plans or as job conditions permit. Any changes required to facilitate and complete the installation of such services, fixtures or equipment shall be made at no additional cost to the Owner, unless a Change Order has been issued or there has been a negligent error or omission by the Consultant or the subconsultants.

**Schedule "A" – Final Release and Indemnity**

**DATE:** \_\_\_\_\_

**TO:** \_\_\_\_\_ (the "Owner")

**FROM:** \_\_\_\_\_ (the "Contractor")

**RE:** \_\_\_\_\_

In consideration of the sum of \_\_\_\_\_ the receipt of which is hereby acknowledged, and other good and valuable consideration, the Contractor hereby acknowledges that the Owner has paid and satisfied in full all monies due for all work performed and material whatsoever installed and supplied by the Contractor to the above Project (collectively the "Work") pursuant to the contract for various work between the Owner and the Contractor (the "Contract") and the Contractor has no further claims against the Owner arising out of the Work, the Contract and/or the Project, excepting the following specific claims (the "Claims") which are identified and quantified herein:

- \_\_\_\_\_ (\$ \_\_\_\_\_ ) \_\_\_\_\_
- \_\_\_\_\_ (\$ \_\_\_\_\_ ) \_\_\_\_\_
- \_\_\_\_\_ (\$ \_\_\_\_\_ ) \_\_\_\_\_

Except as hereinbefore provided, the Contractor hereby releases and discharges the Owner of and from any and all actions, causes of action, suits, debts, duties, accounts, claims, damages, costs and demands which the Contractor now has, ever had or hereinafter can, shall or may have for or by reason of any cause, matter or thing arising out of the Work, Contract and/or the Project (including, without limitation, the assignment provided in favour of the Contractor), excepting the Claims and such third-party claims as may be brought against the Contractor (and for which the Owner or those for whom the Owner is responsible in law may be held liable).

Except for the Claims, the Contractor further represents that no supplier or sub-contractor of it has any right to file any claim of lien under the Builders Lien Act against the Project nor have any claims of lien been filed or registered by such supplier or sub-contractor and, if such claims of lien are filed or registered or trust fund claim or Workers Compensation Act claim is made, the Contractor will indemnify the Owner and save the Owner harmless from any and all claims and any loss or damage which the Owner may suffer as a result, and the Owner is authorized hereby to take any and all steps and make such payments as may be necessary to discharge the claims of lien under the Act or trust fund claim and/or pay to satisfy the Workers Compensation Act claim, and the Contractor hereby covenants to reimburse the Owner for such costs.

The Contractor acknowledges and warrants that the person executing this Final Release and Indemnity on its behalf is authorized to do so.

Every reference to the "Owner" and the "Contractor" includes their respective heirs, executors, administrators, receivers, trustees, predecessors, successors, officers, directors, shareholders, agents, employees and assigns, as the case may be.

The terms of the Final Release and Indemnity are contractual and not mere recitals. No agreements, covenants, warranties or representation of any kind whatsoever have been made or relied upon by the Contractor, except as expressly set forth in this Final Release and Indemnity.

The Contractor acknowledges that the facts in respect of which this Final Release and Indemnity is made may prove to be other than or different from the facts which the Contractor at the present time understand to be true, and the Contractor agrees that this Final Release and Indemnity shall be in all respects enforceable and not subject to termination, rescission or variation if its present understanding of said facts is incorrect.

If any term of this Final Release and Indemnity is held to be void, voidable or unenforceable, the Contractor agrees that said term shall be severed from this Final Release and Indemnity and the remaining terms thereof shall remain in full force and effect.

This Final Release and Indemnity is governed by the laws of the Province of British Columbia.

IN WITNESS WHEREOF the Contractor has duly executed this Final Release and Indemnity on the day and year first above written.

---

Authorized Signatory

c/s

---

Title



END OF SUPPLEMENTARY CONDITIONS

# Form of Bid

**Form of Bid**

Phase 2 MSW Area Closure  
Terrace Landfill  
Terrace, British Columbia

Offered By:            Name: \_\_\_\_\_  
                                 Date: \_\_\_\_\_

Communications concerning the bid shall be addressed to:

Contact Person:        Name: \_\_\_\_\_  
                                 Address: \_\_\_\_\_  
                                 \_\_\_\_\_  
                                 Tel. No. \_\_\_\_\_  
                                 Fax No. \_\_\_\_\_

Offered To:            Attention: Ann Maher  
                                 City of Terrace  
                                 via email at [amaher@terrace.ca](mailto:amaher@terrace.ca)

**Fb.01 Bid Price**

We, the undersigned bidder, having carefully examined the bid documents and carefully examined, inspected, investigated, explored, tested, and studied the Site and being familiar with (i) on-Site and local conditions affecting or which may affect the cost, progress, performance, and furnishing of the Works; (ii) Laws or Regulations affecting the Works; and (iii) the bid documents and related documents referred to therein, Drawings, and Addenda, hereby agree to perform the Works of the quality and in the manner and time specified in the Project Specifications; to perform all other obligations and assume all liability imposed upon the bidder by the bid documents; to perform Force Account Work upon the written request of ENGINEER in accordance with the specified requirements of the bid documents and to accept as full compensation for such work the terms of payment as set out therein; and to provide all labor, supervision, materials and equipment, Plant and Equipment, supplies, services, transportation, facilities, and all else necessary to complete the Works in the manner specified in the bid documents to the satisfaction of ENGINEER for the unit prices and lump sums named in the attached Schedule of Prices including GST and other taxes having a total (based on quantities entered in the Schedule of Prices in the case of unit price items) of

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

(Write amount of total bid price in words)

**Fb.02 Bid Irrevocable**

This bid shall be irrevocable for 90 days from the time and date of bid closing in accordance with the Instructions to Bidders, or for such longer period of time that bidder may agree to in writing upon request of OWNER.

**Fb.03 Attachments**

The following documents are attached to and form part of this bid:

- 1. Schedule of Information.

2. Schedule of Prices.
3. All appendices, attachments, and exhibits to any of the foregoing.

**Fb.04 Statement of Qualifications**

The bidder shall provide, as Appendix 1 to the bid, a Statement of Qualifications relevant to the Works that includes information including previous project names, descriptions, locations, clients, approximate values, and completion dates. Also include the resumes of the key personnel listed in Schedule of Information, paragraph 6.

**Fb.05 Addenda Received**

The bidder acknowledges receipt of Addenda numbered \_\_\_ to \_\_\_, issued during the bid period, and acknowledges that the provisions set out in the issued Addenda form part of these bid documents and further acknowledges that the total bid price includes the provisions set out in the issued Addenda.

**Fb.06 Insurance Coverage**

**A. Certificate of Insurance Availability**

The bidder submits as an attachment to the bid a Certificate of Insurance Availability on the form furnished as Appendix 2 to address the insurance coverage requirements specified in CCDC 4 GC 11.1, Supplementary Condition GC11.1, and CCDC 41.

**B. Exclusions/Special Restrictions**

The bidder shall list below any exceptions to the insurance coverage requirements specified in CCDC 4 GC 11.1, Supplementary Condition GC11.1, and CCDC 41. (List on separate page if more space is required.)

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**D. Worker’s Compensation Experience Rating**

The bidder shall indicate in the space provided below its Experience Rating under the British Columbia Workers Compensation Act for the last 3 years, and its renewal date.

Year:	_____	Rate Factor:	_____
Year:	_____	Rate Factor:	_____
Year:	_____	Rate Factor:	_____
Renewal Date:	_____		

**Fb.07 Bid Bond and Agreement to Bond**

The bidder submits, as an attachment to the bid, a Bid Bond on the form of CCDC 220 and issued by \_\_\_\_\_ in the amount of \$\_\_\_\_\_ dated the \_\_\_\_\_ day of \_\_\_\_\_ 2023 having serial number \_\_\_\_\_ and naming City of Terrace as Obligee.

In addition to the specified Bid Bond, the bidder submits, as an attachment to the bid, an Agreement to Bond on the form furnished as Appendix 3, and issued by \_\_\_\_\_.

**Fb.08 Proposed Progress Schedule**

The bidder shall submit, as Appendix 4 to the bid, its proposed progress schedule for the Works in the form of a bar graph indicating the times (number of days or dates) for starting and completing the various stages of the Works, including any Milestones. The schedule shall show proposed progress on a weekly basis, and proposed sequencing and coordination of interrelated work activities. The schedule shall also identify activities on the critical path. The schedule shall provide an orderly progression of the Works to completion within the Milestones and Contract Times specified in Section 01 00 00 of the Project Specifications.

**Fb.09 Schedule of Additional Unit Prices**

The bidder shall submit, as Appendix 5 to the bid, its proposed Schedule of Additional Unit Prices for the Works. CONTRACTOR agrees to accept payment at the Schedule of Additional Unit Prices for work done and materials supplied if and when directed by ENGINEER. The Unit Prices shall include all fees, taxes, profit, overhead, and similar items. The prices submitted in the Schedule of Additional Unit Prices do not affect the Contract Price for the Works. The prices will be reviewed by ENGINEER. ENGINEER reserves the right to delete any price from the Schedule of Additional Unit Rates that in the opinion of ENGINEER is unbalanced or excessive; in such case work done under the item deleted will be negotiated with CONTRACTOR under unit rates, time and materials, or other agreed upon rate schedule, or not completed at the direction of the ENGINEER.

**Fb.10 Schedule of Personnel Rates and Equipment Rental Rates**

The bidder shall submit, as Appendix 6 to the bid, its proposed Schedule of Personnel Rates and Equipment Rental Rates for the Works. Appendix 6 will list CONTRACTOR personnel and contain the CONTRACTOR owned and CONTRACTOR rented equipment and the associated rental rates proposed for the Works. Equipment listed that is not CONTRACTOR owned shall be clearly identified. The Schedule of Personnel Rates and Equipment Rental Rates shall contain all-inclusive rates which include Operators where applicable, servicing, fuels, lubricants, maintenance, repairs and all other services, fees, taxes, overhead, profit, and similar items. Rates shall exclude decontaminating the equipment and mobilization/demobilization charges. The rates submitted in the Schedule of Personnel Rates and Equipment Rental Rates do not affect the Contract Price for the Works. The rates will be reviewed by ENGINEER. ENGINEER reserves the right to delete or negotiate with CONTRACTOR any price from the Schedule of Personnel Rates and Additional Unit Prices that in the opinion of ENGINEER is unbalanced or excessive.

**Fb.11 Cross References**

Information requested in the various sections of the Form of Bid for which there is insufficient space provided therein, has been included in an Appendix to the bid as identified in Fb.12 and has been clearly worded to identify to which section of the Form of Bid it is an Appendix.

## **Fb.12 Appendices**

The following Appendices are submitted with the bid and form part of the Form of Bid:

1. Appendix 1 - Statement of Qualifications
2. Appendix 2 - Certificate of Insurance Availability
3. Appendix 3 - Agreement to Bond
5. Appendix 4 - Proposed Progress Schedule
6. Appendix 5 - Schedule of Additional Unit Prices
7. Appendix 6 - Schedule of Personnel and Equipment Rental Rates

**Fb.13 Signing Authority**

SUBMITTED ON \_\_\_\_\_, 2023

Provincial Contractor License No. (if applicable): \_\_\_\_\_

If Bidder is:

**A Corporation**

Corporation Name: \_\_\_\_\_ (SEAL)

Province of Incorporation: \_\_\_\_\_

Type (General Business, Professional, Service, Limited Liability): \_\_\_\_\_

By: \_\_\_\_\_  
(Authorized Signature - attach evidence of authority to sign)

\_\_\_\_\_  
(Name and Title of Person Signing - typed or printed)

Attest: \_\_\_\_\_  
(Signature of Corporate Secretary)

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Phone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Email: \_\_\_\_\_

Date of Qualification to do business is: \_\_\_\_\_

**A Partnership**

Partnership Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of general partner - attach evidence of authority to sign)

\_\_\_\_\_  
(Name and Title of Person Signing - typed or printed)

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Phone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Email: \_\_\_\_\_

**A Joint Venture**

Name of Joint Venturer: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of joint venture partner - attach evidence of authority to sign)

\_\_\_\_\_  
(Name and Title of Person Signing - typed or printed)

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Phone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Name of Joint Venturer: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of joint venture partner - attach evidence of authority to sign)

\_\_\_\_\_  
(Name and Title of Person Signing - typed or printed)

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Phone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Email: \_\_\_\_\_

Phone and Facsimile Number, and address for receipt of official communications:  
\_\_\_\_\_  
\_\_\_\_\_

Note: Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.

**An Individual**

Name (typed or printed): \_\_\_\_\_

By: \_\_\_\_\_ (SEAL)  
(Individual's signature)

Doing business as: \_\_\_\_\_

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Phone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Email: \_\_\_\_\_



**Schedule of Information**

**1. Identification of Suppliers**

The following material suppliers (including geotextile, Geosynthetic Clay Liner, Flexamat, culverts, and manholes) are proposed for the Works. (List on separate pages if more space is required and attach additional information as necessary.)

A. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

B. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

C. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

D. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

E. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

F. Name of Supplier: \_\_\_\_\_  
Material: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
\_\_\_\_\_

## Schedule of Information

### 2. List of Subcontractors

The following list of Subcontractors together with a description of the item(s) of work to be undertaken by each are proposed for the Works. (List on separate page if additional space is required.) Do not list alternate Subcontractors for the same work.

The employment of Subcontractors other than those listed with the bid will not be permitted without written approval from OWNER or ENGINEER. Information indicating how the Subcontractors listed qualify in experience and background may be requested by OWNER or ENGINEER before Notice of Award.

A. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

B. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

C. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

**Schedule of Information**

D. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

E. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

F. Subcontractor Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_  
Address: \_\_\_\_\_  
Item(s) of Work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
% of Contract Price: \_\_\_\_\_

## Schedule of Information

### 4. Working Hours

The following are the number of days per week, shifts per day, and hours per shift expected to be worked at the Site:

Number of hours per shift: \_\_\_\_\_  
Working Hours (hh:mm – hh:mm): \_\_\_\_\_  
Number of shifts per day: \_\_\_\_\_  
Number of days per week: \_\_\_\_\_

### 5. Permits

The following is a list of all permits required for completion of the Works and the estimated length of time necessary to obtain such permits after the date of Notice to Proceed.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

### 6. Key Personnel

The following are the names of the key personnel to be employed to direct the Works at the Site. Include resume of their qualifications and experience in Appendix 1:

Duty	Name	Resume of Previous Experience, Responsibilities, and Employers
Project Manager:	_____	(included in Appendix 1)
Superintendent:	_____	(included in Appendix 1)
Health and Safety Officer:	_____	(included in Appendix 1)
Other:	_____	(included in Appendix 1)

## Schedule of Information

### 7. Manpower Schedule

The following are the estimated number of manhours included in the Total Bid Price for each classification of worker proposed to be engaged on the Works each month at the Site:

**Estimated Number of Manhours by Trade**

Year	Month	Laborer	Operator	Subcontractor											Total Manhours per Month

## **Schedule of Prices**

With reference to Ib.15 of the Instructions to Bidders and other specified requirements, the following prices shall apply for the Works:

**Schedule of Prices**  
**Phase 2 MSW Area Closure**  
**Terrace Landfill**  
**Terrace, British Columbia**

Item No.	Item	Quantity	Units	Unit Cost	Total Cost
<b>01 30 00 - Administrative Requirements</b>					
01 30 00/1	Bonds	1	L.S.		
01 30 00/2	Insurance	1	L.S.		
01 30 00/3	Mobilization and Start-up	1	L.S.		
				Subtotal	
<b>01 35 29.13 - Health and Safety</b>					
01 35 29.13/1	Development, Implementation and Maintenance of HASP	1	L.S.		
				Subtotal	
<b>01 50 00 - Temporary Facilities and Controls</b>					
01 50 00/1	Erosion and Sediment Controls	1	L.S.		
01 50 00/2	Temporary Facilities and Controls	1	L.S.		
				Subtotal	
<b>01 70 00 - Execution and Closeout Requirements</b>					
01 70 00/1	Demobilization and Closeout	1	L.S.		
				Subtotal	
<b>02 56 13.16 - Geosynthetic Clay Liner</b>					
02 56 13.16/1	GCL for Final Cover	60,900	m2		
				Subtotal	
<b>02 66 13 - Landfill Gas Vents</b>					
02 66 13/1	Landfill Gas Vent Strips	503	L.m		
02 66 13/2	Landfill Gas Vent Riser Pipes	6	Ea		
				Subtotal	
<b>31 05 19.13 - Geotextiles for Earthwork</b>					
31 05 19.13/1	Non-woven Separation Geotextile	60,900	m2		
				Subtotal	
<b>31 10 00 - Site Clearing and Removals</b>					
31 10 00/1	Site Removals (Electric Fence, Gates), Protections, and Clearing/Grubbing	1	LS		
				Subtotal	
<b>31 23 16 - Excavation</b>					
31 23 16/1	Landfill Perimeter Ditches	560	L.m		
31 23 16/2	Landfill Mid-slope Swales (Berms)	660	L.m		
31 23 16/3	Landfill Letdown Ditches (Berms)	140			
31 23 16/4	Bypass Ditch (Leachate Treatment Area)	49	L.m		
				Subtotal	
<b>31 23 23 - Fill</b>					
31 23 23/1	Common Fill for Final Cover Subgrade	13,632	m3		
31 23 23/2	200 mm Thick Clear Crush Gravel Drainage Layer	60,900	m2		
31 23 23/3	300 mm Thick Landfill Access Road - Select 50 mm Minus	1,660	m2		
32 23 23/3	450 mm Thick Cover Fill (Excluding Mid-Slope and Letdown Ditch Berms)	60,900	m2		
				Subtotal	
				Subtotal	
<b>31 25 00 - Erosion and Sediment Controls</b>					
31 25 00/1	Flexamat Plus Channel Lining (15.5' / 4.7 m Width Roll)	171	L.m.		
				Subtotal	
<b>32 92 19 - Topsoil and Seeding</b>					
32 92 19/1	150 mm Thick Organic Layer and Hydroseeding	59,240	m2		
				Subtotal	
<b>33 00 00 - Pipes</b>					
33 00 00/1	600 mm Ø HDPE Profile Pipe Culvert	135	L.m		
33 00 00/2	900 mm Ø HDPE Profile Pipe Culvert	180	L.m		
				Subtotal	
<b>33 05 13 - Manholes</b>					
33 00 00/1	Inlet Manhole	1	Ea		
33 00 00/2	Energy Dissipator Manhole	1	Ea		
				Subtotal	
				Subtotal	
				<b>Total Excluding GST</b>	
				<b>5% GST</b>	
				<b>Total Including GST</b>	

END OF FORM OF BID



## **Appendix 1**

### **Statement of Qualifications**

Supply information including previous project names, descriptions, locations, clients with contact information, approximate values, and completion dates. Also include the resumes of the key personnel listed in Schedule of Information, paragraph 6.

**Appendix 2**

**Certificate of Insurance Availability**

I am an insurance broker/agent licensed in \_\_\_\_\_. I have reviewed the insurance provisions of CCDC 4 GC 11.1, Supplementary Condition GC11.1, and CCDC 41 of the bid documents entitled Phase 2 MSW Area Closure, Terrace Landfill, City of Terrace, Terrace, British Columbia on behalf of:

\_\_\_\_\_  
(Name of Bidder)

Based on my review of the insurance specifications of the above-mentioned bid documents, I certify that, except as specifically noted in an attachment to this certification, the insurance policies required by the bid documents are currently held or are available to the above named bidder and satisfy all of the insurance required by CCDC 4 GC 11.1, Supplementary Condition GC11.1, and CCDC 41 of the bid documents.

\_\_\_\_\_  
Date Signed

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Type or Print Name

\_\_\_\_\_  
Type or Print Title

\_\_\_\_\_  
Name of Company Submitting Form

Telephone No.: \_\_\_\_\_

**Appendix 3**

**Agreement to Bond**

To: \_\_\_\_\_  
(OWNER's Name and Address)

We have reviewed the Bid of \_\_\_\_\_  
(Bidder)

of \_\_\_\_\_  
(Address)

for \_\_\_\_\_  
\_\_\_\_\_  
(Contract Title, Name of Site, Location)

and wish to advise that should said Bid be accepted and the above named Bidder awarded a Contract, it is our present intention to become surety on the performance bond and payment bond required by the Contract.

We are duly authorized to do business in the Province of \_\_\_\_\_  
(where the Site is located)

Attest:  
\_\_\_\_\_  
\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Surety)

\_\_\_\_\_  
(Authorized Signature)

Attach Power of Attorney

(Corporate seal if any. If no seal, write "No Seal" across this place and sign.)

## **Appendix 4**

### **Proposed Progress Schedule**

**Appendix 5**

**Schedule of Additional Unit Prices**

## **Appendix 6**

### **Schedule of Personnel and Equipment Rental Rates**

# Technical Specifications

## SECTION 01 10 00

### SUMMARY

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Price and payment procedures.
  2. Description of the Project.
  3. Location.
  4. Access to the Site.
  5. Scope of work.
  6. Description of work.
  7. Sequence of work.
  8. Work by OWNER.
  9. Work performed on a Force Account Basis.
  10. OWNER-supplied products and materials.
  11. Contract Times.
  12. Drawings.
  13. CONTRACTOR use of the Site.
  14. Future work.
  15. OWNER occupancy.

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
1. No separate payment will be made for work of this Section.

##### 1.3 DESCRIPTION OF PROJECT

- A. Phase 2 MSW Closure, in Terrace, British Columbia (BC).

##### 1.4 LOCATION

- A. The Site is located at 555 Kalum Lake Road, Terrace, BC, approximately 5 km north of Terrace, BC.

##### 1.5 ACCESS TO THE SITE

- A. Access to the Site from Terrace, BC:
1. Head north on Kalum Lake Road for approximately 5 km.
  2. Turn left at the site entrance.
- B. Access to the Site: The site is not accessible to the public unless arranged with OWNER.



## 1.6 SCOPE OF WORK

- A. The Works to be performed under the Contract consists of the construction of Phase 2 MSW final cover, Phase 2 MSW gas venting and surface water management systems, and landfill perimeter surface water management system.

## 1.7 DESCRIPTION OF WORK

- A. The Works includes but is not limited to the following:
  1. Project startup including development of site staging and equipment storage plan and mobilization to the Site.
  2. Development, implementation, and maintenance of a Site-specific Health and Safety Plan in accordance with WorkSafeBC requirements.
  3. Provisioning and maintenance of temporary facilities and controls.
  4. Installation and maintenance of temporary erosion and sediment controls.
  5. Installation of protective fencing, barriers, and flags for overhead utility poles and monitoring wells.
  6. Site clearing and grubbing of limits of final cover area and loading, hauling, and placing vegetation at the borrow site for final restoration.
  7. Excavation, placing, and grading waste within the Phase 2 MSW footprint to establish subgrade for final cover installation and for excavation of perimeter ditches.
  8. Excavation, loading, hauling, and placing, and grading Common Fill excavated from the on-site borrow pit or stockpile near Site entrance, cleared vegetation, and Refuse from grading to establish subgrade for final cover installation.
  9. Finish grading, removal of stones, and installation of sand cushion layer (as required where stones cannot be removed) of subgrade in preparation for final cover installation.
  10. Supply and installation of landfill gas vent strips.
  11. Supply and installation of landfill gas vent riser pipe assembly.
  12. Supply and installation of Geosynthetic Clay Liner (GCL) on prepared subgrade.
  13. Excavation, screening, loading, hauling, and placing Clear Crush Gravel Drainage Layer.
  14. Supply and installation of Separation Geotextile layer.
  15. Excavation, loading, hauling, and placing, and grading Common Fill excavated from the on-site borrow pit for final cover (rooting zone and frost protection layer) and berms for mid-slope swales.
  16. Supply and placement of topsoil for final cover and ditches.
  17. Loading, hauling, placing, and compacting pit run for landfill access roads.
  18. Supply and installation of Flexamat channel lining for landfill letdown ditches.
  19. Supply and installation of culverts for access road crossings.
  20. Supply and installation of inlet and energy dissipator manholes.
  21. Tree felling, clearing, and grubbing (kept to minimum) for trenching for stormwater pipe (culvert).
  22. Supply and installation of stormwater pipe (culvert) for let down between inlet and energy dissipator manholes.
  23. Excavating and backfilling local soils or Common Fill from on-site borrow pit for construction of bypass ditch.
  24. Hydroseeding disturbed areas and final clean up and restoration.
  25. Demobilization and close out.

## 1.8 SEQUENCE OF WORK

- A. Perform the Works in stages to limit areas of disturbance and potential for erosion.

1.9 OWNER-SUPPLIED PRODUCTS AND MATERIALS

- A. Common Fill for grading and rooting zone layer in final cover.
- B. Borrow pit materials for screening sand bedding materials, Clear Crush Gravel and pit run.

1.10 CONTRACT TIMES

- A. Perform the Works according to the following Contract Times:
  - 1. The Works at the Site shall be commenced within 7 days after the date of the Notice to Proceed.
  - 2. The Works shall be substantially performed on or before September 30, 2023.
  - 3. The Works shall be fully completed and ready for final payment on or before October 31, 2023.

1.11 DRAWINGS

- A. Drawings issued with and forming part of the Contract Documents are listed below:

TITLE	DRAWING NO.	DATE	REVISION NO.	REVISION DATE
COVER AND DRAWING INDEX	GN-0001	3/4/2023	2	
EXISTING CONDITIONS	CI-0101	3/4/2023	2	
SITE PREPARATION PLAN	CI-0102	3/4/2023	2	
FINAL COVER GRADING PLAN - SUBGRADE	CI-0103	3/4/2023	2	
FINAL COVER GRADING PLAN - CUT/FILL TO SUBGRADE	CI-0104	3/4/2023	2	
SURFACE WATER MANAGEMENT	CI-0105	3/4/2023	2	
LANDFILL GAS VENTING SYSTEM	CI-0106	3/4/2023	2	
FINAL CONDITIONS	CI-0107	3/4/2023	2	
CROSS SECTION A-A' & B-B'	CI-0108	3/4/2023	2	
DETAILS I	CI-0501	3/4/2023	2	
DETAILS II	CI-0502	3/4/2023	2	
DETAILS III	CI-0503	3/4/2023	2	

- B. Perform the Works according to the Drawings issued "Approved for Construction" by ENGINEER. Such Drawings will be issued to CONTRACTOR with the Notice to Proceed and will consist of bid Drawings revised as required by ENGINEER and additional Drawings if required by ENGINEER.
- C. Revised "Approved for Construction" Drawings may be issued from time to time by ENGINEER and such Drawings will supersede previous revisions.

1.12 CONTRACTOR USE OF THE SITE

- A. Limit use of the Site to allow:
  - 1. OWNER occupancy.
  - 2. Work by OWNER.
  - 3. Use of the Site and premises by the public.

- B. Construction Operations: Limited to areas noted on the Drawings.
- C. When unfavourable weather, soil, drainage, or other unsuitable construction conditions exist, continue operations that will not be adversely affected by such conditions. Do not construct or cause to be constructed any portion of the Works under conditions that would adversely affect the quality of the Works, unless special means or precautions are taken to perform the Works in a proper and satisfactory manner.

#### 1.13 OWNER OCCUPANCY

- A. OWNER will occupy the Site during the entire period of construction.
- B. Cooperate with OWNER to minimize conflict, and to facilitate OWNER's operations.
- C. Schedule the Works to accommodate this requirement.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Price and payment procedures.
  2. Applications for Payment.
  3. Contract modification procedures.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
1. Payment for the Works will be made in lump sums and unit prices according to the Contract Documents.
  2. Measurement and payment requirements applicable to the Works are delineated in the individual Sections and complement the criteria of this article.
  3. CONTRACTOR shall be responsible for providing survey and measurement data throughout the duration of the Works, and for measurement and calculation of quantities for payment. ENGINEER will review and verify the data, measurements, calculations, and approve quantities for payment. Notify ENGINEER sufficiently in advance of operations to permit verification of measurements for payment, and provide necessary equipment, workers, facilities, and survey personnel for making measurements as required.
  4. Measurement for Unit Price Work: As specified in individual Sections. Quantities indicated in the Schedule of Prices are for bidding and contract purposes only and are approximate. Quantities of material furnished and/or work performed as provided by CONTRACTOR, accurately substantiated by CONTRACTOR's approved survey and measurement methods, and as verified and approved by ENGINEER, will be used to determine payment(s).
  5. Measurement for Lump Sum Work: ENGINEER will review and verify the amount of work eligible for progress payment purposes. Items will be measured in units such as time, weight, volume, area, or linear means, or combination as appropriate as a completed item or unit of the Works. Such measurements will serve as a basis for estimating percentage payments for partially completed work.
  6. Payment for Each Item Includes: Full compensation for furnishing labor, supervision, material, tools, equipment, plant, transportation, services, submittals, and incidentals for performance and completion of the Works in complete accordance with the Contract Documents; erection, application, installation, completion, or construction of an item of the Works; overhead and profit; and all other miscellaneous items for which separate payment is not provided under other Items of the Schedule of Prices. All work not specifically set forth as a separate pay Item in the Schedule of Prices shall be considered as a subsidiary obligation of CONTRACTOR and all costs in connection therewith shall be included in the amounts and prices stipulated in the Schedule of Prices. CONTRACTOR shall properly and fairly distribute indirect costs to each pay Item. Final payment for work governed by unit prices will be made on the basis of the actual measurements and quantities approved by ENGINEER multiplied by the unit price stipulated in the Schedule of Prices. Final payment for work governed by lump sum

prices will be made on the basis of the applicable lump sum prices stipulated in the Schedule of Prices.

7. Non-payment for Rejected Products: Payment will not be made for any of the following:
  - a. Products wasted or disposed of in a manner that is not acceptable.
  - b. Products determined as unacceptable before or after placement.
  - c. Products not completely unloaded from the transporting vehicle.
  - d. Products placed beyond the lines and levels of the required Works.
  - e. Products remaining on hand after completion of the Works.
  - f. Loading, hauling, and disposing of rejected products.

### 1.3 APPLICATIONS FOR PAYMENT

- A. Submit each Application for Payment electronically on the form approved by OWNER.
- B. Execute certification by signature of authorized officer. Application for Payment shall be certified by an authorized officer.
- C. List each authorized Change Order on the Application for Payment, listing Change Order number and dollar amount as for an original item of the Works.
- D. Prepare Application for Final Payment as specified in Section 01 70 00.
- E. Payment Period: Submit at a monthly interval stipulated in the Contract Documents.
- F. Submit releases and waivers as stipulated in the Contract Documents.
- G. When ENGINEER requires substantiating information, submit data justifying dollar amounts in question.

### 1.4 CONTRACT MODIFICATION PROCEDURES

- A. Changes in the Works or the requirement for extra work will be made by ENGINEER in accordance with the Contract Documents and with the change procedures as specified herein.
- B. Field Order: ENGINEER will advise of minor changes in the Works not involving an adjustment to the Contract Price or the Contract Times as authorized by the Contract Documents by issuing supplemental instructions in the form of a Field Order. Promptly execute such minor changes and supplemental instructions.
- C. Request for Quotation: ENGINEER may issue a Request for Quotation, which includes a detailed description of a proposed change with supplementary or revised information, Drawings, and Specifications, and schedule for executing the change in the Works. Prepare and submit a written itemized cost estimate of changes in the Contract Price and/or the Contract Times that would result from the proposed change in the Works by the due date stipulated in the Request for Quotation.
- D. Documentation of Change in Contract Price and Contract Times:
  1. Maintain detailed records of work done on a time and material or Force Account Basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Works.
  2. Document each quotation for a change in Contract Price and/or Contract Times with sufficient data to allow evaluation of the quotation by ENGINEER. Each quotation for a

- change must be approved by ENGINEER prior to CONTRACTOR proceeding with Works associated with the quotation. Allow sufficient time for ENGINEER to review the quotation, without adversely affecting efficiency or production of Works in progress.
3. On request, provide additional data to support computations including:
    - a. Quantities of products, labor, and equipment.
    - b. Taxes, insurance, and bonds.
    - c. Overhead and profit.
    - d. Justification for any change in the Contract Times.
    - e. Credit for deletions from the Contract, similarly documented.
  - E. Support each claim for additional costs, and for work done on a time and material or Force Account Basis, with additional information including:
    1. Origin and date of claim.
    2. Dates and times work was performed, and by whom.
    3. Time records and wage rates paid.
    4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
  - F. CONTRACTOR may propose a change by submitting a request for change to ENGINEER, describing the proposed change and its full effect on the Works, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Times with full documentation (including itemization of costs for labor, material, taxes, subcontracts, bonds, insurance, and overhead and profit) and a statement describing the effect on the Works by Other Contractors, if any.
  - G. Work Change Directive: ENGINEER may issue a document, signed by OWNER, instructing CONTRACTOR to proceed with a change in the Works, for subsequent inclusion in a Change Order. The document will describe changes in the Works, and will designate method of determining any change in the Contract Price or the Contract Times. Promptly execute the change in the Works.
  - H. Lump Sum Price Change Order: Based on Request for Quotation and CONTRACTOR's fixed lump sum price quotation or CONTRACTOR's request for a Change Order as approved by ENGINEER.
  - I. Unit Price Change Order: Based on Request for Quotation and CONTRACTOR's fixed unit price quotation and estimated quantities or CONTRACTOR's request for a Change Order as approved by ENGINEER.
  - J. Time and Material or Force Account Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Contract Documents. ENGINEER will determine the change allowable in the Contract Price and the Contract Times as provided in the Contract Documents. Maintain detailed records of work done on a time and material or Force Account Basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Works.
  - K. ENGINEER will issue Change Orders for signatures of parties as provided in the Contract Documents.
  - L. Promptly revise progress schedules to reflect any approved change in the Contract Times (or Milestones), revise sub-schedules to adjust times for other items of work affected by the change, and promptly resubmit to ENGINEER.
  - M. Promptly enter changes in the Project record documents.

- N. Promptly revise Applications for Payment to record each authorized Change Order as a separate line item and adjust the Contract Price.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

## SECTION 01 30 00

### ADMINISTRATIVE REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. Specification language.
  - 3. Mobilization and startup.
  - 4. Coordination.
  - 5. Pre-construction meeting.
  - 6. Progress meetings.
  - 7. Pre-installation meetings.

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 2. Bonds:
    - a. Schedule of Prices Item No. 01 30 00/1.
    - b. Payment Basis: Lump sum price. Includes furnishing and maintaining bonds required by the Contract Documents.
  - 3. Insurance:
    - a. Schedule of Prices Item No. 01 30 00/2.
    - b. Payment Basis: Lump sum price. Includes furnishing and maintaining insurance required by the Contract Documents.
  - 4. Mobilization and Startup:
    - a. Schedule of Prices Item No. 01 30 00/3.
    - b. Payment Basis: Lump sum price. Includes resource and material procurement activities; procure permits; equipment mobilization to site; meetings to coordinate key interface points and to establish communication channels between OWNER, ENGINEER, and CONTRACTOR.

##### 1.3 SPECIFICATION LANGUAGE

- A. These Project Specifications are written in imperative mood and are in abbreviated or streamlined form and include incomplete sentences. This imperative language is directed to CONTRACTOR, unless specifically noted otherwise. Omission of words or phrases such as "CONTRACTOR shall", "shall be", "a", "the", and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.



#### 1.4 MOBILIZATION AND STARTUP

- A. Do not mobilize to the Site without ENGINEER's prior written authorization. Ensure bonds and insurance as required by the Contract Documents are in full force.
- B. Perform planning and scheduling activities as necessary for the performance of the Works.
- C. Purchase materials and mobilize equipment, supplies, and incidentals to the Site.
- D. Use the existing Site access roads to the designated work areas during mobilization. Complete improvements to roads as necessary for the performance of the Works.
- E. Site temporary utilities and facilities in areas designated by ENGINEER. Obtain ENGINEER's approval prior to changing locations of temporary construction facilities. Do not use other areas without ENGINEER's prior approval. Provide additional land and access thereto not shown or described that may be required by CONTRACTOR for temporary construction facilities or storage of materials with no liability to OWNER or ENGINEER. Relocate construction equipment or other materials or equipment as required for the performance of the Works.
- F. Do not commence work involving contact with potentially contaminated materials until decontamination facilities are operational and approved by ENGINEER.

#### 1.5 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various Sections of the Project Specifications and other requirements of the Contract Documents to assure efficient and orderly sequence of the Works.
- B. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such elements.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on the Drawings. Follow routing shown for pipes, and conduit as closely as practicable; place runs parallel with line of structures. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and cleanup of work of separate Sections in preparation for Substantial Performance.
- F. After OWNER's occupancy of the Site or premises, coordinate access to the Site for correction of defective Works and Works not according to the Contract Documents, to minimize disruption of OWNER's activities.

#### 1.6 PRE-CONSTRUCTION MEETING

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

- B. ENGINEER will make arrangements for meeting, prepare agenda with copies for participants, and preside at meeting. Provide data required to ENGINEER and be prepared to discuss all items on the agenda.
- C. Minimum Attendance Required: CONTRACTOR, CONTRACTOR's Health and Safety Officer, and major Subcontractors.
- D. Agenda will include, but not necessarily be limited to, the following:
  - 1. Designation of responsible personnel.
  - 2. Lines of authority and communication.
  - 3. Health and safety.
  - 4. Use of the Site for storage, vehicle parking, access routes, and other Site requirements.
  - 5. OWNER's requirements.
  - 6. Coordination with Other Contractors and OWNER.
  - 7. Temporary facilities and controls provided by CONTRACTOR.
  - 8. Temporary utilities and services provided by OWNER.
  - 9. Field offices.
  - 10. Survey and layout.
  - 11. Security and housekeeping procedures.
  - 12. Procedures for processing field decisions, submittals, substitutions, applications for payments, proposal requests, Field Orders, Work Change Directives, Change Orders, and closeout procedures.
  - 13. Progress schedules.
  - 14. Procedures for testing and inspection.
  - 15. Procedures for maintaining Project record documents.
  - 16. Requirements for startup and commissioning of equipment.
  - 17. Inspection and acceptance of equipment put into service during construction period.
- E. ENGINEER will record minutes and distribute copies to participants and those affected by decisions made. Identify errors in the minutes, if any, to ENGINEER in writing within 3 days of receipt.

## 1.7 PROGRESS MEETINGS

- A. ENGINEER will schedule and administer progress meetings at the Site throughout the progress of the Works at minimum bi-weekly intervals or more frequently as required.
- B. ENGINEER will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings. Provide data required to ENGINEER and be prepared to discuss all items on the agenda.
- C. Attendance Required: CONTRACTOR's Health and Safety Officer, CONTRACTOR's superintendent, major Subcontractors and Suppliers, as appropriate to agenda topics for each meeting.
- D. Agenda will include, but not necessarily be limited to, the following:
  - 1. Review of minutes of previous meetings.
  - 2. Review of work progress since last meeting.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems which impede planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Review of off-Site material fabrication/processing and delivery schedules.
  - 7. Review of health and safety concerns and issues including air monitoring results.

8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Change Orders.
15. Applications for Payment.
16. Other business relating to the Works.

- E. Progress meetings attended by parties other than OWNER, ENGINEER, CONTRACTOR, and CONTRACTOR's major Subcontractors and Suppliers will be split into two meetings. Part A will include all parties at the meeting. Part B will include only OWNER, ENGINEER, CONTRACTOR, and CONTRACTOR's major Subcontractors and Suppliers, and will include discussions related to the Contract.
- F. ENGINEER will record minutes and distribute copies to participants and those affected by decisions made. All communication to Subcontractors, Suppliers, or others that CONTRACTOR is responsible for will be made through CONTRACTOR. Identify errors in the minutes, if any, to ENGINEER in writing within 3 days of receipt.

#### 1.8 PRE-INSTALLATION MEETINGS

- A. When required in individual Sections, convene a pre-installation meeting at the Site prior to commencing work of the Section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific Section.
- C. Notify ENGINEER, in writing, a minimum of 5 days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  1. Review conditions of installation, preparation, and installation procedures.
  2. Review coordination with related work.
- E. ENGINEER will record minutes and distribute copies to participants and those affected by decisions made.
- F. Identify errors in the minutes, if any, to ENGINEER in writing within 3 days of receipt.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 33 00  
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. Submittal procedures.
  - 3. Progress schedules.
  - 4. Shop Drawings.
  - 5. Product data.
  - 6. Manufacturer installation instructions.
  - 7. Manufacturer certificates.
  - 8. Project organization.
  - 9. Submittals for progress meetings.
  - 10. Site layout.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. No separate payment will be made for work of this Section.

1.3 SUBMITTAL PROCEDURES

- A. Submittal procedures shall conform to the requirements of the General Conditions, SHOP DRAWINGS AND SAMPLES, and procedures described in this article.
- B. Unless directed otherwise, transmit submittals to ENGINEER
- C. Transmit each submittal with ENGINEER accepted transmittal form and the correct number of copies.
- D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- E. Identify the Project, CONTRACTOR, Subcontractor, or Supplier; pertinent Drawing and detail number and Section number, as appropriate.
- F. Apply CONTRACTOR's approval stamp prior to initial submission to ENGINEER, signed and dated, certifying that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents including but not limited to review and approval, verification of products required, field dimensions, adjacent construction work, and coordination of information with respect to CONTRACTOR's review and approval of that submittal. Unstamped or unsigned submittals will be returned by ENGINEER without action.

- G. Except as specified otherwise, for each submittal for review by ENGINEER allow 15 days excluding delivery time to and from CONTRACTOR. Schedule submittals to expedite the Contract and according to specified scheduling. Coordinate submission of related items.
- H. Identify product or system limitations which may be detrimental to successful performance of the completed Works.
- I. Provide space for ENGINEER review stamp and comments on submittals.
- J. Make corrections to each submittal required by ENGINEER. Promptly revise and resubmit the required number of corrected copies of each submittal and submit new submittals required by such correction; identify changes made since previous submission and changes other than those requested by ENGINEER.
- K. Promptly distribute copies of reviewed submittals to Subcontractors, Suppliers, and other concerned parties as appropriate. Instruct parties to promptly report any inability to comply with provisions.
- L. Submittals not requested will not be recognized or processed. Submittals received directly from Subcontractors, Suppliers, vendors, or other Representatives or without CONTRACTOR stamp will be returned by ENGINEER without action.
- M. Adjustments made on CONTRACTOR's drawings by ENGINEER are not intended to change the Contract Price. If adjustments affect the Contract Price, state such in writing, as specified elsewhere in the Contract, to ENGINEER for approval prior to proceeding with the Works.
- N. It is the responsibility of CONTRACTOR to review submittals made by Suppliers and Subcontractors before transmitting them to ENGINEER to assure proper coordination of the Works and to determine that each submittal is according to CONTRACTOR's desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Drawings and Specifications. Incomplete or inadequate submittals will be returned for revision without review.
- O. Unless specified otherwise submit one electronic copy to ENGINEER as long as copy is legible in an electronic format, otherwise provide three hard copies of submittals.
- P. Requirements of this article shall apply to all required submittals.

#### 1.4 PROGRESS SCHEDULES

- A. Pursuant to the Contract Documents, within seven (7) days after the date of the Notice to Proceed and prior to commencing work at the Site, submit initial detailed progress schedule in duplicate, and one electronic copy in Microsoft Project Gantt Chart format. Submit updated progress schedules at each progress meeting, identifying changes since previous version and estimated percentage of completion for each item of the Works. If a schedule remains unchanged from one period to the next, submit a written notice to that effect.
- B. Submit a computer generated horizontal bar chart with separate line for each major section of the Works, identifying first work day of each week.
- C. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities, and include the Contract Times identified in

Section 01 10 00. Show coordination of interrelated work activities and items. Indicate the early and late start, early and late finish, float dates, and duration.

- D. Provide sub-schedules to define critical activities which dictate the rate of progress.
- E. Show accumulated percentage of completion of each item, and total percentage of the Works completed.
- F. Distribute copies of reviewed schedules to Subcontractors, Suppliers, and other concerned parties. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

## 1.5 SHOP DRAWINGS

- A. When specified in individual Sections, prepare detailed drawings of material and structures to be supplied by CONTRACTOR from typical details shown on "Approved for Construction" Drawings and/or from specified requirements.
- B. Indicate special utility and electrical characteristics.
- C. Indicate materials, methods of construction, attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of the Works.
- D. Where articles or equipment attach or connect to other articles or equipment, indicate that such work has been coordinated, regardless of the Section under which the adjacent items will be supplied and installed.
- E. Confirm dimensions shown on CONTRACTOR's drawings with actual measurements of existing and/or completed associated structures and affected adjacent work at the Site.
- F. Submit CONTRACTOR's drawings in accordance with SUBMITTAL PROCEDURES Article.
- G. After ENGINEER completes its review, Shop Drawings will be stamped with one of the following notations:
  - 1. Reviewed.
  - 2. Reviewed as Noted.
  - 3. Not Subject to Review.
  - 4. Revise and Resubmit.
- H. If a Shop Drawing is acceptable, it will be marked "Reviewed" or "Reviewed as Noted".
- I. Upon return of a Shop Drawing marked "Reviewed" or "Reviewed as Noted", CONTRACTOR may order, ship, or fabricate the materials included on the Shop Drawing, provided it is according to the corrections indicated. Upon receipt of Shop Drawings stamped "Reviewed" or "Reviewed as Noted", produce copies and distribute according to PART 1, SUBMITTAL PROCEDURES and for Project record document purposes as described in Section 01 70 00.
- J. If a Shop Drawing marked "Reviewed as Noted" has extensive corrections or corrections affecting other drawings or Works, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for Project record document purposes.

- K. Shop Drawings that are for information only will be marked "Not Subject to Review" and one copy will be returned to CONTRACTOR.
- L. If a Shop Drawing is unacceptable, two copies will be returned to CONTRACTOR marked "Revise and Resubmit".
- M. Upon return of a Shop Drawing marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure.
- N. Shop Drawings lacking adequate details or information to allow ENGINEER to determine whether or not the Shop Drawing meets the requirements of the Contract Documents will also be marked "Revise and Resubmit" and returned without further comment.
- O. Shop Drawings not bearing ENGINEER's "Reviewed" or "Reviewed as Noted" notation shall not be issued to Subcontractors nor utilized for construction purposes. No work requiring submission and approval of Shop Drawings shall be performed or equipment requiring submission and approval of Shop Drawings installed without Shop Drawings bearing one of these notations.
- P. Submit Shop Drawings well in advance of the need for the material or equipment for construction and with ample allowance for time required to make delivery of material or equipment after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. No materials or equipment shall be incorporated into the Works nor included in progress payments until approval thereof has been obtained in the specified manner.
- Q. ENGINEER will review and process all Shop Drawings promptly, but a reasonable time should be allowed for this, for Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to CONTRACTOR.
- R. Approval of Shop Drawings shall not relieve CONTRACTOR from the responsibility of furnishing materials and equipment of proper dimension, size, quality, quantity, and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Approval shall not relieve CONTRACTOR from responsibility for errors of any sort on Shop Drawings. Approval is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents. CONTRACTOR is responsible for information that pertains solely to the fabrication processes, to the technique of construction, and for the coordination of the work of all trades.
- S. CONTRACTOR shall not be relieved of any part of its responsibilities for correctness of its drawings or adequacy of its design bearing ENGINEER's "Reviewed" or "Reviewed as Noted" notation. ENGINEER's approval is for the sole purpose of ascertaining conformance with general design concepts, and in no way constitutes approval of the detail design inherent in CONTRACTOR's drawings, responsibility for which remains solely with CONTRACTOR. Drawings prepared by CONTRACTOR's representatives including Subcontractors, Suppliers, vendors, or other Representatives shall be considered CONTRACTOR's drawings.

#### 1.6 PRODUCT DATA

- A. Submit product data in accordance with SUBMITTAL PROCEDURES Article.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to the Project.

- C. Indicate product utility and electrical characteristics.
- D. After review, distribute according to PART 1, SUBMITTAL PROCEDURES and provide copies for Project record documents as described in Section 01 70 00.

#### 1.7 MANUFACTURER INSTALLATION INSTRUCTIONS

- A. When specified in individual Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, to ENGINEER in quantities specified for product data in SUBMITTAL PROCEDURES Article.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- C. Whenever the Specifications refer to manufacturer's instructions, such reference shall mean written instructions of the manufacturer.

#### 1.8 MANUFACTURER CERTIFICATES

- A. When specified in individual Sections, or when required by reference standards, submit certification and/or test results by manufacturer, in quantities specified for product data in SUBMITTAL PROCEDURES Article.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications, as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to ENGINEER.

#### 1.9 PROJECT ORGANIZATION

- A. Within seven (7) days after the date of the Notice to Proceed and prior to mobilization to the Site submit a Project organization chart identifying major positions and names of persons assigned to these positions, including off-Site project manager, superintendent, health and safety officer, testing labs, and Subcontractors.

#### 1.10 SUBMITTALS FOR PROGRESS MEETINGS

- A. At least 24 hours prior to scheduled progress meetings submit the following:
  - 1. Updated progress schedule detailing all activities. Include review of progress with respect to previously established dates for starting and stopping the various stages of the Works, major problems and action taken, injury reports, equipment breakdown, and material removal.
  - 2. Copies of environmental analytical results conducted by CONTRACTOR.
  - 3. Any other information required by ENGINEER or relevant to the agenda for the upcoming progress meeting.



#### 1.11 SITE LAYOUT

- A. Within seven (7) days after the date of the Notice to Proceed and prior to mobilization to the Site, submit Site layout drawings showing existing conditions, facilities, proposed construction facilities, and temporary controls to be provided by CONTRACTOR including, but not limited to, the following:
1. Existing property lines, structures, roads, utilities, and other existing Site feature or facility.
  2. Equipment and personnel decontamination areas.
  3. Equipment and material staging areas.
  4. Any other data deemed pertinent by CONTRACTOR or required by ENGINEER.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 35 29.14

HEALTH AND SAFETY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. References.
  - 3. General requirements.
  - 4. Basis of program.
  - 5. Site characterization.
  - 6. Submittals.
  - 7. Health and Safety Officer.
  - 8. Personnel health, safety, and hygiene.
  - 9. Air monitoring.
  - 10. Contingency and Emergency Response Plans.
  - 11. Site control.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 1. Development, Implementation, and Maintenance of the HASP:
    - a. Schedule of Prices Item No. 01 35 29.14/1.
    - b. Payment Basis: Lump sum price. Includes development, implementation, and maintenance of the HASP; provision of all required training and PPE; designation and maintenance of work areas; air monitoring for volatile organics, explosive gases, and respirable dust; provision of Emergency First-aid Facility; services of Health and Safety Officer.

1.3 REFERENCES

- A. Abbreviations and Acronyms:
  - 1. CPR: Cardiopulmonary resuscitation.
  - 2. FPAP Plan: Fall Protection and Prevention Plan.
  - 3. HASP: Site-specific Health and Safety Plan.
  - 4. MSDS: Material Safety Data Sheet.
  - 5. PPE: Personal protective equipment.
  - 6. WHMIS: Workplace Hazardous Materials Information System.
- B. Reference Standards:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for references.
  - 2. Province of British Columbia:
    - a. Workers Compensation Act, Occupational Health and Safety Regulation, includes amendments up to B.C. Reg. 230/2011, April 15, 2012.
    - b. WorkSafeBC guidelines and publications

#### 1.4 GENERAL REQUIREMENTS

- A. CONTRACTOR will act as Prime Contractor for the Works per the Workers Compensation Act.
- B. Comply with OWNER's safety procedures before beginning any construction activity on Site.
- C. CONTRACTOR will delineate their Prime Contractor Work area on a daily basis and post signage on the Site Office to present the delineated CONTRACTOR Work area. At each vehicular entrance to the Site area under the control of CONTRACTOR, erect a sign readable from a vehicle clearly identifying that CONTRACTOR is the Prime Contractor and visitors must check in with CONTRACTOR. CONTRACTOR will coordinate with landfill operations contractor for all access outside of this Area.
- D. Develop a written HASP prior to commencing mobilization to the Site and continue to implement, maintain, and enforce the HASP until final demobilization from the Site. The development, implementation, and maintenance of the HASP is CONTRACTOR's sole responsibility. As a minimum, the HASP shall address the requirements specified herein.
- E. The health and safety guidelines contained herein are minimal requirements intended to provide for a safe and minimal risk working environment for on-Site personnel and to minimize the impact of activities involving contact with Hazardous Substance, Hazardous Waste, Pollutant, Contaminant, or Solid Waste on the general public and the surrounding environment.
- F. Should CONTRACTOR seek relief from, or substitution for, any portion or provision of the health and safety requirements specified herein, or the HASP reviewed by ENGINEER, such relief or substitution shall be requested from ENGINEER in writing, and if accepted by ENGINEER, will be authorized in writing.
- G. Responsibility: Be responsible for the safety of persons and property on Site and for the protection of persons off Site and the environment to the extent that they may be affected by the conduct of the Works. Comply with (and enforce compliance by employees of CONTRACTOR and Representatives) safety requirements of the Contract Documents, Laws and Regulations, and the HASP. CONTRACTOR acknowledges that safety and environment protection obligations are of paramount importance regarding all of the work to be performed under the Contract Documents.
- H. Hazard Communication Requirements:
  - 1. Comply with Occupational Health and Safety Regulation, B.C. Reg., Part 5 - Chemical and Biological Substances, WHMIS.
  - 2. Provide ENGINEER with MSDS documentation on "hazardous" chemicals that CONTRACTOR or Representatives plan to bring onto the Site. In addition, CONTRACTOR shall be responsible for meeting container warning label requirements.
- I. Work Stoppage: Give precedence to the safety and health of the public and on-Site personnel and the protection of the environment over cost and schedule considerations for all Project work. The Health and Safety Officer shall be responsible for decisions regarding when the Works shall be stopped or started for health or safety considerations and shall have the authority, in the Health and Safety Officer's discretion, to stop or start the Works for health or safety considerations. ENGINEER will also have the right to stop the Works for health and safety considerations.

- J. Unforeseen Hazards: Should any unforeseen or Site-peculiar safety-related factor, hazard, or condition become evident during performance of the Works, bring such to the attention of ENGINEER verbally and in writing as quickly as possible, for resolution. In the interim, take prudent action to establish and maintain safe working conditions and to safeguard employees of CONTRACTOR and Representatives, the public, OWNER, ENGINEER, and the environment.

## 1.5 BASIS OF PROGRAM

- A. The basis of the Health and Safety Program has been adapted from the BC Occupational Health and Safety (OHS) regulations, as amended.

## 1.6 SITE CHARACTERIZATION

- A. Work at the Site will involve contact with municipal solid waste and may involve contact with leachate, landfill gas, and landfill gas condensate. Contact with landfill gases during completion of the work may occur with potential for flammable or explosive conditions present or trace gases that may be toxic or odorous. Contact with leachate and landfill gas condensate may have potential for biological contamination.
- B. Landfill Gas:
  - 1. Landfill gas will be present during excavations on the surface of the landfill. Landfill gases may be present in the soil adjacent to the landfill during excavation.
  - 2. Landfill gas results from the decomposition of refuse and is primarily composed of 40 to 65 percent methane, and 30 to 50 percent carbon dioxide, less than 2 percent nitrogen, less than 1 percent oxygen, and trace gases including mercaptans, hydrocarbons, solvents, water vapour, and hydrogen sulfide.
  - 3. Methane is explosive in concentrations between 5 and 15 percent by volume in air. Methane, carbon dioxide, and nitrogen are simple asphyxiants.
  - 4. Trace gases in landfill gas may be toxic and odorous (H<sub>2</sub>S). Odorous gases cause nausea in some persons. Toxic gases may also be present at concentrations above or below the levels deemed safe for human exposure; there is always a potential for levels to be sufficient to cause permanent and irreversible damage and even death.
- C. Waste must be considered prone to instability that may cause slope or sidewall failure due to the high void ratio, irregularity of material composing the waste, and a typically lesser degree of compaction than soil.

## 1.7 SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures: Requirements for submittals.
- B. HASP:
  - 1. Within 7 days after the date of the Notice to Proceed and prior to mobilization to the Site, submit a HASP. As a minimum, the HASP shall include the following:
    - a. A safety and health risk or hazard analysis for each work task and operation.
    - b. Personnel Training Requirements: The training shall cover the following:
      - 1) Names of personnel and alternates responsible for Site safety and health.
      - 2) Safety, health, and other hazards present on the Site.
      - 3) Use of PPE.
      - 4) Work practices by which personnel can minimize risks from hazards.

- 5) Safe use of engineering controls and equipment on the Site.
  - 6) Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards.
  - 7) Elements of the HASP.
  - c. A PPE program which shall address the following elements:
    - 1) Donning and doffing procedures.
    - 2) PPE selection based upon Site hazards.
    - 3) PPE use and limitations of the equipment.
    - 4) Work mission duration.
    - 5) PPE maintenance and storage.
    - 6) PPE decontamination and disposal.
    - 7) PPE training and proper fitting.
    - 8) PPE inspection procedures prior to, during, and after use.
    - 9) Evaluation of the effectiveness of the PPE program.
    - 10) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.
  - d. Medical surveillance requirements for personnel assigned to work at the Site.
  - e. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.
  - f. Site control measures to be employed at the Site. Site control measures shall include the following:
    - 1) Site map.
    - 2) Site work zones.
    - 3) Use of the "buddy system".
    - 4) Site communications including alerting means for emergencies.
    - 5) Standard operating procedures or safe work practices.
    - 6) Identification of the nearest medical assistance.
  - g. Decontamination procedures.
  - h. Emergency response requirements which will address the following:
    - 1) Pre-emergency planning.
    - 2) Personnel roles, lines of authority, and communication.
    - 3) Emergency recognition and prevention.
    - 4) Safe distances and places of refuge.
    - 5) Site security and control.
    - 6) Evacuation routes and procedures.
    - 7) Decontamination procedures which are not covered under the decontamination section.
    - 8) Emergency medical treatment and first aid.
    - 9) Emergency alerting and response procedures.
    - 10) Critique of response and follow-up.
    - 11) PPE and emergency equipment.
    - 12) Site topography, layout, and prevailing weather conditions.
    - 13) Procedures for reporting incidents to local, provincial, or federal agencies.
  - i. A written Respiratory Protection Program for Project activities.
2. ENGINEER will review the HASP and provide comments to CONTRACTOR within 7 days after receipt of the plan. Revise the plan as appropriate and resubmit the plan to ENGINEER within 10 days after receipt of comments from ENGINEER.
- C. Air Monitoring Reporting: Submit air monitoring results daily on a separate CONTRACTOR designated form.

## 1.8 HEALTH AND SAFETY OFFICER

- A. Employ and assign to the Works a competent and authorized representative herein referred to as "Health and Safety Officer".
- B. Health and Safety Officer Qualifications:
  - 1. Minimum of 2 years Site-related working experience specific to the activities associated with the Works.
  - 2. Basic working knowledge of provincial and federal occupational safety and health regulations.
  - 3. Formal education and/or training in occupational safety and health.
- C. Health and Safety Officer Responsibilities:
  - 1. Obligated to stop or start the work when it is necessary or advisable for reasons of health or safety.
  - 2. Conduct health and safety training sessions and ensuring that personnel not successfully completing the required training are not permitted to enter the Site to perform work in the Exclusion Zone or Contaminant Reduction Zone.
  - 3. Implementation and daily enforcement and monitoring of the HASP.
  - 4. Be on the Site during the execution of work at the Site
  - 5. Verify that all on-Site personnel are made aware of the provisions of the HASP and have been informed of the nature of physical and/or chemical hazards associated with Site activities.
  - 6. Maintain a daily log of all significant health and safety activities and incidents.
  - 7. Verify that on-Site personnel and visitors have received the required training, including instructions for safety equipment and PPE use.
  - 8. Suspend work if health and/or safety-related concerns arise.
  - 9. Provide on-Site technical assistance.
  - 10. Conduct the Site and personal air monitoring program, including all required real-time air monitoring and equipment maintenance and calibration.
  - 11. Issue/obtain required work permits.
  - 12. Conduct Site safety orientation training and daily safety meetings.
  - 13. Maintain the Exclusion Zone, Contaminant Reduction Zone, and restricted work areas.
  - 14. Coordinate emergency procedures.
  - 15. Conduct on-Site personnel safety indoctrination sessions for potential hazards, personal hygiene principles, confined space entry procedures, all other standard operating procedures, safety equipment usage, emergency procedures, and location of first aid kits and identification of personnel trained in first aid and CPR.
  - 16. Supervise and inspect equipment cleaning.
  - 17. Maintain the on-Site Hazard Communication Program including copies of all MSDSs.
  - 18. Verify that on-Site personnel have received the required physical examinations and medical certifications.
  - 19. Review Site activities with respect to the adequacy of the HASP.
  - 20. Maintain required health and safety documents and records on Site.

## 1.9 PERSONNEL HEALTH, SAFETY, AND HYGIENE

- A. Medical Surveillance:
  - 1. Conduct medical surveillance of personnel as required by specified regulations.
- B. Training: Furnish personnel assigned to or entering the Site with complete Site-specific training. Site-specific training shall ensure that personnel are capable of and familiar with the use of safety, health, respiratory, and protective equipment and with the safety and security

procedures required for the Site. The training session shall be completed by the Health and Safety Officer.

- C. Levels of Protection: Establish actual levels of protection for each work area based on planned activity and location of activity.
- D. PPE:
  - 1. Furnish on-Site CONTRACTOR personnel with appropriate PPE. Clean and maintain safety equipment and protective clothing. As a minimum, each worker on Site shall wear a hard hat, safety glasses with side shields, safety boots with steel toes and shank, full-length pants, and long sleeved shirt.
  - 2. Develop PPE usage procedures and enforce strict compliance with such procedures by on-Site personnel. Include the following procedures as a minimum:
    - a. Do not permit prescription eyeglasses to be worn that are not safety glasses. Do not permit contact lenses to be worn within the Exclusion Zone or Contaminant Reduction Zone.
    - b. Change respirator cartridges/filters daily during periods of respirator usage or prior to breakthrough, whichever occurs first.
    - c. Do not permit footwear to be worn that is not steel-toed safety shoes or boots. Require footwear to be covered by rubber overshoes when entering or working in the Exclusion Zone or Contaminant Reduction Zone.
    - d. Dispose of or decontaminate PPE worn on Site at the end of the work day.
    - e. Decontaminate reusable PPE before reissuing.
    - f. Do not permit on-Site personnel who have not passed a respirator fit test to enter the Exclusion Zone or Contaminant Reduction Zone. Do not permit personnel to have facial hair that interferes with a proper fit of the respirator.
- E. Respiratory Protection:
  - 1. Provide on-Site personnel with extensive training in the usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators according to Work Safe BC.
  - 2. Develop, implement, and maintain a written respiratory program.
  - 3. Monitor, evaluate, and provide respiratory protection for on-Site personnel.
  - 4. Levels of protection have been chosen to be consistent with the Site-specific potential airborne hazards associated with the major contaminants identified at the Site. The selection of appropriate protection is based upon the potential presence of compounds with the lowest recommended threshold limit value.
  - 5. Immediately notify ENGINEER when level of respiratory protection required increases from Level D to Level C or from Level C to Level B.
  - 6. Be responsible for appropriate respiratory protection during work activities. Do not allow persons to enter the Exclusion Zone or Contaminant Reduction Zone without appropriate respiratory protection.
  - 7. Be responsible for assessing the ability for on-Site personnel to wear respiratory protection. Cardiopulmonary system examination and pulmonary function testing are minimum requirements for personnel wearing respiratory protection.
  - 8. Do not permit on-Site personnel unable to pass a respirator fit test to wear respiratory protection and to enter the Exclusion Zone or Contaminant Reduction Zone.
- F. Heat Stress/Cold Stress: Implement a heat stress and/or cold stress monitoring program as applicable and include in the HASP.
- G. Personnel Hygiene and Personnel Decontamination Procedures:
  - 1. Provide, as a minimum, the following:

- a. Suitable disposable and reusable PPE on a daily basis for the use of CONTRACTOR's on-Site personnel.
  - b. Suitable containers for storage and disposal of used disposable PPE.
  - c. Potable water and a suitable sanitation facility.
- H. Emergency and First-aid Equipment:
1. Locate and maintain emergency and first-aid equipment in appropriate location on the Site.
  2. First-aid kit to accommodate the numbers of on-Site personnel.
  3. Portable emergency eye wash.
  4. Two 9 kg ABC type dry chemical fire extinguishers.
    - a. Blankets and towels.
    - b. Stretcher.
    - c. One hand-held emergency siren (air horn).
  5. As a minimum, provide one certified first-aid technician on Site at all times that on-Site work activities are in progress. This technician may perform other duties but shall be immediately available to render first aid when needed.
- I. Site Communications:
1. Post emergency numbers near Site telephones.
  2. Ensure that personnel work under the use of a "buddy" system and develop a hand signal system appropriate for Site activities.
  3. Provide an employee alarm system to notify employees of on-Site emergency situations or to stop work activities if necessary.
  4. Furnish selected personnel with two-way radios.
- J. Safety Meetings: Conduct mandatory daily safety meetings for on-Site personnel in the morning to discuss safety issues recapped from the day before, as well as health and safety issues for the current day, to address questions that may have arisen in the workforce, and additionally as required by special or work-related conditions. Include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new Site conditions as they are encountered. Hold additional safety meetings on an as-needed basis.

#### 1.10 AIR MONITORING

- A. Develop an air monitoring program meeting specified requirements.
- B. During the progress of work activities, monitor air quality in and around the Exclusion Zone. Conduct air monitoring on a regular periodic basis, and additionally as required by special or work-related conditions. Report any departures from general background to ENGINEER who will, in conjunction with the Health and Safety Officer, determine when operations should be shut down and restarted.
- C. Provide the required instruments for air monitoring including, as a minimum:
  1. All personnel must be trained and competent in the use of a gas detector capable of measuring combustible gas, toxic gas, and oxygen deficiency.
  2. Provide the required instruments for air monitoring including, as a minimum, an oxygen level meter, an H<sub>2</sub>S meter, and a combustible gas meter (LEL meter). Additionally, personal sampling pumps may be required if Site conditions warrant. Provide sufficient numbers of each instrument to monitor the active work location(s) and to provide backup equipment in cases of equipment malfunction.



- D. Multi-gas monitor that provides % Lower Explosive Limit, Hydrogen Sulphide, Oxygen, and Carbon Monoxide. Operate air monitoring equipment with personnel under the control of the Health and Safety Officer and who have been trained in the use of the specific equipment provided. Use intrinsically safe monitoring equipment within work areas potentially contaminated with combustible gases.
- E. Conduct air monitoring on a routine basis around active work locations. Perform monitoring as a minimum on an hourly basis and additionally as dictated by Site activities.
- F. Calibrate air monitoring equipment on a daily basis according to manufacturer's guidelines. Record calibrations in the Site daily logbook.
- G. Record wind speed and direction for all work where air monitoring is required.

H. Action Levels:

- 1. Combustible Gases: Action levels are based on the readings from a combustible gas meter. The readings are generally given as a percentage of the lower explosion limit (percent LEL) and are collected in the general work area. An atmospheric oxygen level of less than 19.5 percent may affect the readings from a combustible gas meter and give lower than actual levels. Test oxygen content first.

a. Non-confined Space Readings, General Area:

Instrument Reading	Action
0 to 10 percent LEL	Continue working and monitoring atmosphere for combustible gases. Inform personnel working in the area whenever readings greater than 5 percent LEL.
10 to 20 percent LEL	Continue working with caution. Inform personnel working in area of readings. Be prepared to cease operations.
Greater than 20 percent LEL	Cease operations and move to a safe place. Re-evaluate work plan. Engineering controls such as forced ventilation and use of non-sparking tools are to be implemented if operations are to continue. <b>DO NOT RESUME WORKING UNTIL CONDITIONS ARE CONSISTENTLY BELOW 20 PERCENT LEL.</b>

- b. Hot Work is only to be conducted at less than 0.1 percent LEL.
- c. The above noted trigger levels are to be monitored for the worker's breathing zone. The Site is presently venting landfill gas under variable pressure conditions. Within chambers and trenches, it is expected that levels well in excess of the triggers noted above will be encountered. The trigger levels apply for the worker's breathing zone, not within the chamber or trench unless these areas represent the worker's breathing zone.
- 2. Oxygen: A direct reading oxygen meter is used to determine the percent of oxygen in the atmosphere.

Instrument Reading	Action
Less than 19.5 percent or greater than 23.5 percent	Cease operations and move to a safe area. Re-evaluate work plan. Engineering controls such as forced ventilation are to be implemented if operations continue. <b>DO NOT RESUME WORKING UNTIL OXYGEN LEVELS ARE BETWEEN 19.5 AND 23.5 PERCENT.</b> When oxygen levels are outside this range, combustible

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|--|--|
|  | gas meter readings are not reliable. Supplied air or SCBA respiratory protection may be necessary. |
|--|--|
3. Hydrogen Sulfide (H<sub>2</sub>S): Whenever readings approach 10 ppm on a direct reading H<sub>2</sub>S meter, cease work immediately, move to a safe area and contact Health and Safety Officer. H<sub>2</sub>S has a Threshold Limit Value (TLV) level of 10 ppm.
- I. Reporting:
1. Report the results of air monitoring programs to ENGINEER daily. Include the following information as applicable:
    - a. Site location and date.
    - b. Work process and operation name.
    - c. Temperature, wind speed, and wind direction.
    - d. Area sampling location diagram.
    - e. Field notes, including the following:
      - 1) Description of operations and complaints and symptoms.
      - 2) Chemicals, materials, and equipment in use.
      - 3) Engineering and administration controls in effect.
      - 4) PPE in use.
      - 5) Sampling observations and comments.
  2. Record all daily air monitoring activities in a hard cover log book which shall be maintained on Site at all times by the Health and Safety Officer.

#### 1.11 CONTINGENCY AND EMERGENCY RESPONSE PLANS

- A. Contingency and Emergency Response Plans shall meet the specified requirements.
- B. On-Site Contingency and Emergency Response Plan: Address the standard operating procedures to be implemented during emergency situations.
- C. Include and address the following emergency situations and responses, as a minimum:
  1. In the event of injury to on-Site personnel or contact with hazardous materials requiring immediate medical attention, implement the following protocol:
    - a. Notify ENGINEER and the Health and Safety Officer.
    - b. Phone the hospital previously identified to be closest to the Site and describe the injury.
    - c. Decontaminate personnel and administer appropriate first aid.
    - d. Transport personnel to the specified hospital along the most direct route which shall be predefined prior to commencing work on the Site.
  2. In the event that a release of a hazardous waste occurs on Site beyond the limit of working areas, implement the protocols presented in the HASP. As a minimum, the response action shall consist of:
    - a. Notifying ENGINEER, authority having jurisdiction or an interest in the release including any conservation authority, water supply authorities, drainage authority, road authority, and fire department.
    - b. Performing material containment actions.
    - c. Performing air monitoring required to determine if the released material migrated off Site.
    - d. Performing required decontamination and/or disposal activities.
    - e. Creating an Incident Report, which will, as a minimum, discuss the incident and the response actions taken, present the findings from the investigation of the incident, and present protocols to prevent a reoccurrence of the situation.
  3. In the event that excessive gases or vapors are detected at a work area, take the following actions:

- a. Evacuate workers to an area upwind of the affected area.
- b. Identify the contaminant and monitor contaminant concentrations to determine the type of respiratory protection and/or engineering controls required before workers re-enter the area.
4. In the event of a fire at a work area, quickly use fire extinguishers and/or earth moving equipment to smother the fire if possible and, if the presence of noxious gases or degree of hazard prohibits this, employ proper evacuation procedures. Notify the Police and Fire Department. Police and Fire Department Officials will assume responsibility for coordinating with ENGINEER and the Health and Safety Officer for the proper emergency response strategy upon arrival.
5. In the highly unlikely event of a major leak of toxic gas, such as might occur if a compressed gas cylinder were encountered and ruptured, evacuate on-Site personnel to a safe distance, and notify the Police and Fire Department and local hospital if deemed necessary by ENGINEER and the Health and Safety Officer. Police and Fire Department Officials will assume responsibility for coordinating with ENGINEER and the Health and Safety Officer for the proper emergency response strategy upon arrival.

#### 1.12 SITE CONTROL

- A. Meet specified requirements.
- B. Confined Space Entry Program: Meet the requirements of:
  1. Workers Compensation Act, Occupational Health and Safety Regulation, B.C. Reg., Part 9 - Confined Spaces.
- C. Provide in the HASP:
  1. A figure or map which presents the delineation of the work zones for work activities.
  2. A discussion on Site security issues.
  3. A detailed discussion on decontamination procedures for both equipment and personnel, including collection and disposal of wash waters, sediments, and spent PPE.
  4. The hazards and controls associated with the use of scaffolds and ladders to perform work activities at the Site, including the use of various types of scaffolds including pole, tube and coupler, fabricated frame, horse, ladder jack, outrigger, interior hung, needle beam, suspended, adjustable suspended, and mobile. It also applies to the various types of ladders that may be used to perform work activities including step, extension, and fixed. Hazards that should be addressed include falls to different levels, being struck by falling objects, and exposure to unstable scaffolds and work platforms.
- D. Slip, Trip, and Fall Hazards: Maintain good housekeeping at the Site for the duration of the Works. Remove, mark, or guard trip hazards. Use extreme caution when working on or around slippery surfaces. Take all necessary precautions to protect personnel from injuries caused by slick surfaces.
- E. Fall Protection: Using guard rail systems, safety net systems, or personal fall arrest systems, protect walking or working horizontal and vertical surfaces at the Site with an unprotected side or edge that is 2 m or more above a lower level. Confined space workers and attendants shall wear and use fall arrest equipment according to manufacturer's instructions when there is a risk of falling:
  1. Two metres.
  2. Into operating machinery.
  3. Into water or another liquid.
  4. Onto a hazardous substance or object.
  5. Through an opening on a work surface.

- F. Work Areas: Clearly lay out and identify work areas in the field and limit equipment, operations, and personnel in the areas as defined below. Establish work areas as temporary or permanent, depending on the work activity and the sequence in which it is performed. These areas are:
1. Exclusion Zone: Includes areas where hazardous or potentially contaminated soils, debris, and other materials are being, or may be contacted, disturbed, or handled and areas where contaminated equipment or personnel travel. Establish temporary Exclusion Zones around remote work areas beyond the limits of the Exclusion Zone; clearly delineate temporary Exclusion Zones with temporary fencing and warning signs.
  2. Contaminant Reduction Zone: Occurs at the interface of the Exclusion Zone and Clean Zone and provides for the prevailing upwind transfer of construction materials from clean to Site-dedicated equipment, the decontamination of equipment and vehicles prior to entering the Clean Zone from the Exclusion Zone, the decontamination of personnel and clothing prior to entering the Clean Zone from the Exclusion Zone, and the physical segregation of Clean and Exclusion Zones.
  3. Clean Zone: Defined as a clearly delineated predominantly upwind area outside the Exclusion Zone(s) and Contaminant Reduction Zone(s), which functions include:
    - a. An entry area for personnel, material, and equipment to the Contaminant Reduction Zone.
    - b. An exit area for decontaminated personnel, material, and equipment from the Contaminant Reduction Zone.
    - c. A storage area for clean safety and work equipment.
- G. Contaminant Migration Control: Take appropriate measures to prevent contaminant tracking on and off Site. Decontaminate vehicles, equipment, and workers leaving areas of potential contamination prior to entry into Clean Zones. Locate decontamination facilities and sequence work activities to prevent contaminant tracking.

PART 2 PRODUCTS - Not Used

PART 3 GENERAL - Not Used

END OF SECTION

SECTION 01 40 00  
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. References.
  - 3. Quality control.
  - 4. Tolerances.
  - 5. Requirements for references.
  - 6. Inspecting company and testing laboratory services.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. No separate payment will be made for work of this Section.

1.3 REFERENCES

- A. Reference Standards:
  - 1. ASTM International:
    - a. ASTM C802 - Standard Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials.
    - b. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
    - c. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
    - d. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing.
  - 2. International Organization for Standardization:
    - a. ISO 9001 Quality Management Systems – Requirements

1.4 QUALITY CONTROL

- A. CONTRACTOR is solely responsible for establishing and implementing a quality control program to ensure that the Works is in accordance with the Contract Documents.
- B. Monitor quality control over Suppliers, products, services, Site conditions, and workmanship, to produce Works of specified quality.
- C. Comply with manufacturers' instructions, including each step in sequence.
- D. Should manufacturers' instructions conflict with the Contract Documents, request clarification from ENGINEER before proceeding.

- E. Comply with specified standards as minimum quality for the Works except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Perform work by persons qualified to produce workmanship of specified quality. Use persons licensed to perform the Works where required by these Specifications or Laws and Regulations.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- H. Materials furnished and finished or intermediate stages of the Works shall be sampled, tested, and inspected as specified in individual Sections and as required by reference standards.

#### 1.5 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Works. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with the Contract Documents, request clarification from ENGINEER before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

#### 1.6 REQUIREMENTS FOR REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable Laws and Regulations.
- B. Conform to reference standard by date of issue current as of bid closing date, except where a specific date is established by Laws or Regulations or by an individual Section.
- C. Specific provisions of Laws or Regulations may be referenced in the Project Specifications to assist CONTRACTOR and identify options selected by ENGINEER. Such references do not relieve CONTRACTOR from compliance with other applicable provisions of Laws or Regulations not specifically referenced.
- D. No inference or provision of any reference document including, but not limited to any standard specification, manual, or code shall be effective to change the relationships, duties, and responsibilities of OWNER, CONTRACTOR, or ENGINEER from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER or ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Works or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract.
- E. Reference standards referred to in these Specifications form part of the Specifications to the extent specified in individual Sections.
- F. In case of conflict or discrepancy between a reference standard and the Project Specifications or with another reference standard, the more stringent requirements shall apply.
- G. Should specified reference standards conflict with the Contract Documents, request clarification from ENGINEER before proceeding.

## 1.7 INSPECTING AND TESTING SERVICES

- A. CONTRACTOR shall employ and pay for services of an independent testing laboratory to perform inspecting and testing services as specified in individual Sections.
- B. Employment of testing laboratory and services performed by such testing laboratory in no way relieves CONTRACTOR of obligation to perform the Works according to requirements of the Contract Documents.
- C. Quality Assurance:
  - 1. Comply with requirements of the reference standards listed in PART 1.3, REFERENCES.
  - 2. Comply with agencies listed in individual Sections.
  - 3. Inspecting Company and Testing Laboratory: Authorized to operate in the province in which the Site is located.
- D. Testing Laboratory Responsibilities:
  - 1. Test samples of mixes and materials submitted by CONTRACTOR.
  - 2. Provide qualified personnel at the Site. Cooperate with ENGINEER and CONTRACTOR in performance of services.
  - 3. Perform specified inspecting, sampling, and testing of products and methods of construction according to specified standards.
  - 4. Ascertain compliance of materials and mixes with requirements of the Contract Documents.
  - 5. Promptly notify ENGINEER and CONTRACTOR of observed irregularities, deficiencies, or non-conformance of products.
  - 6. Perform additional inspection and tests required by ENGINEER.
  - 7. Attend pre-construction meetings and progress meetings, as required.
- E. Testing Laboratory Reports:
  - 1. After each inspection and test promptly submit electronic copies of reports to ENGINEER and CONTRACTOR. Submit draft on-Site inspection report prior to leaving the Site.
  - 2. As a minimum, reports shall include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name and address of testing laboratory.
    - d. Name of inspector.
    - e. Date and time of sampling or inspection.
    - f. Identification of product and related specification Section.
    - g. Location in the Project.
    - h. Record of temperature and weather.
    - i. Type of inspection or test.
    - j. Date of test.
    - k. Results of tests and observations.
    - l. Conformance with the Contract Documents.
  - 3. When requested by ENGINEER, provide interpretation of test results.
- F. CONTRACTOR Responsibilities:
  - 1. Deliver to testing laboratory at designated location, adequate samples of materials proposed to be used which require testing.
  - 2. Cooperate with personnel of independent testing laboratory and provide safe access to the Works and to manufacturer's operations.
  - 3. Provide incidental labor and facilities:
    - a. To provide access to the Works to be tested.
    - b. To obtain and handle samples at the Site or at source of products to be tested.
    - c. To facilitate tests and inspections.

4. Notify ENGINEER and testing laboratory 24 hours prior to expected time for operations requiring inspecting and testing services to allow for assignment of personnel and scheduling of tests.
5. Furnish copies of product test reports.
6. Promptly notify ENGINEER of all observed irregularities or non-conformance of the Works.
7. Retesting required because of CONTRACTOR negligence or non-conformance to specified requirements shall be performed by the same testing laboratory on instructions by ENGINEER at CONTRACTOR's expense and at no additional cost to OWNER.
8. If defects or deficiencies are revealed during testing or inspecting, correct such defects and deficiencies and retest affected portions of the Works.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION



SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. Temporary Utilities:
    - a. Electricity.
    - b. Water service.
    - c. Portable radios.
    - d. Construction lighting.
    - e. Temporary ventilation.
    - f. Fire protection.
  - 3. Construction Facilities:
    - a. CONTRACTOR's field office and sheds.
    - b. Equipment Decontamination Facility.
    - c. Personnel Hygiene/Decontamination Facility.
    - d. Emergency First-aid Facility.
    - e. Sanitary facilities.
    - f. Storage/stockpiling facilities.
    - g. Weigh Scale Facility.
  - 4. Vehicular Access and Parking:
    - a. Access roads.
    - b. Parking.
    - c. Traffic regulation.
  - 5. Temporary Barriers and Enclosures:
    - a. Barriers.
    - b. Fencing.
    - c. Security.
  - 6. Temporary Controls:
    - a. Water control.
    - b. Dewatering.
    - c. Erosion and sediment control.
    - d. Noise control.
    - e. Dust and particulate control.
    - f. Pollution control.
    - g. Equipment decontamination.
  - 7. Project identification.
  - 8. Removal of temporary facilities and controls.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 2. Erosion and Sediment Controls
    - a. Schedule of Prices Item No. 01 50 00/1.

- b. Payment Basis: Lump sum price. Includes supplying, installing, maintaining, and final removal of silt fence, straw bales, and other erosion and sediment control measures and items not paid for separately.
- 3. Temporary Facilities and Controls:
  - a. Schedule of Prices Item No. 01 50 00/2.
  - b. Payment Basis: Lump sum price. Includes supplying, installing, maintaining all temporary facilities and controls, site preparation, and items not paid for separately, final removal, and Site restoration. Includes temporary erosion controls for finished slopes and maintenance of slopes due to abnormal weather

### 1.3 REFERENCES

- A. Reference Standards:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for references.
  - 2. National Building Code Part 8 Safety Measures at Construction and Demolition Sites.
  - 3. National Fire Protection Association:
    - a. NFPA 10 - Standard for Portable Fire Extinguishers.
    - b. NFPA 70 - National Electrical Code.

### 1.4 TEMPORARY UTILITIES

- A. Electricity:
  - 1. Provide, maintain, and pay for temporary power service as required.
- B. Water Service:
  - 1. Provide, maintain, and pay for suitable quality water service required for construction operations.
- C. Two-way communication Radios:
  - 1. Equip at least the following key CONTRACTOR personnel with two-way portable radios:
    - a. Superintendent.
    - b. Health and Safety Officer.
    - c. Security personnel.
    - d. Each crew foreman.
- D. Construction Lighting:
  - 1. Provide as required for any night work.
- E. Temporary Ventilation:
  - 1. Ventilate enclosed areas to assist cure of materials, dissipate humidity, and prevent accumulation of dust, fumes, vapors, or gases.
- F. Fire Protection:
  - 1. Take precautions to prevent fires. Provide and maintain temporary fire protection equipment of a type appropriate to the hazard anticipated in accordance with Laws and Regulations and to the satisfaction of ENGINEER and insurance authorities.
  - 2. Bulk storage of flammable liquids and other hazardous materials is not allowed on Site. Handle flammable liquids in approved containers.
  - 3. Open burning of rubbish is not permitted on Site.
  - 4. Deliver, use, and dispose of flammable materials as required by authorities having jurisdiction.
  - 5. Prohibit smoking within the Landfill area. Designate an area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.

6. Establish a fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain the fire watch before, during, and after hazardous operations until threat of fire does not exist.
7. Provide portable Fire Extinguishers: 9 kg ABC type dry chemical.
8. Provide a minimum of one fire extinguisher in every construction trailer and storage shed.
9. Use fireproofed tarpaulins.
10. Comply with National Building Code, Part 8 and provincial and local regulations.
11. Include on-Site fire protection specified in CONTRACTOR's Site-specific Health and Safety Plan.

## 1.5 CONSTRUCTION FACILITIES

Do not use existing facilities for field offices or storage.

- A. CONTRACTOR's Field Office and Sheds:
  1. Provide CONTRACTOR's field office with the minimum facilities specified. Provide all required storage and work sheds.
  2. Field Office and Furnishings:
    - a. As required by CONTRACTOR and with sufficient room for Project meetings.
    - b. Exterior identifying sign.
    - c. Other furnishings at CONTRACTOR's option.
  3. Remove field office and sheds upon completion unless otherwise approved by ENGINEER.
- B. Equipment Decontamination Facility (not used)
- C. Personnel Hygiene/Decontamination Facility:
  1. Provide Personnel Hygiene which meets, as a minimum, the requirements of Section 01 35 29.14 Health and Safety.
- D. Emergency First-aid Facility:
  1. Provide, operate, and maintain an Emergency First-aid Facility containing, as a minimum, the equipment and supplies required by Section 01 35 29.14 Health and Safety.
- E. Sanitary Facilities:
  1. Provide and maintain required temporary sanitary facilities and enclosures.
  2. Remove and dispose of sanitary wastes off Site on a periodic basis as required and in accordance with applicable Laws and Regulations.
- F. Storage/Stockpiling Facilities:
  1. Provide, maintain, and operate storage/stockpiling facilities as required at the locations as shown on the drawings or as otherwise directed by ENGINEER / OWNER.
- G. Weigh Scale Facility:
  1. OWNER weigh scale may be used with permission from OWNER.

## 1.6 VEHICULAR ACCESS AND PARKING

- A. Access Roads:
  1. Existing Roads: Reasonable use of designated existing on-Site roads for construction traffic are permitted subject to the following conditions:

- a. Do not interrupt or interfere with traffic on roads at any time except where open-trench crossings are specified on the Drawings and proper notice regarding open-trench crossings has been given to ENGINEER.
  - b. Improve existing roads as CONTRACTOR may require to perform the Works.
  - c. Comply with weight and load size restrictions where applicable.
  - d. Tracked vehicles are not allowed on paved areas.
  2. Permanent Roads: Prior to Substantial Performance the base for permanent roads may be used for construction traffic. Avoid traffic loading beyond paving design capacity.
  3. Temporary Roads:
    - a. Locate roads as approved by ENGINEER. Obtain ENGINEER's prior approval for location and extent of temporary roads.
    - b. Construct temporary all-weather access roads from public thoroughfares and Site roadways to serve construction area of a width and load bearing capacity to provide unimpeded traffic for construction purposes as CONTRACTOR requires for performance of the Works.
    - c. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
    - d. Materials:
      - 1) Temporary Construction: CONTRACTOR's option.
      - 2) Permanent Construction: As specified in individual Sections.
    - e. Preparation: Clear areas, provide surface and storm drainage of road and adjacent areas.
    - f. Extend and relocate temporary roads as work progress requires. Provide detours as necessary for unimpeded traffic flow.
    - g. Provide unimpeded access for emergency vehicles. Maintain sufficient width and turning space.
    - h. Provide and maintain access to fire hydrants and control valves, free of obstructions.
  4. Maintenance and Use:
    - a. Maintain temporary access roads in a sound condition, properly graded, and free of ruts, washboard, potholes, ponding, ice, snow, mud, soft material, excavated material, construction equipment, and products. Maintain access roads throughout the Contract period to ensure unimpeded access for passenger automobiles as well as construction vehicles.
    - b. Maintain existing and permanent paved areas used for construction; promptly remove standing water and repair breaks, potholes, low areas, and other deficiencies, to maintain paving and drainage in original or specified condition.
    - c. Remove mud from vehicle wheels before entering public roads.
    - d. Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by ENGINEER; transport and place into designated area approved by ENGINEER. Clean access roads at least once per shift.
    - e. ENGINEER may collect soil samples for chemical analyses from the traveling surfaces of constructed and existing access routes prior to, during, and upon completion of the Works. Excavate and dispose of clean soil contaminated by CONTRACTOR's activities, and supply and place clean replacement soil materials, all at no additional cost to OWNER.
  5. Removal and Repair:
    - a. Remove temporary materials and construction at Substantial Performance.
    - b. Remove underground work and compacted materials to a depth of 0.6 m; fill and grade the Site as specified.
    - c. Repair permanent facilities damaged by use to original or specified condition.
- B. Parking:
1. Locate parking areas as approved by ENGINEER.
  2. Maintain separate parking area for construction equipment.

- C. Traffic Regulation:
  - 1. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.
  - 2. At approaches to the Site and on the Site, install traffic signs and signals at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
  - 3. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under CONTRACTOR's control, and areas affected by CONTRACTOR's operations.
  - 4. Relocate signs, signals, and devices as work progresses, to maintain effective traffic control.

## 1.7 TEMPORARY BARRIERS AND ENCLOSURES

- A. Barriers:
  - 1. Provide barriers to prevent unauthorized entry to construction, Site office, and on-Site parking areas, to allow for OWNER's use of the Site, and to protect existing facilities and adjacent properties from damage from CONTRACTOR's operations.
  - 2. Provide protection for plant life designated to remain. Replace damaged plant life.
  - 3. Protect vehicular traffic, stored materials, the Site, and structures from damage.
- B. Fencing:
  - 1. Construction: CONTRACTOR's option.
  - 2. Provide fencing to delineate work areas from public or operations.
  - 3. Enforce and require that workers and visitors observe and respect the limits marked with temporary fencing.
- C. Security:
  - 1. Provide security and facilities to protect the Works and the Site existing premises and facilities and OWNER's operations from unauthorized entry, vandalism, and theft.
  - 2. Restrict entrance of persons and vehicles into the Site.
  - 3. Allow entrance only to authorized persons with proper identification.
  - 4. Maintain log of workers and visitors and make available to ENGINEER on request. Include date, name, address, company employed by, company/person visited, time in and time out for each person, and record of deliveries and security incidents.
  - 5. OWNER will control entrance of persons and vehicles related to OWNER's operations.
  - 6. If unauthorized personnel are observed on the Site, notify ENGINEER and, if so directed by ENGINEER, call upon the appropriate law enforcement officials for proper legal actions.
  - 7. Do not permit visitors to enter the area secured by Site security fence without the express permission of the Health and Safety Officer and ENGINEER; require visitors to complete training in accordance with the Site-specific Health and Safety Plan prior to gaining access to the secured areas.
  - 8. Check that the perimeter fencing and warning signs are secure and intact on a daily basis; if deterioration of Site security fence is observed, or if warning signs are found to be removed, bring the situation to the attention of ENGINEER and immediately rectify.
  - 9. Keep access gate to the Site closed except for passage of authorized personnel and vehicles.

## 1.8 TEMPORARY CONTROLS

- A. Water Control:
  - 1. Maintain excavations free of water.

2. Protect the Site from puddling or running water. Grade the Site to drain. Provide water barriers as necessary to protect the Site from soil erosion.
  3. Prevent surface water runoff from leaving work areas.
  4. Do not discharge decontamination water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off Site or to municipal sewers.
  5. Prevent precipitation from infiltrating or from directly running off waste materials.
  6. Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.
  7. Dispose of water in a manner not injurious to public health or safety, to property, or to any part of the Works completed or under construction.
  8. Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.
  9. Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for the operation of the pumping equipment.
- B. Dewatering:
1. Dewater the various parts of the Works including, without limitation, excavations, structures, foundations, and work areas.
  2. Employ construction methods, plant, procedures, and precautions that will ensure the Works, including excavations, are stable, free from disturbance, and dry.
  3. Dewatering Methods: Includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and any other measures necessary to enable the whole of the Works to be carried out in the dry.
  4. Provide sufficient and appropriate labor, plant, and equipment necessary to keep the Works free of water including standby equipment necessary to ensure continuous operation of dewatering system.
  5. Take precautions necessary to prevent uplift of any structure or pipeline and protect excavations from flooding and damage due to surface runoff.
- C. Erosion and Sediment Control:
1. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent erosion and sedimentation.
  2. Minimize the amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, regrade, or otherwise develop in such a way as to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by ENGINEER.
  3. Provide ready means of temporary measures, as required based on abnormal weather conditions, which may include, but are not limited to, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and any other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off Site or to other areas of the Site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction.
  4. Hay or Straw Bale:
    - a. Wire bound or string tied.
    - b. Securely anchored by at least two stakes or rebars driven through the bale (300 mm to 450 mm) into the ground.
    - c. Chinked (filled by wedging) with hay or straw to prevent water from escaping between the bales.
    - d. Entrenched a minimum of (100 mm) into the ground.
  5. Silt Fence:

- a. An assembled, ready to install unit consisting of geotextile attached to driveable posts.
  - b. Geotextile: Uniform in texture and appearance having no defects, flaws, or tears that would affect its physical properties. Contain sufficient ultraviolet ray inhibitor and stabilizers to provide a minimum 2-year service life from outdoor exposure.
  - c. Net Backing: Industrial polypropylene mesh joined to the geotextile at both top and bottom with double stitching of heavy-duty cord.
    - 1) Minimum Width of Netting: (760 mm).
  - d. Posts: Sharpened wood approximately (50 mm) square protruding below the bottom of geotextile to allow a minimum of (450 mm) embedment.
    - 1) Post Spacing: Not to exceed 2.4 m.
    - 2) Securely fasten each post to the geotextile and net backing by staples suitable for such purpose.
6. Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In the event of damage, promptly take action to mitigate the effects of such damage. Restore affected bank or water body to its existing condition.
7. Installation:
- a. In the event of abnormal weather, construct temporary erosion control items as necessary to complete the works or if directed by OWNER or ENGINEER.
  - b. Do not construct bale barriers and silt fence in flowing streams or in swales where there is the possibility of a washout.
  - c. Check erosion and sediment control measures weekly and after each rainfall. During prolonged rainfall, check daily.
  - d. Bales and/or silt fence may be removed at the beginning of the work day, but shall be replaced at the end of the work day.
  - e. Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.
  - f. Prior to or during construction, ENGINEER may require installation or construction of improvements to prevent or correct temporary conditions on the Site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to the specific condition. Temporary improvements shall remain in place and in operation as necessary or until otherwise directed by ENGINEER.
  - g. Pay close attention to the repair of damaged bales, end runs, and undercutting beneath bales.
  - h. Unless otherwise shown on the Drawings or directed by ENGINEER, remove temporary erosion and sediment control devices upon completion of the Works. Spread accumulated sediments to form a suitable surface for seeding or dispose of and shape the area to permit natural drainage; all to the satisfaction of ENGINEER. Materials once removed become the property of CONTRACTOR.
8. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
9. Do not disturb existing embankments or embankment protection.
10. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
11. Unless specified otherwise, provide erosion and sediment control in accordance with Province of British Columbia regulations.
12. If soil and debris from the Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in ENGINEER's determination it is undesirable, remove the accumulation and restore the area to its original condition.

- D. Noise Control:
1. Provide methods, means, and facilities to minimize noise produced by construction operations.
  2. If machinery, motors, pumps, and other similar equipment must be operated beyond normal working hours, keep the noise below a level acceptable to ENGINEER by housing the equipment as necessary.
  3. Provide and use sufficient muffling devices that will minimize vehicle and equipment noise levels in the construction area.
- E. Dust and Particulate Control:
1. Execute the Works by methods to minimize raising dust from construction operations.
  2. Implement and maintain dust and particulate control measures as determined necessary by ENGINEER during construction and in accordance with Province of British Columbia regulations.
  3. Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for dust and particulate control.
  4. Do not use chemical means for a water misting system for dust and particulate control without ENGINEER's prior written approval.
  5. As a minimum, use appropriate covers on trucks hauling fine or dusty material and use watertight vehicles to haul wet materials.
  6. Prevent dust from becoming a nuisance to adjacent property owners or occupants.
  7. ENGINEER may stop work at any time when CONTRACTOR's control of dusts and particulates is inadequate for the wind conditions present at the Site, or when air quality monitoring indicates that the release of fugitive dusts and particulates into the atmosphere equals or exceeds the specified levels.
  8. In the event that CONTRACTOR's dust and particulate control is not sufficient for controlling dusts and particulates into the atmosphere, work shall be discontinued, and a meeting held between ENGINEER and CONTRACTOR to discuss the procedures that CONTRACTOR proposes to resolve the problem. Make all necessary changes to operations prior to resuming any excavation, handling, processing, or any other work that may cause a release of dusts or particulates.
- F. Pollution Control:
1. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
  2. Be prepared to intercept, clean up, and dispose of spills or releases that may occur, whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on Site.
  3. Promptly report spills and releases potentially causing damage to the environment to:
    - a. Authority having jurisdiction or an interest in the spill or release including any conservation authority, water supply authorities, drainage authority, road authority, and fire department.
    - b. The owner of the pollutant, if known.
    - c. The person having control over the pollutant, if known.
    - d. ENGINEER.
  4. Contact the manufacturer of the pollutant, if known, and ascertain the hazards involved, precautions required, and best measures to be used in any cleanup or mitigating action.
  5. Take immediate action using available resources to contain and mitigate the effects on the environment and persons from any spill or release.
- G. Equipment Decontamination:
1. Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.
  2. Perform equipment decontamination on CONTRACTOR-constructed equipment decontamination pad.



3. As a minimum, perform the following steps during equipment decontamination:
  - a. Mechanically remove packed dirt, grit, and debris by scraping and brushing without the use of steam or high-pressure water to reduce the amount of water needed and to reduce the amount of contaminated rinsate generated.
  - b. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by ENGINEER.
  - c. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages.
  - d. Scrub surfaces with long handle scrub brushes and a cleaning agent.
  - e. Rinse off and collect cleaning agent.
  - f. Air dry equipment in the Clean Zone before removing from the Site or travel on clean areas.
  - g. Perform an assessment as directed by ENGINEER to determine the effectiveness of the decontamination.
4. Each piece of equipment will be inspected by ENGINEER after decontamination and prior to removal from the Site and/or travel on clean areas. ENGINEER will have right to require additional decontamination to be completed if deemed necessary.
5. Take appropriate measures necessary to minimize the drift of mist and spray during decontamination including the provision of wind screens.
6. Collect decontamination wastewaters and sediments which accumulate on the equipment decontamination pad. Transfer wastewaters to designated wastewater storage tank.
7. Transfer sediments to landfill area or location designated by ENGINEER.
8. Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.
9. Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for the operation of the pumping equipment. Maintain piping and connections in good condition and leak-free.

1.9 PROJECT IDENTIFICATION

- A. Provide Project sign of exterior grade plywood and wood frame construction, painted, with die cut vinyl, self-adhesive letters and self-adhesive corporate logo, to ENGINEER's design and colors.
- B. List title of the Project, names of OWNER, ENGINEER, CONTRACTOR.
- C. Erect on the Site at location established by ENGINEER.
- D. No other signs are allowed without OWNER's prior written permission except those required by law.

1.10 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Performance inspection.
- B. Remove underground installations.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original and functional or specified condition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 60 00  
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Price and payment procedures.
  - 2. Basic product requirements.
  - 3. Product options.
  - 4. Product substitutions.
  - 5. Product delivery and handling requirements.
  - 6. Product storage and handling requirements.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. No separate payment will be made for work of this Section.

1.3 BASIC PRODUCT REQUIREMENTS

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacturer for components being replaced.

1.4 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any approved product meeting those standards or descriptions.
- B. Products Specified by Naming One or More Manufacturers With a Provision Not Prohibiting Substitutions: Products of manufacturers named and meeting specifications; options or substitutions allowed in accordance with the General Conditions, SUBSTITUTES AND OR-EQUALS. Submit a request for substitution for any manufacturer not named in accordance with the following article.
- C. Products Specified by Naming One or More Manufacturers With a Provision Prohibiting Substitutions: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

1.5 PRODUCT SUBSTITUTIONS

- A. The Contract Documents specifies requirements and procedures for submitting requests for substitutions after the Notice of Award.

- 
- B. Document each request with complete data substantiating compliance of proposed substitution with the Contract Documents.
  - C. A request for substitution constitutes a representation that CONTRACTOR:
    - 1. Has investigated the proposed product and determined that it meets or exceeds the quality level of the specified product.
    - 2. Will provide the same warranty for the substitution as for the specified product.
    - 3. Will coordinate installation and make changes to other Works which may be required for the Works to be complete at CONTRACTOR's expense and at no additional cost to OWNER.
    - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
    - 5. Will reimburse OWNER for review or redesign services associated with re-approval by authorities.
  - D. Substitutions will not be considered when they are shown or implied on Shop Drawings or product data submittals without separate written request.
  - E. Substitution Submittal Procedure after the Notice of Award:
    - 1. Submit one electronic copy of request for substitution for consideration. Limit each request to one proposed substitution.
    - 2. Submit Shop Drawings, product data, and certified test results and other data as required by the General Conditions, SUBSTITUTES AND OR-EQUALS, attesting to the proposed product equivalence. Burden of proof is on CONTRACTOR.
    - 3. ENGINEER will notify CONTRACTOR in writing of decision to accept or reject request.
    - 4. ENGINEER will be sole judge as to the acceptance or rejection of CONTRACTOR's request.
    - 5. In the event CONTRACTOR obtains ENGINEER's approval for the use of products other than that shown or specified, CONTRACTOR shall, at CONTRACTOR's own expense and using methods approved by ENGINEER, make all changes to the Works, including structures, piping, electrical, equipment, and controls, that may be necessary to accommodate this product.

## 1.6 PRODUCT DELIVERY AND HANDLING REQUIREMENTS

- A. Make all arrangements for transportation, delivery, and handling of products required for prosecution and completion of the Works.
- B. Shipments of products to CONTRACTOR or Subcontractors shall be delivered to the Site only during regular working hours. Shipments shall be addressed and consigned to the proper party giving name of Project, street number, and city. Do not deliver shipments to OWNER except where otherwise directed in writing.
- C. Provide advance notice of delivery of products to the Site as required in other Sections. Do not deliver products of any kind to the Site until approval in writing has been applied for and obtained by CONTRACTOR from ENGINEER.
- D. Arrange delivery of products to the Site in accordance with work sequence and in ample time to facilitate inspection prior to installation. Schedule deliveries to limit requirement for storage at the Site to the practical minimum.
- E. Coordinate deliveries to avoid conflict with the Works and conditions at the Site and to accommodate the following:

1. Work of Other Contractors, or OWNER.
  2. Limitations of storage space.
  3. Availability of equipment and personnel for handling products.
  4. OWNER's use of the Site.
- F. Do not have products delivered to the Site until related Shop Drawings or Samples have been approved by ENGINEER.
- G. Do not have products delivered to the Site until required storage facilities have been provided.
- H. Transport and handle products in accordance with manufacturers' instructions.
- I. Immediately on delivery, inspect shipments to ensure that products comply with requirements of the Contract Documents and reviewed submittals, quantities are correct, and products are undamaged.
- J. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

#### 1.7 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Limit on-Site storage of products to areas shown on the Drawings or otherwise approved by ENGINEER.
- B. Make all arrangements and provisions necessary for storage of materials and equipment.
- C. Place all excavated materials, construction equipment, and materials and equipment to be incorporated into the Works so as not to injure any part of the Works or existing facilities and so that free access can be had at all times to all parts of the Works and to all utility service company installations in the vicinity of the Works.
- D. Store and protect products in accordance with manufacturers' recommendations and instructions and requirements of Specifications, with seals and labels intact and legible.
- E. Store sensitive products in weathertight, climate-controlled enclosures. Protect products subject to ultraviolet degradation from direct exposure to sunlight.
- F. For exterior storage of fabricated products, place on sloped supports, above ground.
- G. Provide off-Site storage and protection when the Site does not permit on-Site storage or protection.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of product.
- I. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- J. Furnish equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit easy access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

- 
- L. Store materials and equipment neatly and compactly, and in locations that will cause a minimum of inconvenience to Other Contractors, public travel, adjoining owners, tenants, and occupants.
  - M. Protect delivered products from contamination or damage.
  - N. Do not use lawns, grass plots, or other private property for storage purposes without written permission of OWNER or other person in possession or control of such premises.
  - O. CONTRACTOR shall be fully responsible for loss or damage to stored products, materials, and equipment.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

## SECTION 01 70 00

### EXECUTION AND CLOSEOUT REQUIREMENTS

#### 1.1 SUMMARY

- A. Section Includes:
1. Price and payment procedures.
  2. Examination.
  3. Preparation.
  4. Field surveying.
  5. Cutting and patching.
  6. Restoration.
  7. Alteration Project procedures.
  8. Progress cleaning.
  9. Final cleaning.
  10. Final decontamination.
  11. Removal and disposal.
  12. Starting and adjusting.
  13. Protection of installed work.
  14. Closeout procedures.
  15. Project record documents.
  16. Spare parts, maintenance materials, and extra materials.
  17. Operation and maintenance data.
  18. Warranties.

#### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  2. Demobilization and Closeout:
    - a. Schedule of Prices Item No. 01 70 00/1.
    - b. Payment Basis: Lump sum price. Includes final decontamination of equipment, temporary demobilization of equipment construction facilities, and materials to be removed from the Site; final removal of temporary construction and support facilities provided by CONTRACTOR; final Site cleanup; final non-contaminated waste removal and disposal; final grading; adjusting; field surveying; cutting and patching; restoration; protection of installed work; Project record documents; operation and maintenance data; warranties; and furnishing spare parts, maintenance materials, and extra materials.

#### 1.3 REFERENCES

- A. Abbreviations and Acronyms:
1. Section 01 40 00 - Quality Requirements: Requirements for references.
  2. Occupational Health and Safety Act (OHSA).

#### 1.4 EXAMINATION

- A. Prior to commencement of work at the Site, inspect the Site with ENGINEER to review and establish the condition of surface features including existing roads, parking areas, buildings, wells, trees and other plants, grassed areas, fencing, service poles, wires, paving, and survey bench marks or monuments on or adjacent to the Site which may be affected by the Works. This inventory shall be mutually agreed between ENGINEER and CONTRACTOR and shall not thereafter be subject to dispute. Such inventory, as may be amended from time to time, will be used by ENGINEER to check compliance by CONTRACTOR with the requirements of the Contract Documents.
- B. Provide ongoing review, inspection, and attendance during performance of the Works to properly document conditions. Promptly inform ENGINEER of any existing condition at the Site affected by the Works which may require restoration, repair, or replacement. Do not cover up any of the Works without prior approval from ENGINEER.
- C. Maintain and protect existing Site structures and facilities from damage which may be affected by the Works while work is in progress. Repair or replace damage resulting from the Works to ENGINEER's approval.
- D. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance by CONTRACTOR of existing conditions.
- E. Verify that existing substrate is capable of structural attachment of new work being applied or attached or that existing or previously constructed surfaces are ready to receive subsequent work.
- F. Examine and verify specific conditions described in individual Sections.
- G. Verify that utility services are available, of the correct characteristics, and in the correct location.
- H. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities.
- I. Prior to commencing construction activities at the Site, conduct a detailed Site topographic survey and provide completed survey, including point (csv) files, surface (xml) files, AutoCAD (dwg) files, and PDF files to ENGINEER. This survey shall be mutually agreed between ENGINEER and CONTRACTOR and shall not thereafter be subject to dispute. Beginning the Works means acceptance by CONTRACTOR of existing conditions.

#### 1.5 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.



## 1.6 FIELD SURVEYING

### A. Quality Assurance:

1. CONTRACTOR's registered land surveyor shall complete pre-construction, in progress, final grade, and as-built topographic surveys and other survey activities necessary for design verification, quantity calculations, and Applications for Payment. CONTRACTOR shall submit in progress survey information to ENGINEER as back up with progress payments.
2. If initial and subsequent surveys are in whole or in part performed by means of GPS equipped construction equipment, perform supplemental control surveys approved by ENGINEER.
3. ENGINEER may, at any time, check CONTRACTOR's survey and layout work but this shall not relieve CONTRACTOR of any of its responsibilities to carry out the Works to the lines and grades set out according to the Drawings and the Project Specifications or as otherwise necessary for performance of the Works according to the Contract Documents.
4. Notify ENGINEER in writing at least 5 working days in advance of commencing work on any part of the construction to enable ENGINEER to establish bench marks and base lines.
5. Unless otherwise specified, ENGINEER will establish reference bench marks and base lines adjacent to the Works. CONTRACTOR shall be responsible for laying out the Works from established reference points.

### B. Submittals:

1. Submit paper and digital copies of Site drawing and certificate signed by the land surveyor engaged by CONTRACTOR that the elevations and locations of the Works are in conformance with the Contract Documents. Information shall include surface (xml) files, point files, CAD drawings, and PDF figures. Provide digital copy, on USB memory stick or electronic file transfer or Compact Disc (CD) compatible for use with Windows 7, 64 bit and AutoCAD Civil3D (2020 or higher).
2. The final survey report shall include the following information:
  - a. The existing control monuments used in the transfer.
  - b. An explanation of how adjustments were performed.
  - c. A printout of the initial analysis worksheet.
  - d. A listing of map projection transformation.
  - e. A listing of loop closures.
  - f. Location sketches and descriptions of all azimuth control pairs on control data sheets to include their X, Y, Z coordinate values, scale factor, and GEOID separation.
  - g. Vector map.
  - h. A spreadsheet with all Project data.
3. On request, submit documentation verifying accuracy of survey work.

### C. Record Documents:

1. Maintain a complete and accurate log of control and survey work as it progresses.
2. Prepare a survey illustrating dimensions, locations, angles, and elevations of construction, and Site work.
3. Submit record documents under the provisions of PART 1, PROJECT RECORD DOCUMENTS.

### D. Survey Reference Points:

1. Locate, preserve, and protect survey control and reference points.
2. Control datum for survey is that established by OWNER.
3. Promptly report to ENGINEER the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

4. Make good any errors entering into the Works through CONTRACTOR failure to notify ENGINEER concerning lack of preservation of such survey reference points.
5. Accurately replace or relocate disturbed reference or survey control points based on original survey control. Make no changes without prior written notice to and approval from ENGINEER.

E. Survey Requirements:

1. Utilize recognized engineering survey practices. Locate and lay out the Works using properly calibrated instrumentation.
2. Establish elevations, lines, and levels.
3. Periodically verify layouts by same means and methods.
4. Establish a minimum of two temporary bench marks on Site, referenced to established control points. Record locations, with horizontal and vertical data, on Project record documents.
5. Provide reasonable and necessary opportunities and facilities for setting points and making measurements during construction.
6. Confirm and document locations of all utilities.
7. Develop and make such additional detailed surveys as are needed for construction, such as bench marks, slope stakes, batterboards, stakes for establishing the design elevations of excavations and final grades, as-builts, and other working points, lines, and elevations. Maintain bench marks and base lines established by ENGINEER, existing property boundaries, lines and grade hubs, and other references and construction or survey points.
8. Post-processing software must be capable of producing relative position coordinates and corresponding statistics which can be used in a three dimensional least squares network adjustment. This software should also allow analysis of loop closures and repeat baseline observations.

F. Examination:

1. Verify locations of survey control points prior to starting work.
2. Verify set-backs, easements, and clearances, confirm Drawing dimensions and elevations.
3. Promptly notify ENGINEER of any discrepancies discovered.

## 1.7 CUTTING AND PATCHING

A. Employ skilled and experienced installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affects:

1. Structural integrity of element.
2. Integrity of weather exposed or moisture resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight exposed elements.
5. Work of OWNER or Other Contractors.

C. Include in request:

1. Location and description of the affected Works.
2. Necessity for cutting or alteration.
3. Description of proposed work and products to be used including materials, methods, and procedures.
4. Alternatives to cutting and patching.
5. Effect on work of OWNER or Other Contractors.
6. Written permission of affected Other Contractors.

7. Date and time work will be executed.
- D. Execute cutting, fitting, and patching, including excavation and fill, to complete the Works, and to:
  1. Fit the several parts together, to integrate with other work.
  2. Uncover work to install or correct ill-timed work.
  3. Remove and replace defective or nonconforming work.
  4. Remove samples of installed work for testing.
  5. Provide openings in elements of work for penetrations of mechanical and electrical work.
- E. Execute work by methods to avoid damage to other Works, and which will provide proper surfaces to receive patching and finishing.
- F. Provide temporary supports to ensure structural integrity of the Works. Provide devices and methods to protect other portions of the Project from damage.
- G. Provide protection from weather and the elements for areas which may be exposed by uncovering work.
- H. Restore work according to the requirements of the Contract Documents.
- I. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. Identify any hazardous substance or condition exposed during performance of the Works to ENGINEER for decision or remedy.
- K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

## 1.8 RESTORATION

- A. As a minimum, restoration shall mean replacement, repairs, or reconstruction to a condition at least as good as or better than the condition prior to commencement of the Works.
- B. Except where specifically required otherwise by other Sections, restore areas of the Works and areas affected by the performance of the Works to conditions that existed prior to commencement of the Works and to match condition of similar adjacent, undisturbed areas.
- C. Ensure that restored areas match existing grade and surface drainage characteristics, except as otherwise specified, and ensure a smooth transition from restored surfaces to existing surfaces.
- D. Do not alter original conditions without prior written approval from ENGINEER.
- E. Without limiting the generality of the foregoing or other requirements of the Contract Documents, preserve and protect existing features encountered at the Site during performance of the Works including, but not limited to buildings, wells, structures, curbs and gutters, fences, manholes and catch basins, utilities, railroad sidings, roads, streets, walks, grassed areas, and other graded or improved areas.
- F. Utilize construction methods and procedures during performance of the Works which keeps disturbance and damage of whatever nature to existing conditions to the practical minimum.

Where work necessitates root or branch cutting, do not proceed without ENGINEER's prior approval.

- G. Ensure that quality, grades, elevations, and the extent of bedding, cover, and other backfill materials including subgrades, and finish grades for roadways and parking areas are properly documented during their removal to ensure reconstruction to at least their original and functional condition.
- H. Restoration Material: New, except as otherwise specified, not damaged or defective, and of the best quality for the purpose intended. Furnish evidence as to type, source, and quality of materials or products furnished when requested by ENGINEER or specified in other Sections.
- I. Should any dispute arise as to the quality or fitness of materials, whether obtained on or off Site, whether previously inspected by ENGINEER prior to use or not, the decision to use any material or product in the finished Works will rest solely with ENGINEER.
- J. Remove from the Site clean material not approved for reuse.
- K. Handle and store products and materials in a manner to prevent damage, adulteration, deterioration, and soiling and according to manufacturers' instructions when applicable.
- L. Prior to commencement of restoration work, inform ENGINEER of proposed material, methods, and procedures to repair, replace, or reconstruct disturbed, damaged, or suspected damage to the Works.
- M. Perform cutting, fitting, remedial, and coordination work to make the several parts of the Works fit together.
- N. Except as specified otherwise, dismantle and salvage materials for reuse where practicable. Exercise due care when removing material for salvage. Repair or replace materials damaged through improper handling or through loss after removal.
- O. Store and protect removed material approved for reuse in approved locations. Beginning of restoration work means acceptance of existing conditions.

#### 1.9 ALTERATION PROJECT PROCEDURES

- A. Products for Patching and Extending Works:
  - 1. New Materials: As specified in Sections; match existing products and work for patching and extending work.
  - 2. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing Works as a standard.
- B. Examination:
  - 1. Verify that demolition is complete and areas are ready for installation of new Works.
  - 2. Beginning of restoration work means acceptance of existing conditions.
- C. Preparation:
  - 1. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.
  - 2. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Works.

3. Remove debris and abandoned items from area and from concealed spaces.
4. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
5. Close openings in exterior surfaces to protect existing work (and salvage items) from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

D. Installation:

1. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate OWNER occupancy.
2. Remove, cut, and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition according to Section 01 70 00
3. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes according to Section 01 70 00.
4. Recover and refinish Works that exposes mechanical and electrical work exposed accidentally during the Works.
5. Install products as specified in individual Sections.

E. Transitions:

1. Where new Works abuts or aligns with existing, perform a smooth and even transition. Patch the Works to match existing adjacent Works in texture and appearance.
2. When finished surfaces are cut so that a smooth transition with new Works is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to ENGINEER.

F. Adjustments:

1. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
2. Where a change of plane of 6 mm or more occurs, submit recommendation for providing a smooth transition for ENGINEER review.
3. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

G. Repair of Damaged Surfaces:

1. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
2. Repair substrate prior to patching finish.

H. Finishes:

1. Finish surfaces as specified in individual Sections.
2. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

- I. Cleaning: In addition to cleaning specified in Section 01 50 00, clean OWNER-occupied areas of work.

#### 1.10 PROGRESS CLEANING

- A. Execute cleaning during progress of the Works and as required by the General Conditions.
- B. Requirements of Regulatory Agencies:

1. In addition to the requirements herein, maintain the cleanliness of the Works and surrounding premises within the Works limits to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
  2. Comply with all federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- C. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials on or within the Works or on the premises surrounding the Works.

#### 1.11 FINAL CLEANING

- A. Execute final cleaning prior to Substantial Performance of the Works.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Clean debris from roofs, gutters, downspouts, and drainage systems.
- E. Clean the Site; rake clean landscaped surfaces.
- F. Repair roads, sod, and all other areas affected by construction operations and restore them to original condition or to minimum condition specified.
- G. Maintain cleaning until acceptance and occupation by OWNER.

#### 1.12 FINAL DECONTAMINATION

- A. Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from the Site.
- B. Perform decontamination as specified in Section 01 50 00 to the satisfaction of ENGINEER. ENGINEER will have the right to direct CONTRACTOR to perform additional decontamination if required.

#### 1.13 REMOVAL AND DISPOSAL

- A. Remove surplus materials and temporary facilities and controls from the Site.
- B. Dispose of all non-contaminated waste materials, litter, debris, and rubbish off Site.
- C. Do not burn or bury rubbish and waste materials on Site.
- D. Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- E. Do not discharge wastes into streams or waterways.

- F. Dispose of the following materials at an appropriate off-Site facility identified by CONTRACTOR and approved by OWNER:
  - 1. Debris including excess construction material, non-contaminated litter, and rubbish.
  - 2. Spent Tyvek and other disposable personal protective equipment worn during final cleaning.
  - 3. Wastewater removed from wastewater storage tank, wastewater generated from final decontamination operations including wastewater storage tank cleaning.
  - 4. Lumber from the decontamination pads.
  - 5. Volatile or hazardous wastes such as mineral spirits, oil, or paint thinner.
- G. Dispose of materials as approved by ENGINEER.
- H. Wastewater: Sample and analyze stored wastewater for disposal purposes prior to removal from the Site. The results of the analyses will determine the appropriate methods of disposal. Upon receipt of the analytical results, ENGINEER will instruct CONTRACTOR to transfer tank contents without spills or release to off-Site disposal facility. Following completion of tank emptying, decontaminate the tank interior with a steam or high-pressure water wash supplemented by detergent (Alconox). Dispose of tank decontamination water with tank contents.

#### 1.14 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

#### 1.15 PROTECTION

- A. Protect installed work and provide special protection where specified in individual Sections.
- B. Provide temporary and removable protection for installed products. Control activity in the immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic on landscaped areas.
- G. Maintenance of Flow: Maintain the flow of water in the water distribution system and in existing sewers, drains, and watercourses. In the event that any emergency or situation should arise which requires interruption of normal operation of any existing systems, restore normal operation as soon as possible even though permission for such planned shutdown was obtained.
- H. Flotation: Take necessary precautions against the flotation of any structures during construction. Make good any damage caused by flotation.

#### 1.16 CLOSEOUT PROCEDURES

- A. Submit written certification that the Contract Documents have been reviewed, the Works has been inspected, and that the Works is complete according to the Contract Documents and in compliance with Laws and Regulations including, but not limited to, the provision of all applicable federal, state, and local health, safety, and environmental laws and regulations, including OHSA, and ready for ENGINEER's review.
- B. Submit final Application for Payment identifying previous payments and amounts remaining due.
- C. Complete and furnish submittals to ENGINEER that are required by governing or other authorities and by the Contract Documents. Payment shall not become due and payable until all submittals have been made acceptable to ENGINEER.
- D. OWNER will occupy portion of the Site as specified in Section 01 10 00.

#### 1.17 PROJECT RECORD DOCUMENTS

- A. Maintain one set of the following Project record documents on Site; record actual revisions to the Works:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Change Orders and other modifications to the Contract.
  - 4. Reviewed Shop Drawings, product data, and Samples.
  - 5. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by OWNER.
- C. Store Project record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record, at each Section of the Specifications, a description of actual products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by modifications.
- F. Project Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finished floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Works.
  - 4. Field changes of dimension and detail.
  - 5. Details not on original Drawings.
- G. Remove ENGINEER title block and seal from all documents generated by CONTRACTOR.
- H. Submit documents to ENGINEER with claim for final Application for Payment. Provide in progress survey information to support progress claim amounts.



#### 1.18 SPARE PARTS, MAINTENANCE MATERIALS, AND EXTRA MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Sections.
- B. Deliver to the Site; obtain receipt from ENGINEER or OWNER.
- C. Provide list of spare parts and maintenance and extra materials furnished prior to final payment.

#### 1.19 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 216 mm by 279 mm (8.5"x11") text pages, binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of Project.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below, with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of ENGINEER, CONTRACTOR, Subcontractors, and major equipment Suppliers.
  - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Section. For each category identify names, addresses, and telephone numbers of Subcontractors and Suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
  - 3. Maintenance instructions for equipment and systems.
  - 4. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
  - 5. Part 3: Project documents and certificates, including the following:
    - a. Shop Drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Photocopies of warranties.
- E. Submit one draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with ENGINEER's comments. Revise content of all document sets as required prior to final submission.
- F. Submit two sets of revised final volumes within 10 days after final inspection.

#### 1.20 WARRANTIES

- A. Obtain warranties, executed in duplicate by responsible Subcontractors and Suppliers, within 14 days after completion of the applicable item of work. Except for items put into use with

OWNER's permission, leave date of beginning of time of warranty open until the date of Substantial Performance is determined.

- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties until time specified for submittal.
- E. Bind in commercial quality 216 by 279 mm (8.5"x11") binders with durable plastic covers. Identify each binder with typed title WARRANTIES, with title of Project; name, address, and telephone number of CONTRACTOR and equipment Supplier; and name of responsible company principal. Neatly type Table of Contents, in the sequence of the Table of Contents of the Contract Documents, with each item identified with the number and title of the Section in which specified, and the name of the project or work item. Separate each warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor and Supplier, with name, address, and telephone number of responsible principal.
- F. For equipment or component parts of equipment put into service during construction with OWNER's permission, submit documents within 10 days after acceptance. Make other submittals prior to final Application for Payment.
- G. For items of the Works for which acceptance is delayed beyond the date of Substantial Performance, furnish updated submittal within 10 days after acceptance of the affected item. The date of acceptance of such item shall be the start of the warranty period for that item.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 02 56 13.16  
GEOSYNTHETIC CLAY LINER

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Geosynthetic clay liner for Phase 2 MSW Final Cover System including leak detection layer.
- B. Related Requirements:
  - 1. Section 31 23 23 – Fill.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Geosynthetic Clay Liner:
    - a. Schedule of Prices Item No. 02 56 13.16/1.
    - b. Measurement Basis: By square metre measured in place of the area covered with GCL, not including anchor trenches or overlap, which must be factored into the unit price.
    - c. Payment Basis: Unit price. Includes supply, installation, testing, anchoring, overlap, repairs, connections to penetrations.

1.3 REFERENCES

- A. Definitions:
  - 1. GCL: Geosynthetic clay liner. Factory manufactured hydraulic barrier consisting of granular sodium bentonite clay, sandwiched between and supported and encapsulated by two geotextiles held together by needle punching.
  - 2. Geotextile: Semi-permeable woven or nonwoven fabric used to contain the bentonite used in a GCL.
  - 3. SMDD: Standard Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D698.
  - 4. Needle Punching: The process of GCL manufacturing whereby barbed needles incorporate the stable fibers from a nonwoven geotextile through a sodium bentonite clay layer into the matrix of a second geotextile layer.
  - 5. Sodium Bentonite: High swelling clay consisting primarily of the mineral montmorillonite.
  - 6. Thermal Locking: Needle punching enhancement process utilizing heat to bond needle punched fibers and permanently lock them into a second geotextile to increase the internal shear strength of the GCL.
  - 7. MARV: Minimum Average Roll Value. Average value for a specified parameter less two standard deviations, providing a 95 percent confidence level.

B. Reference Standards:

1. ASTM International:
  - a. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - b. D4354 - Standard Practice for Sampling of Geosynthetics and Rolled Erosion Control Products (RECPs) for Testing.
  - c. D6496 - Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners
  - d. D5993 - Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liners
  - e. D4759 - Standard Practice for Determining the Specification Conformance of Geosynthetics.
  - f. D5887 - Standard Test Method for Measurement of Index Flux through Saturated Geosynthetic Clay Liner Specimens using a Flexible Wall Permeameter.
  - g. D5889 - Standard Practice for Quality Control of Geosynthetic Clay Liners.
  - h. D5890 - Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liner.
  - i. D5891 - Standard Test Method for Fluid Loss of Clay Mineral Component of Geosynthetic Clay Liner.
  - j. D5993 - Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liner.
  - k. D6243 - Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by the Direct Shear Method.
  - l. D6496 – Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners.
  - m. D6768 – Standard Test Method for Tensile strength of Geosynthetic Clay Liners.
2. Geosynthetic Institute
  - a. GRI-GCL3 Standard Specification for “Test Methods, Required Properties, and Testing Frequencies of Geosynthetic Clay Liners”

1.4 COORDINATION

- A. Coordinate work of this Section with surface preparation work and installation of structures which will penetrate GCL.

1.5 PRE-INSTALLATION MEETING

- A. Convene minimum 1 week prior to commencing work of this Section.
- B. Purpose of meeting is to:
  1. Define Site-specific quality control and monitoring procedures.
  2. Discuss pre-installation submittals.
  3. Identify daily schedule.
  4. Discuss schedule.
  5. Identify manufacturer's representative.
  6. Methods of installation.
  7. Sequence of installation.

## 1.6 SUBMITTALS

- A. Product Data: No later than 14 days prior to ordering, submit GCL manufacturer's product data including installation, handling, storage, and repair instructions.
  - 1. Include statement and certificate of compliance of raw materials.
  - 2. Include statement for basis of property values of raw materials and GCL.
- B. Manufacturer's Instructions: Submit manufacturer's installation instructions at least 14 days prior to installation.
- C. Manufacturer's Certificates:
  - 1. Deliver each roll to the Site accompanied by manufacturer's certificate.
  - 2. Identify each roll by unique manufacturing number.
  - 3. Include results of at least the following tests: moisture content, swell index, fluid loss of bentonite, grab strength, peel strength, permeability, and mass per unit area of GCL.
  - 4. Quality control certificates signed by manufacturer.
  - 5. Certificates pertaining to raw materials and manufactured rolls including, but not limited to storage, handling, and shipping of GCL. Engineer will review test results for completeness and compliance with required minimum properties for both raw materials and manufactured rolls. Materials and rolls not in compliance with minimum required properties will be rejected.
- D. Daily Field Installation Report.
  - 1. Submit no later than 1 day following date covered by the report. Include:
    - a. Total amount and location of GCL placed.
    - b. Identifiers of rolls and fabricated blankets.
    - c. Changes in layout drawings.
    - d. Record of defects caused during transportation and handling.
    - e. Observations of weather conditions, and results.
    - f. Observations of anchor trench excavation, backfilling, and compaction.
    - g. Observations of seams around appurtenances, and connection to appurtenances.
    - h. Observations of repairs, including locations and name of repairer.
- E. Layout Drawings: No later than 14 days prior to installation, submit drawings of proposed GCL placement pattern.
- F. Installer Qualifications:
  - 1. Submit copy of manufacturer's approval letter or license no later than 14 days prior to installation.
  - 2. Demonstrate previous GCL installation experience for projects totaling at least 93,000 m<sup>2</sup>. Submit a project reference list including a minimum of three projects successfully completed within the last 3 years.
- G. Manufacturer's Qualifications: No later than 14 days prior to ordering, submit a list of previous projects totaling 280,000 m<sup>2</sup> of installation, and five projects including name of project, description of project, area, client's name and address, contacts, and telephone numbers; engineer's name, address, contact, and telephone number; installer's name, address, contact, and telephone number; and date installed.

## 1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Indicate panel layout including panel identifiers, date placed, installer's name, location of seams, and location and details of repairs.

- B. Warranties: Completed original warranty forms filled out in Owner's name and registered with manufacturer.

#### 1.8 QUALITY ASSURANCE

- A. Certifications: Prior to shipment to the Site, provide manufacturing quality control documentation on specified rolls of GCL, demonstrating that all quality control test methods, frequency, and acceptance criteria meet the requirements of this Section.

#### 1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years documented experience.
- B. Installer: Company specializing in performing work of this Section with minimum 3 years documented experience and approved by manufacturer.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. The manufacturer shall assume responsibility for initial loading and shipping of GCL.
- B. Prior to shipment, obtain manufacturer's approval for methods of unloading GCL.
- C. Lift GCL rolls by inserting a strong iron bar, supplied by manufacturer and sized to limit deflection detrimental to GCL, through the roll core. Attach slings or lifting chains at both ends of bar. Use a spreader bar to support and spread the slings. Ensure bar and support pipe are long enough to prevent damage to liner edges during hoisting.
  - 1. Do not lift GCL rolls by wrapping straps around the ends of rolls.
  - 2. Do not drag, lift from one end, lift with forks of a lift truck, or push GCL rolls to the ground from delivery vehicle.
- D. Store GCL rolls in a clean, dry area in their original, unopened, wrapped cover. To prevent moisture damage, repair minor rips or tears in plastic packaging with moisture resistant tape prior to placing in storage. Store GCL rolls on pallets and cover with heavy protective tarpaulin, or enclose within a storage facility. Keep GCL blanket clean and free from debris prior to installation. Do not store GCL more than four rolls high or as instructed by manufacturer.
- E. Notify Engineer 3 days in advance of GCL delivery to the Site. Perform joint inspection with Engineer upon delivery. Defects or damage from shipping and handling will be grounds for rejection of a portion of GCL or of the entire GCL roll at Engineer's discretion. Remove rejected material from the Site and replace with new material.

#### 1.11 AMBIENT CONDITIONS

- A. Do not install when climatic conditions, as determined by Engineer or as per manufacturer's instructions, are unsatisfactory.
- B. Install on dry ground.
- C. Comply with manufacturer's installation instructions.

## 1.12 WARRANTY

- A. Furnish 5-year manufacturer's warranty against manufacturing defects.
- B. Include coverage for:
  - 1. Defective product not in compliance with requirements of this Section.
  - 2. Replacement of GCL with new material, including costs associated with installation.

## PART 2 PRODUCTS

### 2.1 GCL

- A. Manufacturers:
  - 1. Solmax (formerly GSE)
  - 2. CETCO
  - 3. Or manufacturer providing an approved equivalent product.
- B. Prefabricated in a manufacturing facility using uniform layer of natural sodium bentonite containing 90 percent sodium montmorillonite sandwiched between two layers of support materials to contain the bentonite.
- C. Manufactured by mechanically bonding geotextiles using a needle punching process.
  - 1. Glues, adhesives, or other non-mechanical bonding processes may not be used in lieu of needle punch process but are permitted to enhance the physical properties of the GCL.
  - 2. Neither support materials nor adhesives shall interfere with the swelling, self-healing, or low permeability characteristics of the bentonite.
- D. Upper Support Layer: Non-Woven geotextile, or approved equivalent.
- E. Lower Support Layer: Woven geotextile, or approved equivalent.
- F. Upper and lower geotextile with needle punched reinforcement together.

#### G. GCL Properties (Per GRI-GCL3 for Reinforced GCL):

Property	Unit	Test Method	Value
<b><u>Geotextile</u></b>			
Cap Nonwoven, Mass/Unit Area, reinforced GCL	g/m <sup>2</sup>	ASTM D5261	200 (minimum)
Carrier Woven, Mass/Unit Area, reinforced GCL	g/m <sup>2</sup>	ASTM D5261	100 (minimum)
<b><u>Bentonite</u></b>			
Moisture Content	percent	ASTM D5993	35 (maximum)
Free Swell	mL/2 g	ASTM D5890	24 (minimum)
Fluid Loss	mL	ASTM D5891	18 (maximum)
<b><u>GCL</u></b>			
Bentonite Mass (Dry)	g/m <sup>2</sup>	ASTM D5993	3700 (minimum)
Grab Tensile Strength	kN/m	ASTM D6768	4.0 (minimum)

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Peel Strength	N/m	ASTM D6496	360 (minimum)
Permeability	m/s	ASTM D5887	$5 \times 10^{-11}$ (maximum)
Internal Shear Strength	kPa	ASTM D6243	24 (minimum)

## 2.2 MATERIALS

- A. Bentonite Sealing Compound and Granular Bentonite:
1. Supplied by manufacturer and comprised of the same bentonite used in manufacturing the GCL.
    - a. Bentonite Sealing Compound: A mixture of non-aqueous liquid suspension agents which create a paste-like texture.
    - b. Furnish granular bentonite in 23 kg bags.
  2. Suspension Agents Used in Manufacture of Bentonite Sealing Compound: Non-toxic, water soluble, and not restrictive of the bentonite's ability to swell and absorb water upon hydration.

## 2.3 SOURCE QUALITY CONTROL

- A. Perform manufacturer's quality assurance testing at frequency shown in ASTM D5889.
- B. Test results not meeting the requirements of PART 2 – GCL shall result in the rejection of applicable rolls.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Obtain written approval of GCL manufacturer's qualified representative that surface is acceptable prior to placing GCL.

### 3.2 PREPARATION

- A. Do not begin installation of GCL until a proper subgrade has been prepared and approved by ENGINEER and manufacturer.
- B. Prepared Surface: Free from loose earth, exposed rocks larger than 12 mm in diameter, protrusions larger than 12 mm, rubble, and other foreign matter.
- C. Compact the subgrade uniformly to a minimum of 95 percent SMDD smooth with a drum roller.
- D. Ensure the surface on which GCL is to be placed is free of standing water and maintained in a firm, clean, and smooth condition during liner installation.

### 3.3 ANCHORING

- A. Anchor according to manufacturer's instructions and as shown on Drawings.



- B. Backfill the anchor trench with structural backfill and compact to 95 percent SMDD at optimum moisture immediately upon placement of GCL in anchor trench.

### 3.4 PANEL PLACEMENT

- A. As each roll is moved from the storage area, remove the labels and submit to Engineer.
- B. Transport GCL rolls to the area to be lined with a front-end loader and set up support pipes so that GCL roll is fully supported across its length. Use manufacturer supplied spreader bar or manufacturer approved device to prevent lifting chains or slings from damaging the edges.
- C. Do not drag GCL panels over the surface.
- D. Place GCL according to manufacturer's recommendations and as specified herein.
- E. Place GCL over prepared surface in a manner to assure minimum handling. Excavate the anchor trench for the area to be lined before commencing GCL installation.
- F. Do not place horizontal seams on slopes steeper than 5 horizontal to 1 vertical. Place cover material over GCL on the same day as placement. Unpackage and place in position only those GCL panels which can be anchored and covered the same day.
- G. In areas where wind is prevalent, commence GCL installation upwind and proceed downwind. Secure the leading edge of GCL at all times with sandbags or other adequate ballast.
- H. Install GCL in a relaxed condition, free of tension or stress upon completion of installation. Stretching of GCL to fit is not permitted. Straighten GCL to smooth out creases or irregularities in runs. Maintain overlaps free of wrinkles, folds, or fish-mouths
- I. Do not install GCL in standing water or when raining. GCL must be dry when installed and dry when covered unless specified otherwise by manufacturer.

### 3.5 SEAMING

- A. Once first run has been laid, lay adjoining runs with a 150 mm minimum overlap on the longitudinal seams and 600 mm on end seams, or as specified by manufacturer.
- B. If temperature during placement is higher than 29 degrees C and humidity is low, contraction may occur soon after placement when no confining stress or soil cover is placed. In order to account for contraction under these conditions, increase the seam overlap to a minimum of 305 mm on longitudinal seams and 1000 mm on end seams, or 4 percent of the distance to the next parallel seam, whichever is greater.
- C. Remove dirt, gravel, or other debris from the overlap area. Place minimum 0.37 kg/m of granular bentonite in seam to seal or as otherwise recommended by manufacturer.
- D. Place seam overlap on the bottom so that the direction of flow is from the top sheet to the bottom sheet to form a shingle effect.
- E. Heat bond seams after applying bentonite.

- F. On slopes, make runs continuous from crest to toe with GCL machine direction running perpendicular to the base.

### 3.6 PATCHING AND REPAIRS

- A. Overlap repair patches in installed GCL with a minimum of 305 mm on all patches. Secure horizontal patch seams with a non-toxic, water soluble, adhesive glue approved by manufacturer. Place granular bentonite along overlap according to manufacturer's instructions.

### 3.7 PROTECTION

- A. Do not permit vehicular traffic directly on GCL.
- B. Cover overlying materials as indicated.
- C. Minimum cover requirements for equipment ground pressure ratings are as follows:

<b>Equipment Ground Pressure (kPa)</b>	<b>Minimum Cover Over Geomembrane (mm)</b>
< 70	300
70-140	600
> 140	900

### 3.8 SEALING AROUND PENETRATIONS

- A. Seal GCL around penetrations, pipes, and structures shown on the Drawings and according to manufacturer's recommendations.
- B. Pipe penetrations shall incorporate a collar of GCL wrapped around the pipe and securely fastened. Place bentonite sealing compound around the penetration.
- C. Use an additional GCL skirt placed over the bentonite sealing compound to provide a third level of protection and prevent the bentonite sealing compound from being displaced.

### 3.9 FIELD QUALITY CONTROL

- A. As each GCL panel is being deployed, provide full-time inspection of the installation.
- B. Installation: Include as a minimum:
  1. Record each roll number and lot number as panels are deployed along with a general description of the location of each panel.
  2. Inspect overlap.
  3. Visually inspect geotextile quality, bentonite uniformity, and degree of hydration, if any, on the GCL. Mark areas requiring repair.
  4. Inspect anchoring and sealing around penetrations and structures.
- C. Engineer may cut a 305 mm long sample from rolls and submit to an independent laboratory for conformance to requirements in Part 2.

END OF SECTION

SECTION 02 66 13  
LANDFILL GAS VENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Excavation for landfill gas vents strips.
  2. Installation of landfill gas vent strips and vent riser pipe.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  2. Landfill Gas Vent Strips:
    - a. Schedule of Prices Item No. 02 66 13/1.
    - b. Measurement Basis: By linear metre measured in place along the length of the trench to the conversion point from geoment to gas vent riser.
    - c. Payment Basis: Unit price. Includes trenching, supply and install of vent strip, loading, hauling, and placing sand backfill, accessories and fittings to attach to gas vent riser.
  3. Landfill Gas Vent Riser Pipes:
    - a. Schedule of Prices Item No. 02 66 13/2.
    - b. Measurement Basis: By number (each) of installations measured in place.
    - c. Payment Basis: Unit price. Includes supply and installation of vent riser piping, slotted and solid wall pipe, complete with threaded and coupled joints, surface fittings, and loading, hauling, and placing backfill around vent riser pipe for continuous final cover subgrade.

1.3 REFERENCES

- A. Reference Standards:
1. Section 01 40 00 - Quality Requirements: Requirements for references.
  2. Landfill Gas Management Facilities Design Guidelines. British Columbia Ministry of Environment. March 2010.
  3. ASTM International:
    - a. ASTM D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

1.4 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Make provisions for placing excavated or augered waste cuttings at the location of OWNER's solid waste disposal operations in the sequence of construction.

- C. Complete pre-grading of the area to receive the vent strip. Prior to placing final cover system, install landfill gas vent strip and riser into the waste. Proceed with final cover system around the vent riser pipe.

#### 1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Include manufacturer's data sheets for vent strips and pipe materials and couplings. Submit no later than 10 days prior to ordering.
- C. Shop Drawings: Indicate vent riser connection details from perforated screen pipe sections to solid piping section; cover/vent seal details and pipe connections to above-grade piping. Submit no later than 10 days prior to ordering.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout submittals.
- B. Project Record Documents: Indicate actual locations of vent strips and vent riser pipes and notes regarding installation problems.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three (3) years documented experience.
- B. Perform work of this Section according to British Columbia Ministry of Environment Landfill Gas Management Facility Design Guidelines.

#### 1.8 EXISTING CONDITIONS

- A. All work undertaken at or below the surface of the final cover of the landfill must assume that landfill gas may be present. Landfill gas is comprised of methane, carbon dioxide, and a wide range of trace gases.
- B. Do not undertake any heat fusion or any open flame operation when combustible gas concentrations are above 20 percent of the lower explosive limit.

### PART 2 PRODUCTS

#### 2.1 RISER PIPE ASSEMBLY

- A. ASTM D1784, Schedule 80 slotted PVC, 100 mm ID; 1.5 m screen length; threaded and flush coupled joints.
- B. ASTM D1784, Schedule 80 solid PVC, 100 mm ID; threaded and flush coupled joints.

- C. Accessories:
  - 1. Fittings/caps: Factory fabricated (not field fabricated) unless otherwise shown on the Drawings. Same material as pipe molded or formed by thermal fusion to suit pipe size and end design in required tees, bends, elbows, reducers, traps, and other configurations required. Equivalent or greater pressure rating than pipe when installed. Fabricated sweeps, other than 90 degree vertical bend, shall be large radius multiple segmented to permit ease of access for maintenance equipment.
  - 2. Joints: Threaded and solvent welded flush couplings.
  - 3. Sreen: 0.010 slot screen in locations shown on Drawings.

## 2.2 GEOVENT

- A. Manufacturer: CETCO
- B. Product: GeoVent™ or approved equivalent.
- C. Accessories for completing connections from venting strip to vertical vent.

## 2.3 SAND

- A. Pit Run Sand as per Section 31 23 23.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 70 00 - Execution Requirements: Verification of existing conditions before starting work.
- B. Verify that all required safety provisions necessary to perform the Works are in place and have been tested.
- C. Verify that surfaces and Site conditions are ready to receive work.
- D. Verify that the Site conditions will support equipment for performing operations.
- E. Do not commence excavating until ENGINEER has inspected location of each vent.
- F. Dispose of excavated materials in the footprint of Phase 2 MSW Area or location approved by Engineer.

### 3.2 LANDFILL GAS VENT INSTALLATION

- A. Pre-clean pipe before installation.
- B. Extend perforations in the riser pipe from the base of excavation to 300 mm below the tee connection.

- C. Install each gas vent in accordance with the details as shown on the Drawings, in accordance with manufacturer's recommendations, and as directed by ENGINEER.
- D. Install cover system to the approval of ENGINEER.

### 3.3 GEOVENT

- A. Prevent debris and water from entering Geovent.
- B. Avoid excessive transportation and damage to Geovent.
- C. Install in accordance with manufacturer's instructions.
- D. Place sand backfill around geovent as indicated on Drawings.
- E. Maintain positive drainage for all gas collection and venting trenches.

### 3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Requirements for tolerances.
- B. Gas Vents Maximum Variation from Horizontal Position shown on Drawings: 3 m.

### 3.5 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protection of installed work.
- B. Protect finished work until all the work of this Contract has been completed and approved by ENGINEER. Ensure protection during installation of cover systems adjacent to vent.

END OF SECTION

SECTION 31 05 19.13  
GEOTEXTILES FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Geotextile for separation layer in the final cover system.
- B. Related Requirements:
  - 1. Section 31 23 23 - Fill.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Separation Geotextile:
    - a. Schedule of Prices Item No. 31 05 19.13/2.
    - b. Measurement Basis: By square metre measured in place of area covered with geotextile, not including anchor trenches.
    - c. Payment Basis: Unit price. Includes supply, installation, seaming, connection to penetrations, testing, anchoring, overlaps, and repairs.

1.3 REFERENCES

- A. Definitions:
  - 1. Geotextile: Synthetic fabric for use in geotechnical filter, separation, stabilization, or erosion control applications.
  - 2. Minimum Average Roll Value: Average value for a specified parameter less two standard deviations.
- B. Reference Standards:
  - 1. ASTM International:
    - a. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
    - b. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
    - c. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
    - d. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
    - e. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
    - f. ASTM D4873 – Standard Guide for Identification, Storage and Handling of Geosynthetic Rolls and Samples.
    - g. ASTM D5199 - Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
    - h. ASTM D5261 - Standard Test Method for Measuring Mass Per Unit Area of Geotextiles.



- i. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
- j. ASTM D7238 - Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus
2. American Association of State Highway and Transportation Officials (AASHTO), M288, Standard Specification for Geosynthetic Specification for Highway Applications

#### 1.4 COORDINATION

- A. Coordinate installation of geotextile with surface preparation and placement of adjacent materials.
- B. Sequence work of this Section with work of other Sections.

#### 1.5 PRE-INSTALLATION MEETING

- A. Convene minimum one week prior to commencing work of this Section. Coordinate with pre-installation meeting for other geosynthetics.
- B. Purpose of Meeting:
  1. Define Site-specific quality control and monitoring procedures.
  2. Discuss pre-installation submittals.
  3. Identify daily schedule.

#### 1.6 SUBMITTALS

- A. Product Data: Submit no later than 14 days prior to ordering.
- B. Manufacturer's Instructions: Submit at least 14 days prior to installation. Include installation, handling, storage, and repair instructions.
- C. Manufacturer's Certificates:
  1. Deliver each roll to the Site accompanied by manufacturer's certificate.
  2. Identify each roll by unique manufacturing number.
  3. Include results of at least the following tests: unit weight, tensile strength, elongation at break, Mullen Burst strength, puncture strength, permittivity, apparent opening size, ultraviolet stability, and manufacturer's records for storage, handling, and shipping of geotextile.
  4. Quality control certificates signed by manufacturer and notarized.
- D. Daily Field Installation Report. Submit no later than 1 day following date covered by report. Include:
  1. Total amount and location of geotextile placed.
  2. Identifiers of rolls.
  3. Changes in layout drawings.
  4. Record of defects caused during transportation and handling.
  5. Observations of weather conditions, and results.
  6. Observations of anchor trench excavation, backfilling, and compaction.
  7. Observations of repairs, including locations and name of repairer.

- E. Layout Drawings: Submit drawings of proposed geotextile placement patterns or alternative. Provide no later than 14 days prior to installation.
- F. Qualification Statements:
  - 1. Installer: Submit copy of manufacturer's approval letter or license no later than 14 days prior to installation.
  - 2. Manufacturer: Submit no later than 14 days prior to ordering, list of previous projects totaling 280,000 m<sup>2</sup> of installation, and five projects including name of project, description of project, area, client's name and address, contacts, and telephone numbers; engineer's name, address, contact, and telephone number; installer's name, address, contact, and telephone number; and date installed.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of geotextile installation.
- B. Warranties: Completed original warranty forms filled out in Owner's name and registered with manufacturer.

#### 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 20 projects, 930,000 m<sup>2</sup> of manufacturing, and 3 years documented experience.
- B. Installer: Company specializing in performing work of this Section with minimum three years of experience.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver geotextile bearing manufacturer's seals and labels intact. Clearly label each roll to show geotextile identification, date of manufacture, lot number, analysis of contents, and special instructions.
- B. Store and handle geotextile according to manufacturer's recommendations and ASTM D4873, indoors, in manufacturer's original covers. Protect from moisture, dust, light, and heat.
- C. Use appropriate handling equipment when moving geotextile from one place to another.
- D. Notify Engineer three days in advance of delivery to the Site. Perform joint inspection with Engineer upon delivery. Defects or damage from shipping and handling will be grounds for rejection of a portion of geotextile or of the entire geotextile roll at Engineer's discretion. Remove rejected material from the Site and replace with new material.

#### 1.10 AMBIENT CONDITIONS

- A. Install geotextile in dry conditions and according to manufacturer's instructions.
- B. Suspend installation operations whenever climatic conditions are unsatisfactory for placing geotextile to the requirements of this Section.

## PART 2 PRODUCTS

### 2.1 GEOTEXTILE

- A. Non-woven Geotextile
  - 1. AASHTO M288-1 Survivability Class 2.
  - 2. Application: separation and drainage.
- B. Manufacturers
  - 1. TenCate Mirafi
  - 2. SKAPS
  - 3. Approved equivalent.

### 2.2 SOURCE QUALITY CONTROL

- A. Manufacturer Quality Control:
  - 1. Sample and test geotextile material at a minimum once every 9,300 m<sup>2</sup> for unit weight, tensile strength, elongation, hydraulic burst strength, puncture strength, and trapezoid tear strength to demonstrate that the material conforms to requirements specified in PART 2, GEOTEXTILE. Test for UV stability and apparent opening size at a minimum once every month.
  - 2. Perform samples on sacrificial portions of material so that repair of material is not required.
  - 3. If geotextile sample fails to meet the quality control requirements of this Section, sample and test each roll manufactured in the same lot, or at the same time, as the failing roll. Continue sampling and testing of rolls until a pattern of acceptable test results is established.
  - 4. At geotextile manufacturer's discretion and expense, additional testing of individual rolls may be performed to more closely identify the non-complying rolls and/or to qualify individual rolls.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces and Site conditions are ready to receive work

### 3.2 PREPARATION

- A. Prior to geotextile placement, where possible roll the surface with a smooth drum steel or pneumatic roller to avoid irregularities, loose earth, and abrupt changes in grade. Provide necessary equipment and personnel to maintain an acceptable supporting surface during fabric installation.
- B. Examine geotextile for defects including rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or handling.
- C. Remove defective or damaged geotextile from the Site.

- D. Prepare anchor trenches according to the Drawings.

### 3.3 INSTALLATION

- A. Notify Engineer at least 24 hours in advance of intention to commence placement of geotextile.
- B. Do not permit placement of overlay materials until Engineer has inspected and approved installation of geotextile.
- C. Obtain approval of Engineer prior to installation of geotextile.
- D. Place geotextile on a prepared base as shown on the Drawings.
- E. Unfold or unroll geotextile according to manufacturer's instructions, directly on prepared base, in conditions which will prevent damage to both geotextile and base grade. Unsuitable conditions include, but are not limited to moderate to high wind conditions.
- F. Overlap Dimensions and Method of Joining Adjacent Sheets: According to manufacturer's instructions.
  - 1. Non-woven Geotextile above the HDPE geomembrane is not to be mechanically joined, but is to be overlapped a minimum of 300 mm along adjacent panel sides and minimum of 1,000 mm on adjacent panel ends. Thermal bonding of these overlaps is permitted.
- G. Do not entrap stones in geotextile during placement.
- H. Do not expose geotextiles designated to have overlying layers to sunlight for more than 14 days, or less if recommended by manufacturer.
- I. Position and deploy geotextile to minimize handling. Lay smooth and free of tension, stress, folds, or creases. Protect properly placed geotextile from displacement, contamination by surface runoff, or damage, until and during placement of overlaid materials.
- J. Place geotextile on sloping surfaces in one continuous length.
- K. Do not permit passage of vehicular traffic directly on geotextile at any time.
- L. Place geotextile by unrolling onto graded surface and retain in position as specified.
- M. Remove and replace damaged or deteriorated geotextile as directed by Engineer.
- N. Protect installed geotextile material from dust, fine particles, and debris prior to placing overlying layer.

### 3.4 FIELD QUALITY CONTROL

- A. As each geotextile panel is being deployed, provide full time inspection of installation by Geotextile Installer:
  - 1. Recording of each roll number and lot number as panels are deployed along with a general description of location of each panel.
  - 2. Inspection of overlap.
  - 3. Visual inspection of geotextile quality. Mark any areas as appropriate for repair.

4. Inspection of sewn seams.
  5. Inspection of anchoring.
- B. Engineer will inspect geotextile in place for tears, overlaps, and consistency before placing materials thereon. Damaged sections, as judged by Engineer, will be marked and their removal from the work area recorded. Repair minor damage and minor defects as specified in manufacturer's procedures when approved by Engineer to Engineer's satisfaction.
- C. Engineer will verify that weather conditions (air temperature, non-excessive wind, and lack of precipitation) are acceptable for panel placement.
- D. Conformance Testing:
1. Samples of geotextiles may be removed by Engineer and sent to laboratory for testing to ensure conformance with the requirements of this Section.
  2. This testing will be carried out prior to installation of geotextile.
  3. Samples may be taken at a minimum frequency of one sample per 9,300 m<sup>2</sup> with a minimum of one sample per lot.
  4. Engineer may increase the frequency of sampling in the event that test results do not comply with requirements of PART 2. This additional testing will be performed at Contractor's expense.
  5. As a minimum, perform the following conformance tests on each geotextile sample: mass per unit area; tensile strength; grab strength; tear strength; and puncture strength. AOS and permittivity tests will be performed at a frequency of one sample per lot.
  6. Geotextile material that is not certified according to PART 1, or that conformance testing indicates does not comply with PART 2, will be rejected by Engineer. Replace rejected material with suitable material, at no additional cost.

END OF SECTION

## SECTION 31 10 00

### SITE REMOVALS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Removing surface debris.
  - 2. Removing vegetation from areas with backfill and/or grading.
  - 3. Tree felling.
  - 4. Removing abandoned site features.
  
- B. Related Requirements:
  - 1. Section 01 10 00 – Summary.
  - 2. Section 31 23 16 – Excavation.
  - 3. Section 31 23 23 – Fill.

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 2. Site Removals (Electric Fence, Gates), Protections, and Clearing/Grubbing:
    - a. Schedule of Prices Item No. 31 10 00/1.
    - b. Measurement Basis: Lump sum.
    - c. Payment Basis: Lump sum price. Includes clearing vegetation (underbrush) from areas to be graded, placing material at top of landfill and covering with sand cushion, stockpiling excess stripped material at borrow pit, protection of existing monitoring wells and utility poles/overhead lines including utility location services, tree felling, clearing, and grubbing for installation of culvert letdown pipe, removal and disposal of existing electric fence and gate, clearing vegetation to shift perimeter access path on north and west sides of landfill, and dewatering, and pre-grading to allow for construction of Works in areas as shown on Drawings.

##### 1.3 REFERENCES

- A. Definitions:
  - 1. Clearing:
    - a. General Clearing: Cut off trees and brush vegetative growth to specified height above ground and dispose of felled trees, live or dead plant material, previously uprooted trees and stumps, visible boulders, and surface debris.
    - b. Tree clearing and grubbing: Cut trees to stump and remove stump. Backfill voids with native material.
    - c. Underbrush Clearing: Remove undergrowth, deadwood, and trees smaller than specified trunk diameter from treed areas and dispose of fallen timber and surface debris.
  - 2. Grubbing: Excavation and disposal of stumps, roots, and visible boulders and rock fragments of specified size to specified depth below existing ground surface.

3. SMDD: Standard Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D698.
- B. Reference Standards:
  1. Section 01 40 00 - Quality Requirements: Requirements for references.
  2. ASTM International:
    - a. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>

PART 2 PRODUCTS – Not Used.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 70 00 - Execution Requirements: Verification of existing conditions before starting work.
- B. Verify existing plant life designated to remain is tagged or otherwise identified.
- C. Identify waste area for placing removed materials.

### 3.2 PREPARATION

- A. Call local utility line information service not less than three (3) working days before performing work.
  1. Request underground utilities be located and marked within and surrounding construction areas.
- B. Coordinate work with utility companies and municipal authorities.
- C. Confirm with OWNER and ENGINEER regarding private utilities installed as shown on Drawings or otherwise.

### 3.3 PROTECTION

- A. Locate, identify, and protect utilities designated to remain from damage.
- B. Protect trees, plant growth, and features designated to remain as final landscaping.
- C. Protect benchmarks, monitoring wells, survey control points, and existing structures from damage or displacement.
- D. Minimize impact to adjacent areas by conducting only clearing and grubbing necessary to perform work of this Section.
- E. Control dust generation to avoid creating a nuisance in surrounding area.

### 3.4 CLEARING

- A. Clear areas required for access to the Site and execution of the Works.
- B. Cut stumps, roots, brush, and other vegetation in areas designated to be cleared, flush with or below original ground surface, except trees and vegetation shown on the Drawings or directed by ENGINEER to be left standing.
- C. When directed by ENGINEER, remove trees and stumps designated as trees from areas outside areas designated for clearing and grubbing; fell such trees, remove stumps and roots, and dispose of trees and debris.
- D. Clear undergrowth and deadwood without disturbing subsoil.
- E. Remove materials to be grubbed, together with logs and other organic or non-organic debris not suitable for reuse, to minimum 450 mm below original ground surface in areas shown on the Drawings to be grubbed, and in areas shown on the Drawings as construction areas.
- F. Fill depressions made by grubbing with suitable material and compact to minimum 95 percent SMDD to make surface conform with original adjacent ground surface.

### 3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life.
- B. Remove abandoned utilities. Indicate removal termination point for underground utilities on record documents.
- C. Continuously clean up and remove waste materials from the Site; do not allow waste materials to accumulate.
- D. Do not burn or bury waste materials on Site except as shown on Drawings for refuse grading and excavation. Leave the Site in clean condition.
- E. Dispose of trees, logs, stumps, roots, brush, rotten wood, and other refuse from clearing and grubbing operations as directed by ENGINEER. Provide certification of disposal for materials removed from the Site.
- F. Chip or remove and dispose of logs, trees, and branches 75 mm and 150 mm diameter, at location approved by ENGINEER or off Site.

END OF SECTION



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SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating for perimeter ditches.
2. Excavating trenches for landfill gas (header, subheader, lateral piping, condensate drain piping, electrical and communication cables, and culverts).
3. Backfilling and compaction.

B. Related Requirements:

1. Section 31 23 23 - Fill.
2. Section 33 42 13 – Pipe Culverts.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment:

1. Landfill Perimeter Ditch:
  - a. Schedule of Prices Item No. 31 23 16/1.
  - b. Measurement Basis: By linear metre.
  - c. Payment Basis: Unit price. Includes excavating and fine grading to required elevations and grades, loading, hauling, and placing materials in a temporary stockpile, for grading as Common Fill for final cover subgrade, and/or for Cover Soil (native soil with no waste) over geotextile in final cover.
2. Landfill Mid-slope Ditch
  - a. Schedule of Prices Item No. 31 23 16/2.
  - b. Measurement Basis: By linear metre.
  - c. Payment Basis: Unit price. Includes constructing mid-slope berm over final cover with Cover Fill and fine grading to required elevations and grades, loading, hauling, and placing materials in a temporary stockpile, and material testing.
3. Bypass Ditch (Leachate Treatment Area):
  - a. Schedule of Prices Item No. 31 23 16/3.
  - b. Measurement Basis: By linear metre.
  - c. Payment Basis: Unit price. Includes excavating, filling (berms), compacting, and fine grading to required elevations and grades, loading, hauling, and placing materials in a temporary stockpile or for shaping berms for bypass ditch.
4. Grading of Landfill Road-side Ditches:
  - a. Paid for separately under Section 31 23 23 Item 31 23 23/1 for waste relocation and Common Fill to subgrade and Item 31 23 23/4 for finished grading.
5. Trenching for landfill gas venting system and culverts:
  - a. Paid for separately under respective Sections 02 66 13 and 33 42 13, respectively.
6. Excavation of Waste for maintaining maximum grades and for grading landfill plateau.
  - a. Paid for separately under Section 31 23 23 (Item 31 23 23/1).
7. Excavation for Common Fill for preparing final cover subgrade.
  - a. Paid for separately under Section 31 23 23.
8. Excavation for Clear Crush Gravel.

- a. Paid for separately under Section 31 23 23.
9. Excavation of Select 50 mm Minus for access roads and manhole bases.
  - a. Paid for separately under Section 31 23 23 and 33 05 13, respectively.
10. Excavation for Cover Fill above final cover geotextile.
  - a. Paid for separately under Section 31 23 23.
11. Excavation for sand for pipe bedding and landfill gas venting system.
  - a. Paid for separately under Sections 02 66 13 and 33 42 13, respectively.

## PART 2 PRODUCTS - Not Used

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain from damage. Confirm locations of buried utilities and structures by careful test excavations or other suitable means.
- C. Protect plant life, trees, lawns, and other features remaining as a portion of final landscaping.
- D. Protect bench marks, survey control points, existing structures, fences, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities designated to remain.
- F. Maintain and protect from damage wells, utilities, and structures encountered.
- G. Protect existing surface features which may be affected during progress of work.
- H. Protect existing structures where temporary unbalanced earth pressures may develop on walls or other structures utilizing bracing, shoring, or other approved method to counteract imbalance.
- I. Protect monitoring wells and other structures and pipelines from uplift and displacement or disturbance during excavation operations.
- J. Employ procedures for excavation and trenching that avoid disturbance of utilities and structures.
- K. Protect excavations and trenches from contamination.
- L. Obtain direction from Engineer before moving or otherwise disturbing utilities or structures.
- M. Remove surface features or obstructions including, but not necessarily limited to, trees, shrubs, bush, and other vegetation from surfaces to be excavated, as required to construct the Works.
- N. Remove debris, snow, ice, water, soft soils, organic materials, or frozen ground from areas to be backfilled.

- O. Scarify subgrade surface to depth of 25 mm.
- P. Compact subgrade to required density for subsequent backfill materials.
- Q. Proof roll subgrade surface to identify soft spots. Cut out soft areas of subgrade not capable of compaction in place. Backfill with approved native fill and compact to density equal to or greater than specified requirements for subsequent fill material.
- R. Utilize excavated material suitable for backfill prior to importing fill materials.

### 3.2 EXCAVATION / PERIMETER DITCHES

- A. Excavate to lines, grades, elevations, and dimensions shown on the Drawings or as directed by Engineer.
- B. Slope banks with machine to angle of repose or less, unless shored.
- C. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- D. Trim excavation. Remove loose matter.
- E. Remove lumped subsoil, boulders, and rock.
- F. Notify Engineer of unexpected subsurface conditions.
- G. Hand trim, make firm, and remove loose material and debris from excavation. Where natural or fill material at bottom of excavation is disturbed, compact disturbed soil to density at least equal to undisturbed soil or to the density specified for the succeeding layer of backfill, whichever is greater, or remove disturbed soil and refill the space as directed by Engineer.
- H. Stockpile excavated material in designated on-Site area.
- I. Dispose of excavated material determined as unsuitable for backfill or excess excavated material, in a designated on-site spoil area.
- J. Repair or replace items designated to remain, damaged by excavation.

### 3.3 MID-SLOPE SWALES

- A. Place and compact berms for Mid-slope Swales on final cover.
- B. Grades to slopes and dimensions shown on the Drawings or as directed by Engineer.
- C. Trim excavation. Remove loose matter.
- D. Remove lumped subsoil, boulders, and rock.

### 3.4 OVER-EXCAVATION

- A. Notify Engineer when soil at the bottom of the excavation appears unsuitable and proceed as directed by Engineer. Where, in Engineer's opinion, the undisturbed condition of the soils is

inadequate for the support of installations, over-excavate to adequate supporting soils and backfill the excavated space with approved material to the proper elevation in accordance with the procedure specified for backfill. Use such over-excavated material in the Works or stockpile on the Site.

- B. Backfill in accordance with Section 31 23 23, Fill.
- C. Over-excavation for production of aggregate materials in accordance with Section 31 23 23, Fill.

### 3.5 TEMPORARY STOCKPILING

- A. Construct stockpile sites so that they are level, well drained, free of foreign materials, and of adequate bearing capacity to support the weight of the materials to be placed within stockpile.
- B. Provide and maintain access to stockpiles.
- C. Separate differing materials with substantial dividers or stockpile apart to prevent mixing. Stockpile excavated material separately from imported fill materials.
- D. Prevent contamination or segregation of soil types.
- E. Direct surface water away from stockpile sites to prevent erosion or deterioration of materials.
- F. Maintain temporary stockpile slopes not steeper than two horizontal to one vertical. In no instance shall stockpile lifts be greater than 5 m in height above surrounding grade. Place hay bales or other soil erosion and sediment control fencing at the base of and around each temporary stockpile to contain soil that may be washed off the stockpile.
- G. Maintain area surrounding stockpiles in neat and tidy condition.

### 3.6 TOLERANCES

- A. Within 50 mm greater or less than specified depth or to the grades shown on Drawings but not uniformly greater or less.

### 3.7 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

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SECTION 31 23 23

FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Backfilling.
2. Common Fill for establishing final cover subgrade and grading.
3. Cover Fill for placement over and protection of Separation Geotextile.
4. Clear Crush Gravel for placement over final cover drainage layer.
5. 50 mm Minus for landfill access roads.
6. Sand for pipe bedding and culverts.

B. Related Requirements:

1. Section 02 56 13.16 – Geosynthetic Clay Liner.
2. Section 31 05 19.13 – Geotextiles for Earthwork.
3. Section 31 23 16 - Excavation.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment:

1. Common Fill and Waste Relocation for Establishing Final Cover Subgrade:
  - a. Schedule of Prices Item No. 31 23 23/1.
  - b. Measurement Basis: By cubic metre as measured by survey methods measured immediately prior to placement and immediately following placement.
  - a. Payment Basis: Unit Price. Includes excavating, loading, hauling common fill (or waste for final cover subgrade only), temporary stockpiling, placing, grading, and testing.
2. 200 mm Thick Clear Crush Gravel Drainage Layer (Processed On-site):
  - b. Schedule of Prices Item No. 31 23 23/2.
  - c. Measurement Basis: By cubic metre as measured by survey methods measured immediately prior to placement and immediately following placement.
  - d. Payment Basis: Unit price. Includes screening from on-site borrow site, loading, hauling, stockpiling, placing, grading, and testing. Includes additional excavation and hauling required to produce contract volumes.
3. 300 mm Thick Landfill Access Road - Select 50 mm Minus:
  - a. Schedule of Prices Item No. 31 23 23/3
  - b. Measurement Basis: By cubic metre as measured by survey methods measured immediately prior to placement and immediately following placement.
  - c. Payment Basis: Unit price. Includes screening from on-site borrow site, loading, hauling, stockpiling, placing, grading, and testing. Includes additional excavation and hauling required to produce contract volumes.
4. 450 mm Thick Cover Fill:
  - a. Schedule of Prices Item No. 31 23 23/4.
  - b. Measurement Basis: By cubic metre as measured by survey methods measured immediately prior to placement and immediately following placement.

- e. Payment Basis: Unit Price. Includes excavating, loading, hauling common fill (or waste for final cover subgrade only), temporary stockpiling, placing, grading, and testing.
- 5. Common fill for berms for mid-slope swales and letdown ditches.
  - a. Paid for separately under Section 31 23 16.
- 6. Sand for landfill gas venting system and culverts
  - a. Paid for separately under respective Sections 02 66 13 and 33 42 13, respectively.
- 7. Select 50 mm minus for manholes
  - a. Paid for separately under 33 05 13.

### 1.3 REFERENCES

#### A. Definitions:

- 1. MMDD: Modified Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D1557.
- 2. SMDD: Standard Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D698.

#### B. Reference Standards:

- 1. ASTM International:
  - a. ASTM C117 - Standard Test Method for Materials Finer than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing.
  - b. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - c. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils.
  - d. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - e. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - f. ASTM D2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
  - g. ASTM D2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications
  - h. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
  - i. ASTM D6913 - Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
  - j. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

### 1.4 SEQUENCING AND SCHEDULING

- A. Coordinate and sequence excavation and aggregate production to ensure efficient production of the required products from the on-site sand and gravel source.
- B. Coordinate and sequence excavation operations to minimize temporary stockpiling of excavated materials until required for backfilling. Make every effort to balance cut and fill operations and ensure excavated material designated for backfill is immediately placed in the Works. Minimize time excavations remain open. Stockpile excess material in suitable stockpile location on Site for future use.

- C. Do not allow or cause work performed to be covered up or enclosed prior to required inspections, tests, or approvals.

#### 1.5 SUBMITTALS

- A. Materials Source: Submit name of proposed imported fill material source at least 14 days prior to commencing transport of materials to the Site or produce fill material on-site.
- B. Geotechnical Data: Submit geotechnical data for Source Quality Control at least seven days prior to commencing transport to the Site or loading and hauling on-site materials. Submit Field Quality Control prior to placing subsequent layers of Materials or Products and at least seven days following field testing. Refer to Part 3.6 Source Quality Control and Part 3.7 Field Quality Control for testing requirements.
- C. Qualification Statements:
  - 1. Independent Geotechnical Testing Firm: At least 14 days prior to commencing transport of soil materials from source, including on-site transport, submit name and qualifications of independent geotechnical testing firm to provide geotechnical testing services for work of this Section.
  - 2. Independent Analytical Laboratory: At least 14 days prior to commencing transport of soil or aggregate materials from source, excluding on-site transport, submit name and qualifications of independent testing laboratory to provide chemical analysis for work of this Section.

#### 1.6 QUALIFICATIONS

- A. Geotechnical Testing Firm: Company specializing in performing work of this Section and complying with ASTM D3740 to perform testing of fill materials including density, moisture content, permeability, and particle size analysis for both soil and aggregate samples.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and transport fill materials in a manner and with equipment that will prevent intermixing of soil, aggregate, segregation, or contamination.
- B. Minimize stockpiling requirements. Transport material from source directly to final position where possible.
- C. Stockpile fill materials in on-Site locations approved by Engineer.
- D. Additional material borrows locations approximately as shown in Drawings or as approved by Engineer.

#### 1.8 AMBIENT CONDITIONS

- A. Suspend operations whenever climatic conditions are unsatisfactory for placing fill to the requirements of this Section.
- B. Do not operate equipment on approved excavations after heavy rain until material has dried sufficiently to prevent excessive rutting.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Native and imported from an approved source.
- B. Produced through crushing and screening of material excavated from on-site sand and gravel deposit.
- C. Free of unsuitable materials including:
  - 1. Frozen material or material containing snow or ice.
  - 2. Trees, stumps, branches, roots, or other wood or lumber.
  - 3. Wire, steel, cast iron, cans, drums, or other foreign material.
  - 4. Materials containing hazardous or toxic constituents at hazardous or toxic concentrations.
- D. Compactable to specified density at specified moisture content.

### 2.2 COMMON FILL FOR FINAL COVER SUBGRADE

- A. For Final Cover subgrade.
- B. Waste or native material meeting the requirements in Paragraph 2.1. Except as noted below:
  - 1. Trees, stumps, branches, roots or other wood or lumber may be placed on landfill plateau if covered with Common Fill or Sand Cushion Layer.
  - 2. Wire, steel, cast iron, cans, drums, or other foreign material may be placed on landfill plateau if excavated from waste grading activities.

### 2.3 SAND CUSHION LAYER FOR FINAL COVER SUBGRADE (IF REQUIRED)

- A. For covering protection of Geosynthetic Clay Liner (GCL)
- B. Select native material from the on-site North Borrow Area of the stockpile near site entrance and meeting requirements in Paragraph 2.1.

### 2.4 COVER FILL FOR ROOTING ZONE

- A. For Final Cover rooting zone/frost protection layer.
- B. Select native material from the on-site North Borrow Area of the stockpile near site entrance and meeting requirements in Paragraph 2.1.
- C. No boulders greater than 150 mm diameter.

### 2.5 COVER FILL FOR BERMS

- A. For construction of berms for mid-slope, letdown, and bypass ditches.
- B. Select native material from the on-site North Borrow Area of the stockpile near site entrance and meeting requirements in Paragraph 2.1.



C. No boulders greater than 150 mm diameter.

2.6 CLEAR CRUSH GRAVEL

A. For drainage layer in Final Cover.

B. Screened and processed from on-site North Borrow Area. No angular stones.

C. Uniformity Coefficient ( $D_{60}/D_{10}$ ): Less than 4.

D. Gradation:

ASTM Sieve Size	Maximum Percent Passing By Weight
75 mm	100
50 mm	0-100
25 mm	0-50
19 mm	0-25
9.5 mm	0-1
0.075 mm	0

2.7 SELECT 50 MM MINUS

A. For landfill access road over final cover and for compacted granular base below manholes.

B. Screened from on-site North Borrow Area.

C. Pit run stone, free of shale, friable material, and debris, graded within the following limits.

ASTM Sieve Size	Maximum Percent Passing By Weight
50 mm	0-100
25 mm	0-100
0.075 mm	0-5

2.8 SAND FOR LANDFILL GAS VENTS

A. For use in landfill gas venting strips, as per Drawings.

B. Screened from on-site North Borrow Area.

C. Coarse Sand screened from on-site borrow pit with the following gradation:

ASTM Sieve Size	Maximum Percent Passing By Weight
12.5 mm	100
4.75 mm	35-100
2.36 mm	0-70
0.075 mm	0-6

- D. Or approved equal material with coarser gradation than provided above, and grade-able for placement of landfill gas vent strips.

## 2.9 PIPE BEDDING MATERIAL

- A. For use around culverts and stormwater pipes.
- B. Screened from on-site North Borrow Area.
- C. According to manufacturer's recommendations or in accordance with ASTM D2321.
- D. ADS N-12 WaterTite allows for Class 1, 2 or 3 in accordance with ASTM 2321. Refer to Table 5-2 on Page 5-10 of the ADNS, Inc. Drainage Handbook [https://ads-pipecanada.ca/pdf/ca\\_en/ADH5-Installation.pdf](https://ads-pipecanada.ca/pdf/ca_en/ADH5-Installation.pdf)

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that survey benchmarks and intended elevations for the Works are as shown on the Drawings.

### 3.2 PREPARATION

- A. Locate, identify, and protect utilities that remain from damage. Confirm locations of buried utilities and structures by careful test excavations or other suitable means. Provide support for aboveground utility poles and lines.
- B. Identify required lines, levels, contours, and datum.
- C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- D. Maintain and protect existing utilities designated to remain.
- E. Obtain direction from Engineer before moving or otherwise disturbing utilities or structures.
- F. Protect benchmarks, survey control points, hydrants, existing structures, fences, paving, and curbs from excavating equipment and vehicular traffic.
- G. Maintain and protect from damage wells, utilities, and structures encountered.
- H. Protect existing structures where temporary unbalanced earth pressures may develop on walls or other structures utilizing bracing, shoring, or other approved method to counteract imbalance.

### 3.3 BACKFILLING

- A. Obtain approval from Engineer for completed excavations and previously placed material prior to placement of successive lifts of fill materials.
- B. Do not cause excavations to be backfilled until Engineer has approved excavation as complete. Complete field measurements for payment purposes, sampling and testing for analytical purposes.
- C. Obtain approval from Engineer prior to placing fill against structures or around exposed buried utilities.
- D. Remove debris or water from areas to be backfilled.
- E. Ensure areas to be backfilled are free from debris, snow, ice, water, soft soils, organic materials, or frozen ground.
- F. Proof roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.
- G. Cut out soft areas of subgrade not capable of compaction in place. Backfill with approved native fill and compact to density equal to or greater than requirements for subsequent fill material.
- H. Compact subgrade to density requirements for subsequent backfill materials.
- I. Backfill areas to contours and elevations. Use unfrozen and unsaturated materials.
- J. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- K. Place material in continuous layers as follows:
  - 1. Common Fill for Final Cover Subgrade and Sand Cushion Layer for Final Cover Subgrade: Place in lifts to required depth as shown on the Drawings in equal continuous layers not exceeding 300 mm compacted depth.
  - 2. Common Fill for general site grading (not otherwise identified): Place in lifts to required depth as shown on the Drawings in equal continuous layers not exceeding 300 mm compacted depth.
  - 3. Cover Fill for Rooting Zone: Place in minimum 300 mm lift using low-ground pressure equipment (less than 70 kPa).
  - 4. Cover Fill for Berms: Place in lifts to required depth as shown on the Drawings in equal continuous layers not exceeding 300 mm compacted depth.
  - 5. Clear Crush Gravel: Place in single lift not less than 200 mm thickness using low-ground pressure equipment (less than 70 kPa).
  - 6. Select 50 mm Minus and Pipe Bedding Material: Place in lifts to required depth as shown on the Drawings in equal continuous layers not exceeding 150 mm compacted depth.
  - 7. Sand for Landfill Gas Vents: Place in lifts to required depth as shown on the Drawings in equal continuous layers not exceeding 300 mm compacted depth.
- L. Employ placement method so not to disturb or damage other work.
- M. Maintain optimum moisture content of backfill materials to attain required compaction density in accordance with PART 3, COMPACTION.

- N. Make gradual grade changes. Blend slope into level areas.
- O. Compact each layer to the density specified before placing succeeding layers.

### 3.4 COMPACTION

- A. Common Fill for Berms: Compact to 95 percent SMDD.
- B. Clear Crush Gravel and Cover Fill for Rooting Zone: Do not compact.
- C. Select 50 mm Minus and Pipe Bedding Material: Compact to 98 percent SMDD or according to manufacturer's recommendations.
- D. Sand for Landfill Gas Vents: Compact according to manufacturer's recommendations.
- E. Apply potable water as necessary during compaction to obtain specified density. If material to be compacted is excessively moist, aerate with suitable equipment and method until moisture content is corrected. In areas not accessible to rolling equipment, compact material to specified density using mechanical tamper. Supply and pay for water.
- F. When granular material is wetted by sprinkling, do not direct jets of water at fill with such force that finer materials will be washed out.
- G. Compaction Equipment: Use type, size, and efficiency of compaction equipment capable of achieving specified degree of compaction. When operating equipment adjacent to and immediately above structures, avoid causing damage or displacement of structure.

### 3.5 TOLERANCES

- A. Top Surface of Backfilling: Achieve grades and thicknesses shown on Drawings  $\pm 25$  mm.

### 3.6 SOURCE QUALITY CONTROL

- A. Testing and Analysis of Source (including on-site source and post-processing/screening):
  - 1. Common Fill for Final Cover Subgrade:
    - a. No testing for using on-site materials.
  - 2. Common Fill for general site grading (not otherwise identified)
    - a. Berm construction only: Maximum dry density and optimum moisture content will be determined in the laboratory according to ASTM D698: One Sample per 1,000 m<sup>3</sup> or portion thereof of material required.
    - b. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
  - 3. Sand Cushion Layer for Final Cover Subgrade, Cover Fill for Rooting Zone, and Cover Fill for Berms:
    - a. Berm construction only: Maximum dry density and optimum moisture content will be determined in the laboratory according to ASTM D698: One Sample per 1,000 m<sup>3</sup> or portion thereof of material required.
    - b. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
  - 4. Clear Crush Gravel:

- a. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
  - b. Photographs of representative sample and assessment of angularity.
  5. Select 50 mm Minus:
    - a. Maximum dry density and optimum moisture content will be determined in the laboratory according to ASTM D698: One Sample per 1,000 m<sup>3</sup> or portion thereof of material required.
    - b. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
  6. Sand for Landfill Gas Vents:
    - a. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
  7. Pipe Bedding Material:
    - a. Maximum dry density and optimum moisture content will be determined in the laboratory according to ASTM D698: One Sample per 1,000 m<sup>3</sup> or portion thereof of material required.
    - b. Grain Size, ASTM C117 and C136: One sample per 5,000 m<sup>3</sup> or portion thereof of material required.
- B. If tests indicate materials do not meet specified requirements, change material, screening/processing equipment, or material source and retest.
- C. Provide materials of each type from the same source throughout the Works.
- D. In the event of changes to approved sources of materials during performance of the Works, immediately advise Engineer of revised locations and obtain approval of such locations and materials prior to use in the Works.
- E. Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

### 3.7 FIELD QUALITY CONTROL

- A. Testing by Contractor:
1. Perform tests in the field and/or in the laboratory on samples of backfill to determine if materials meet specification.
- B. Testing by Engineer:
1. Engineer may select samples of uncompacted fill intended for the Works and samples of compacted fill in the Works.
  2. Engineer may perform quality assurance tests in the field and in the laboratory on samples of backfill and imported fill to determine if materials meet specification. Quality assurance testing may include analysis for moisture content determination, bulk wet density, and maximum dry density.
  3. Testing by Engineer will in no way relieve Contractor of responsibility to test all material prior to notifying Engineer of materials' suitability for the work involved.
- C. Methods and Frequency of Testing:
1. At least one in-place density and moisture, ASTM 6938, for each lift for each 1,000 m<sup>2</sup> of area (100 m grid) for:
    - a. Cover Fill for Berms
    - b. Clear Crush Gravel

- c. Select 50 mm Minus:
- d. Pipe Bedding Material:

D. Failure to Meet Specified Requirements: If tests indicate that material specifications have not been achieved or cannot be obtained with equipment in use, procedure being followed, or material being incorporated, remove and replace work and modify operations so that equipment, procedures, and materials will produce required results.

E. Proof roll compacted fill surfaces under slabs on grade and around structures.

### 3.8 ADJUSTING

A. Finish compacted soil surfaces to within tolerance of grades shown on the Drawings but not uniformly high or low. Correct surface irregularities by loosening and adding or removing material until the surface is within specified grade.

B. Leave work areas in a properly graded condition sloped as required to permit proper drainage and free of depressions that will pond or collect water or debris that will restrict flow.

### 3.9 CLEANING

A. Clean and reinstate work areas and areas affected by equipment outside areas specified to be excavated, to specified restoration condition.

B. Upon completion of backfilling, remove excess material and debris from work areas and travel routes.

### 3.10 PROTECTION

A. Reshape and re-compact fills subjected to vehicular traffic.

B. Material borrow areas shall have a maximum finished slope of 2.5 H:1V.

END OF SECTION

## SECTION 31 25 00

### EROSION AND SEDIMENTATION CONTROLS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Flexamat for ditch armouring.
- B. Related Requirements:
  - 1. Section 31 10 00 - Site Clearing.
  - 2. Section 31 23 16 - Excavation.
  - 3. Section 31 23 23 - Fill.
  - 4. Section 33 42 13 - Pipe Culverts.

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 2. Flexamat Plus Channel Lining (15.5' / 4.7 m Width Roll):
    - a. Schedule of Prices Item No. 31 25 13/1.
    - b. Measurement Basis: By linear metre measured in place by CONTRACTOR's survey methods.
    - c. Payment Basis: Unit price. Includes supply and installation of concrete reinforcement matting over prepared letdown ditches, mid-slope inlets, and energy dissipater manhole outlet (6 m length), U-anchors, anchoring, overlaps, surveying, repairs, and inspections.

##### 1.3 REFERENCES

- A. Reference Standards:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for references.
  - 2. ASTM International:
    - a. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
    - b. ASTM D6475 - Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets.

##### 1.4 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Coordinate installation of matting with surface preparation work and installation of structures which will penetrate the matting.

## 1.5 PRE-INSTALLATION MEETING

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene 1 week prior to commencing installation of matting.
- C. Mandatory attendance includes: ENGINEER, CONTRACTOR and Subcontractor.
- D. Purpose of Meeting:
  - 1. Define the responsibilities of each party.
  - 2. Establish lines of authority and lines of communication.
  - 3. Review the Site-specific quality assurance/quality control and monitoring procedures.
  - 4. Define the method of acceptance of the completed matting.
  - 5. Establish rules for writing on the matting (i.e., who is authorized to mark on the matting and in what colors).
  - 6. Review time schedules.
  - 7. Review applicable personal protective equipment and regulations.
  - 8. Review safety plan and procedures.
  - 9. Review panel layout and numbering system for panels, seams, and test Samples.
  - 10. Review methods of measuring production.
  - 11. Review procedures for incremental acceptance.
  - 12. Visit the Site for review of surface preparation, physical location of the Site, and Site access.
  - 13. Review critical design details.

## 1.6 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: No later than 14 days following the date of the Notice to Proceed, submit product data for all manufactured products and materials..
- C. Samples: A representative Sample at least 300 mm by roll width no later than 10 days prior to ordering if required by ENGINEER.
- D. Manufacturer's Instructions: Submit at least 14 days prior to installation.
- E. Daily Field Installation Report: Submit no later than 1 day following date covered by report. Include at a minimum:
  - 1. Total amount, type, and location of matting placed.
  - 2. Identifiers of rolls and fabricated blankets, Flexamat correlated with manufacturer's number.
  - 3. Quality control tests of materials used during the day.
  - 4. Changes in layout drawings.
  - 5. Reasons for and observations of repairs and retesting, including locations, type of repair, and name of repairer.
  - 6. Observations of anchor trench excavation, backfilling, and compaction.
- F. Layout Drawings: Drawings of the proposed matting placement pattern. Provide no later than 14 days prior to installation.
- G. Qualification Statements:



1. Installer: Submit a copy of the manufacturer's approval letter or license to ENGINEER no later than 14 days prior to installation.
2. Manufacturer: Submit no later than 14 days prior to retaining, list of previous projects totaling 3 million sq ft of installation, and five projects including name of project, description of project, area, client's name and address, contacts, and telephone numbers; engineer's name, address, contact, and telephone number; installer's name, address, contact, and telephone number; and date installed.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout submittals.
- B. Record Documents: Indicate layout, including panel identifiers.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Package and label matting rolls or blankets prior to shipment to the Site. Indicate manufacturer, type of matting, thickness, lot number, roll number, and roll dimensions.
- C. When transported to the Site, handle rolls by appropriate means as recommended by manufacturer so that no damage is caused.
- D. Take adequate measures to keep materials away from possible deteriorating sources (i.e., vandalism, theft).
- E. Use appropriate handling equipment when moving rolled or folded matting from one place to another.
- F. Notify ENGINEER 3 days in advance of matting delivery to the Site. Perform joint inspection with ENGINEER upon delivery. Defects or damage from shipping and handling will be grounds for rejection of a portion of matting or of the entire matting roll at the discretion of ENGINEER. Remove roll from the Site and replace with new material.

#### 1.9 AMBIENT CONDITIONS

- A. Install matting according to manufacturer's instructions.
- B. Suspend installation operations whenever climatic conditions, as determined by ENGINEER or manufacturer's representative, are unsatisfactory for placing matting to the requirements of this Section.
- C. Weather Conditions for Matting Placement:
  1. Comply with manufacturer's recommendation.
  2. Install on dry ground.

## PART 2 PRODUCTS

### 2.1 FLEXAMAT PLUS

- A. Flexamat Plus, as supplied by Brock White (which includes Flexamat manufactured by Motz Enterprises Inc. with a Brock White-specified TRM) or approved equivalent.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 70 00 - Execution Requirements: Verification of existing conditions before starting work.
- B. Obtain ENGINEER's approval of surfaces, in writing, prior to installation of matting.

### 3.2 PREPARATION

- A. Ensure surface is free from exposed rocks and protrusions.
- B. Do not place matting on areas softened by rainfall and which will not support equipment.

### 3.3 INSTALLATION

- A. Install Flexamat according to manufacturer's instructions.
- B. Place individual sheets and/or strips side by side without gaps.
- C. Lay smooth and free of tension, stress, folds, wrinkles, or creases.
- D. Anchor the outside edge of all matting within a 150 mm deep trench and anchor with staples according to manufacturer's instructions.

### 3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting and testing.
- B. Inspect Flexamat in place for tears, overlaps, and consistency. Repair or replace improperly placed sections, as judged by ENGINEER, as directed by ENGINEER.
- C. Survey limits of matting installed and submit as-recorded information to ENGINEER upon completion or as requested.

### 3.5 MAINTENANCE

- A. Maintain the Flexamat in a functional condition at all times.

- B. Make periodic inspections of Flexamat for effectiveness and immediately correct deficiencies.
- C. Where deficiencies exist, install additional material immediately.

END OF SECTION

SECTION 32 92 19  
TOPSOIL AND SEEDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Topsoil.
  - 2. Fertilizing.
  - 3. Seeding.
  - 4. Hydroseeding.
  - 5. Mulching.
  - 6. Maintenance.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. 150 mm Thick Organic Layer and Hydroseeding:
    - a. Schedule of Prices Item No. 32 92 19/1.
    - b. Measurement Basis: By square metre.
    - c. Payment Basis: Unit price. Includes preparation of subgrade, supply, placing, soil analysis, and grading topsoil (organic layer), hydroseeding, fertilizing, soil amendments, mulching, and maintenance until vegetation growth established, and inspections.

1.3 REFERENCES

- A. Definitions:
  - 1. Weeds: Vegetative species other than specified species to be established in given area.
- B. Reference Standards:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for references.
  - 2. ASTM International:
    - a. ASTM C602 - Standard Specification for Agricultural Liming Materials.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.
- C. Seed Certificates: At least 14 days prior to seeding submit certificates from seed vendors for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.
- D. Fertilizer Certificate: At least 14 days prior to placing fertilizer, submit certificate confirming conformance with recommendations provided by laboratory based on topsoil analysis.

- E. Topsoil Source: At least 14 days prior to commencing transport to the Site, submit name of proposed imported topsoil source.
- F. Test Results: At least 14 days prior to commencing transport to the Site, submit test results of imported topsoil. Indicate, by test results, information necessary to determine suitability, including but not limited to, organic content, pH, phosphorus, potassium, calcium, and magnesium; and laboratory or supplier recommendation for fertilizer application rate for specified seed mixture. Analytical results for screening contamination for use in industrial applications (IL). Typical tests include LEPH, HEPH, and total metals.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout submittals.
- B. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height, types, application frequency, and recommended coverage of fertilizer.

#### 1.6 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.
- B. Perform work of this Section according to BCMOTSS Section 757, Revegetation Seeding.
- C. Regulatory Requirements: Comply with regulatory agencies for fertilizer and herbicide composition.

#### 1.7 QUALIFICATIONS

- A. Seed Supplier: Established vendor capable of provided adequate seed quality and quantities.
- B. Fertilizer Supplier: Established vendor capable of providing adequate fertilizer quality and quantities.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

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## PART 2 PRODUCTS

### 2.1 TOPSOIL

- A. For use in Final Cover and restoration of surface water management infrastructure.
- B. Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from the drained Site; free of subsoil, clay or impurities, plants, weeds, and roots; pH value minimum of 5.4 and maximum of seven, organic content minimum of 5 percent and maximum of 20 percent.
- C. Topsoil may be sourced on site from stripping of vegetated areas free of waste or leachate impacts.

### 2.2 SEED MIXTURE

- A. Furnish materials according to BCMOTSS Section 757 - Revegetation Seeding.
- B. Grass Seed: Fresh, clean, new-crop seed harvested previous year complying with the tolerance for purity and germination established by the Canada Seed Act and Regulations, obtained from an approved seed house.
- C. Seed Mixture (Based on BCMOTSS Table 757.1, Northern (Terrace Area), North West Coastal Mix. "*General seeding coastal locations where mean annual precipitation is > 90 cm*"): 

Intermediate wheatgrass	52 percent
Kentucky bluegrass	12 percent
Hard Fescue/Sheep Fescue	27 percent
Timothy	9 percent
- D. Seed Application Rate: standard application unless otherwise specified by manufacturer:
  - 1. Grass seed mix: 75 kg/ha
  - 2. Nurse Crop Grass (when specified) Fall Rye 50 kg/ha, Annual Rye 25 kg/ha
- E. Weed Seed Content: Not over 0.25 percent and free of noxious weeds.

### 2.3 ACCESSORIES

- A. Mulching Material:
  - 1. Free of weeds and other foreign materials, free of growth or germination inhibiting ingredients; manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material will become uniformly suspended to form a homogeneous slurry; dyed a suitable colour to facilitate inspection of the placement of the material. When applied, capable of forming an absorptive mat, which will allow moisture to percolate into the underlying soil.
  - 2. Content: Mixture consisting of shredded newsprint, raw cotton fibre, and straw processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. The greater proportion of the ingredients of mulch shall be straw.
  - 3. Application rate: 1500 kg/ha or otherwise specified by manufacturer.

- B. Tackifier: An organic guar gum or starch-based product specifically designed for use in hydraulic mulching and seeding operations.
  - 1. Application rate: as specified by manufacturer.
- C. Fertilizer: Commercial grade; compliant with Canada Fertilizers Act and Regulations; recommended for grass, with 50 percent of the elements derived from organic sources; slow-release nitrogen type formulation; granular form, dry, free flowing, and free from lumps; of proportion necessary to eliminate deficiencies of topsoil, to the following proportions:
  - 1. Ratio: 22-11-11.
  - 2. Application rate: 300 kg/ha or otherwise specified by manufacturer.
- D. Water: Clean, fresh, and free of substances or matter capable of inhibiting vigorous growth of grass.

## 2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection, and analysis requirements.
- B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.
- D. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 70 00 - Execution Requirements: Verification of existing conditions before starting work.
- B. Verify that prepared soil base is ready to receive the work of this Section.

### 3.2 PREPARATION

- A. Prepare subgrade to eliminate uneven and low spots. Maintain lines, levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Scarify subgrade to a depth of 75 mm where topsoil and matting shall be placed.
- C. Remove surface debris, roots, vegetation, lumps, and stones in excess of 25mm.
- D. Do not place matting on areas softened by rainfall and which will not support equipment

### 3.3 PLACING TOPSOIL

- A. Spread topsoil as shown on Drawings.
- B. Spread to a minimum settled depth of 150 mm over areas to be seeded. Rake until smooth.
- C. Place topsoil during dry weather and on dry, unfrozen subgrade.
- D. Remove foreign non-organic material from topsoil while spreading.
- E. Grade topsoil to eliminate rough, low, or soft areas, and to ensure positive drainage.

### 3.4 HYDROSEEDING

- A. Hydroseeding shall be a 1-step process in which seed, fertilizer, hydraulic mulch, and tackifier are applied simultaneously in a water slurry via hydraulic seeder/mulcher.
- B. Apply fertilizer, mulch, seed, and tackifier slurry with hydraulic seeder at the specified rates.
- C. Hydraulic Seeder/Mulcher: Apply seed, fertilizer, hydraulic mulch, and tackifier using an acceptable hydraulic seeder/mulcher. The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogeneous slurry and maintaining the slurry in a homogeneous state until it is applied. The discharge pumps and gun nozzles shall be capable of applying the materials uniformly.
- D. Volume Certification: Hydraulic seeding/mulching equipment shall have the tank volume certified by a plate affixed by manufacturer and confirmed to ENGINEER by means of measurements or tests prior to the commencement of work. This plate shall be affixed in plain view on the hydraulic seeder/mulcher and shall not be removed or altered. The plate shall certify tank volume only, and shall imply equipment conformance to other requirements of this specification.
- E. Application of Materials: Measure the quantity of each material to be charged into the hydraulic seeder/mulcher tank either by mass or by a system of mass calibrated volume measurements acceptable to ENGINEER. Add the materials to the tank while it is being loaded with water. Thoroughly mix the materials into a homogeneous water slurry and distribute uniformly over the designated surface area via the hydraulic seeder/mulcher. Apply seed, fertilizer, mulch, and tackifier within 2 hours of being charged into the hydraulic seeder/mulcher tank.
- F. Blend into existing adjacent grass areas to bond new growth to existing adjacent areas to previous applications to form uniform surfaces.
- G. Hydroseeding shall overlap adjoining vegetation by 300 mm.

### 3.5 SEED PROTECTION

- A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for protecting installed work.
- B. Cover seeded slopes where grade is 3 horizontal to 1 vertical or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.



- C. Lay fabric smoothly on surface, bury top end of each section in 150 mm deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 300 mm. Backfill trench and rake smooth, level with adjacent soil.
- D. Secure outside edges and overlaps at 900 mm intervals with stakes.
- E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- F. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 150 mm.

### 3.6 MAINTENANCE

- A. Mow grass at regular intervals to maintain at maximum height of 65 mm. Do not cut more than a third of grass blade at each mowing. Perform first mowing when seedlings are 40 percent higher than desired height.
- B. Neatly trim edges and hand clip where necessary.
- C. Immediately remove clippings after mowing and trimming. Do not let clippings lay in clumps.
- D. Water to prevent grass and soil from drying out.
- E. Roll surface to remove minor depressions or irregularities.
- F. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.
- G. Immediately reseed areas showing bare spots.
- H. Repair washouts or gullies.
- I. Protect seeded areas with warning signs during maintenance period.
- J. Maintain seeded area for not less than the period stated below and longer, as required to establish an acceptable stand, as determined by ENGINEER:
  - 1. Not less than 60 days after last area seeded.
  - 2. If planted in fall and not given full 60 days of maintenance and/or if not considered acceptable by ENGINEER if planted in fall and/or at completion of 60 days, continue maintenance the following spring until acceptable vegetative cover is established.
- K. Maintain vegetative cover by watering, fertilizing, weeding, mowing, trimming, overseeding, and other operations such as rolling, regrading, and replanting as required to establish a continuous, stable and, acceptable vegetated soil cover, free of eroded or bare areas.
- L. Vegetative cover will be accepted by ENGINEER provided all requirements have been complied with, including completion of 60 day maintenance period, and the following.
  - 1. Vegetative cover is properly established.
  - 2. Turf is free of eroded, bare, or dead spots and 98 percent free of noxious weeds.
  - 3. No surface is visible when vegetative cover has been cut to a height of 100 to 125 mm.
  - 4. Immediately re seed areas which show signs of bare spots.

END OF SECTION

## SECTION 33 05 13

### MANHOLES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Precast concrete manholes for surface water let down pipe inlet and energy dissipator manhole.
- B. Related Requirements:
  - 1. Section 31 23 16 – Excavation.
  - 2. Section 31 23 23 – Fill.
  - 3. Section 33 42 13 – Pipe Culverts.

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Inlet Manhole:
    - a. Schedule of Prices Item No. 33 05 13/1:
    - b. Measurement basis: Each.
    - c. Payment Basis: Unit Price. Includes supply and installation, including excavating, bedding, backfilling, compactions, tie-ins and connections.
  - 2. Energy Dissipator Manhole:
    - a. Schedule of Prices Item No. 33 05 13/2:
    - b. Measurement basis: Each.
    - c. Payment Basis: Unit Price. Includes supply and installation, including excavating, bedding, backfilling, compactions, tie-ins and connections.

##### 1.3 REFERENCES

- A. Reference Standards:
- B. Section 01 40 00 - Quality Requirements: Requirements for references.
- C. ASTM International:
  - 1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
  - 2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 3. ASTM C478M - Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric).
  - 4. ASTM C497M - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile (Metric).
  - 5. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

- D. ASTM C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals (Metric).
- E. Master Municipal Construction Documents Association (MMCD):
  - 1. Section 33 44 01 - Manholes and Catchbasins.

#### 1.4 SUBMITTALS

- A. Section 01 33 00 - General Requirements: Requirements for submittals.
- B. Product Data: Submit cover and frame construction details, features, configuration, dimensions, strength, supplier.
- C. Shop Drawings: Indicate manhole and headwall locations, elevations, pipe connections, including sizes and elevations of penetrations and penetration seals. Indicate unit weight, dimensions, reinforcements, certified standards, and lifting procedures.
- D. Manufacturer's Certificate: Submit certification that precast units meet or exceed requirements of this Section a minimum 14 days in advance of delivery to Site.
- E. Manufacturer Data: Submit manufacturer's drawings and other pertinent data on specified materials minimum 14 days in advance of delivery to the Site.
- F. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures. Indicate joining methods.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Unload, store, and handle precast manhole and headwall according to manufacturer instructions. Handle precast units by purpose made lift eyes or holes.
- B. Storage:
  - 1. Store precast concrete manhole and headwall as to prevent damage to OWNER's property or other public or private property.
  - 2. Repair property damaged from materials storage.

### PART 2 PRODUCTS

#### 2.1 MANHOLE

- A. For use as Inlet Manhole and Energy Dissipator as shown on Drawings.
- B. Precast Concrete Access Manhole:
  - 1. In accordance with MMCD Section 33 44 01, Standard Detail Drawing S1, and all standards referenced therein.
  - 2. Dimensions as shown on the Drawings, reinforced precast concrete with ladder rungs, cast iron frame and cover suitable to withstand water loading.
  - 3. Pipe Openings: Smooth inside walls.
  - 4. Accessories: As shown on the Drawings.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify of existing conditions before starting work.
- B. Verify that items provided by other Sections of work are properly sized and located.
- C. Verify that built-in items are in proper location and ready for roughing into work.
- D. Verify correct size of manhole and headwall structure excavation.

### 3.2 PREPARATION

- A. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers as shown on the Drawings to indicate its intended use.
- B. Coordinate placement of inlet and outlet pipe required by other Sections.
- C. Do not install structures where Site conditions can induce loads exceeding structural capacity of structures.
- D. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage; remove and replace damaged units.

### 3.3 INSTALLATION

- A. Excavation and Backfill:
  - 1. Excavate for manhole and headwall structures as specified in Section 31 23 16 in location and to the indicated depth as shown on the Drawings.
  - 2. Provide clearance around sidewalls of structure for construction operations.
  - 3. When groundwater is encountered, prevent accumulation of water in excavations; place manhole and headwall structure in dry trench.
  - 4. Where possibility exists of watertight structure becoming buoyant in flooded excavation, anchor structure to avoid flotation as approved by ENGINEER.
- B. Base Pad:
  - 1. Place and compact granular base pad in accordance with the Drawings and Section 31 23 23
  - 2. Trowel top surface level.
- C. Place manhole sections and headwall structure plumb and level on base pad, trim to correct elevations.
- D. Backfill excavations for manhole and headwall structure as specified in Section 31 23 23.
- E. Form and place manhole and headwall structure plumb and level and to correct dimensions and elevations.

- F. Cut and fit for pipe.
- G. Set cover frames and covers level without tipping and to the correct elevations.
- H. Coordinate with other Sections of work to provide correct size, shape, and location.
- I. Precast Concrete Manhole Headwall Structures:
  - 1. Lift precast components at lifting points designated by manufacturer.
  - 2. When lowering manhole and headwall structure into excavations and joining pipe to units, take precautions to ensure that interior of pipeline and structure remains clean.
  - 3. Set precast structures bearing firmly and fully on base pad as shown on the Drawings, compacted as specified in Section 31 23 23.
  - 4. Assemble multi-section structures by lowering each section into excavation; set level and firmly position base section before placing additional sections.
  - 5. Remove foreign materials from joint surfaces and verify sealing materials are placed properly.
  - 6. Maintain alignment between sections by using guide devices affixed to lower section.
  - 7. Joint sealing materials may be installed on Site or at manufacturer's plant.
  - 8. Verify that installed manhole and headwall structure meet required alignment and grade.
  - 9. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe; fill annular spaces with mortar.
  - 10. Cut pipe flush with interior of structure.
  - 11. Shape inverts through manhole and headwall structure as shown on the Drawings.
  - 12. Seal connection with non-shrink grout or as approved by ENGINEER.

END OF SECTION

## SECTION 33 42 13

### PIPE CULVERTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Corrugated high density polyethylene (HDPE) pipe culvert.
  - 2. Bedding.
  - 3. Slope protection at pipe end.
- B. Related Requirements:
  - 1. Section 31 23 16 – Excavation.
  - 2. Section 31 23 23 – Fill.
  - 3. Section 33 05 13 – Manholes

##### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment:
  - 1. Section 01 20 00 - Price and Payment Procedures: Requirements for measurement and payment.
  - 2. 600 mm Diameter HDPE Profile Pipe Culvert:
    - a. Schedule of Prices Item No. 33 42 13/1.
    - b. Measurement Basis: By linear metre measured along the centerline of the pipe.
    - c. Payment Basis: Unit price. Includes hand trimming, excavating, removing soft subsoil, bedding fill, compacting, pipe installation, assembled fittings and accessories
  - 3. 900 mm Diameter HDPE Profile Pipe Culvert:
    - a. Schedule of Prices Item No. 33 42 13/2.
    - b. Measurement Basis: By linear metre measured along the centerline of the pipe.
    - c. Payment Basis: Unit price. Includes hand trimming, excavating, removing soft subsoil, bedding fill, anchoring for steep slopes, compacting, pipe installation, assembled fittings and accessories

##### 1.3 REFERENCES

- A. Definitions:
  - 1. MMDD: Modified Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D1557.
  - 2. SMDD: Standard Maximum Dry Density and in the context of this Contract means the maximum dry unit weight determined according to ASTM D698.
- B. Reference Standards:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for references.
  - 2. ASTM International:
    - a. ASTM D3350-21 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

- b. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- c. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
- d. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- 3. Canadian Standards Association (CSA)
  - a. CSA B 812.8 Standard Water Tight Joint

#### 1.4 PRE-INSTALLATION MEETING

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene 1 week prior to commencing work of this Section.

#### 1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information regarding pipe, fittings, and accessories.
- C. Manufacturer Instructions: Submit special procedures required to install specified products.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### PART 2 PRODUCTS

#### 2.1 PLASTIC CULVERT PIPE

- A. Polyethylene Culvert Pipe:
  - 1. Dual wall corrugated HDPE Culvert Profile Pipe with smooth interior wall 600 mm and 900 mm nominal diameter
- B. Manufacturers:
  - 1. ADS Pipe Canada
- C. Products:
  - 1. Corrugated HDPE Profile Pipe with Smooth Interior: N-12 WT (Water-Tite), or approved equal.
  - 2. Manhole Penetrations: SaniTite HP Manhole Adapter or approved equal.
  - 3. Fittings as required for grade changes.



## 2.2 MATERIALS

- A. Bedding:
  - 1. Bedding: Pipe Bedding as specified in Section 31 23 23 Fill.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Verification of existing conditions before starting work.
- B. Verify that excavation base is ready to receive work and excavations, dimensions, and elevations are as shown on the Drawings.
- C. Verify items provided by other Sections are properly sized and located.

### 3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation according to Section 31 23 16 and Section 31 23 23.
- B. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

### 3.3 INSTALLATION

- A. Excavation and Bedding:
  - 1. Excavate culvert trench to below pipe invert, and as specified in Section 31 23 16.13.
  - 2. Hand trim excavation for accurate placement of piping to indicated elevations.
  - 3. Place bedding material at trench bottom.
- B. Culvert:
  - 1. Positioning:
    - a. Lift or roll culvert into position; do not drop or drag culvert over prepared bedding.
    - b. Shore culvert to required position, and retain in place until after compaction of adjacent fills.
    - c. Ensure that pipe remains in correct position and to required slope.
  - 2. Repair surface damage to pipe protective coating with two coats of compatible bituminous paint coating.
  - 3. Backfilling and Compaction:
    - a. As specified in Section 31 23 23.
    - b. Level fill materials in continuous layers not exceeding 150 mm in depth, and compact as specified by manufacturer.
    - c. Do not displace or damage pipe while compacting.
    - d. Install cover at sides and over top of pipe.
    - e. Install cover to minimum compacted thickness of 300 mm, and compact to as specified by manufacturer.
    - f. Maintain optimum moisture content of bedding material to attain required compaction density.

4. Install culvert end gratings.

C. Pipe Ends:

1. Place fill at pipe ends, and at embankment slopes, as shown on the Drawings.
2. Level fill materials in continuous layers not exceeding 150 mm in depth, and compact to 95 percent SMDD.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting and testing.

B. Inspection: Request inspection from ENGINEER prior to placing aggregate cover over pipe.

C. Compaction Testing:

1. Comply with ASTM D6938.
2. If tests indicate that work does not meet specified requirements, remove work, replace, and retest.
3. Testing Frequency: in accordance with Section 31 23 23.

3.5 PROTECTION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protection of installed work.

B. Protect pipe and bedding from damage or displacement until backfilling operation is in progress.

C. Prevent debris from entering system.

END OF SECTION

# Drawings

# THE CITY OF TERRACE TERRACE LANDFILL PHASE 2 MSW CLOSURE

MARCH 2023  
12573433



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138 East 7<sup>th</sup> Avenue, Suite 100  
Vancouver British Columbia V5T 1M6 Canada  
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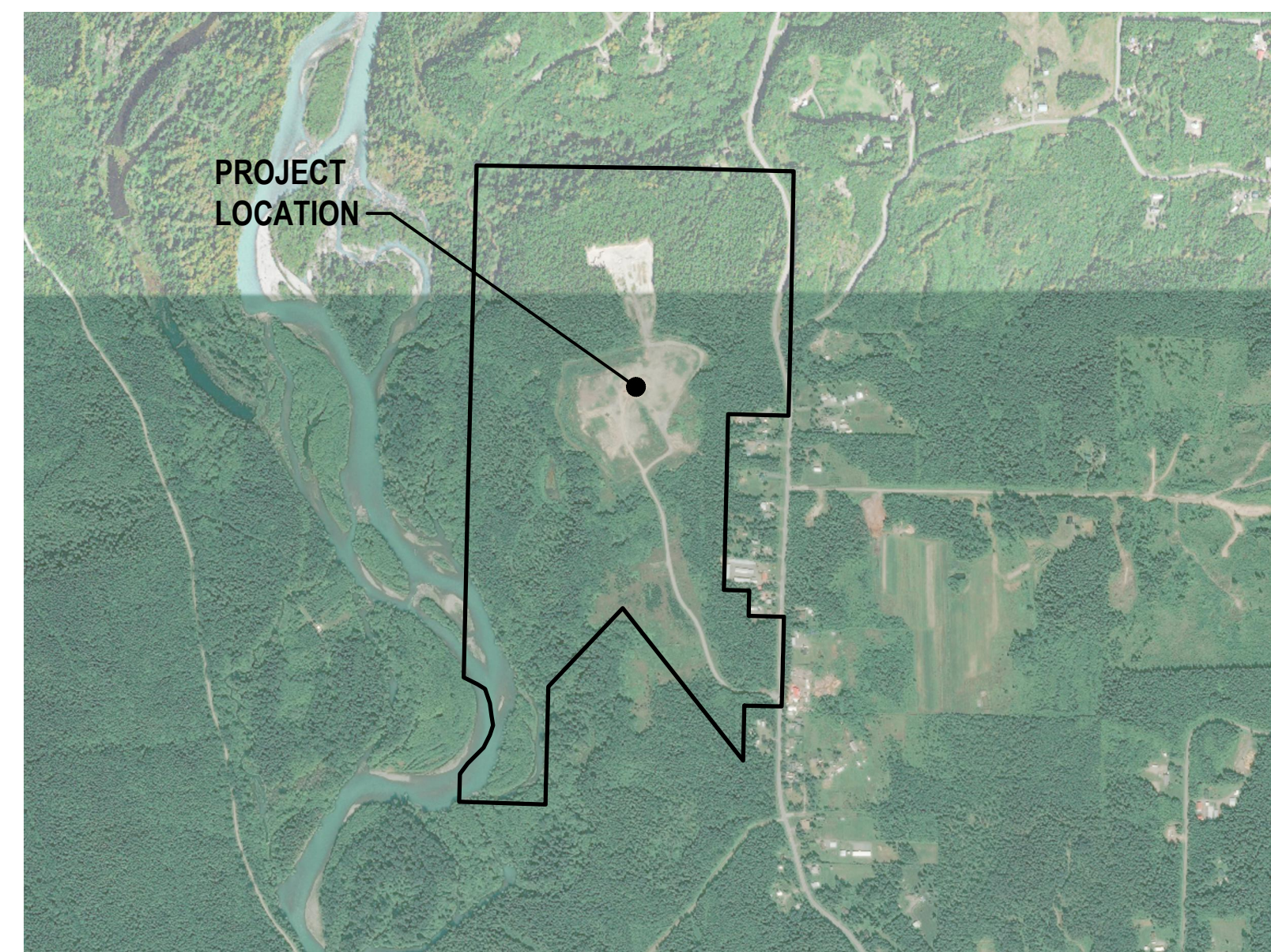
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**PERMIT TO PRACTICE**  
GHD LIMITED  
RR SIGNATURE: *[Signature]*  
RR EGBC ID #: 184209  
DATE: 6-Mar-23  
**PERMIT NUMBER: 1002509**  
Engineers and Geoscientists British Columbia



**AREA MAP**



**LOCATION MAP**

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
GN-0001	COVER AND DRAWING INDEX
CI-0101	EXISTING CONDITIONS
CI-0102	SITE PREPARATIONS PLAN
CI-0103	FINAL COVER GRADING PLAN - SUBGRADE
CI-0104	FINAL COVER GRADING PLAN - CUT/FILL TO SUBGRADE
CI-0105	SURFACE WATER MANAGEMENT
CI-0106	LANDFILL GAS VENTING SYSTEM
CI-0107	FINAL CONDITIONS
CI-0501	CROSS-SECTIONS A-A' & B-B'
CI-0502	DETAILS I
CI-0503	DETAILS II
CI-0504	DETAILS III

NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-

No.	ISSUED FOR TENDER	M.P.	D.E.	03/06/2023
No.	Issue	Checked	Approved	Date
Author	T. WAGSTAFF	Designer	D. ENGSTROM	
Drafting Check	D. ENGSTROM	Design Check	M. PARKER	
Project Manager	D.ENGSTROM	Project Director	D.LIDDY	

Client  
**THE CITY OF TERRACE  
TERRACE LANDFILL**

Project  
**PHASE 2 MSW CLOSURE**

Date  
**FEBRUARY 3, 2022**

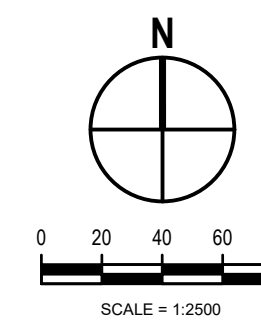
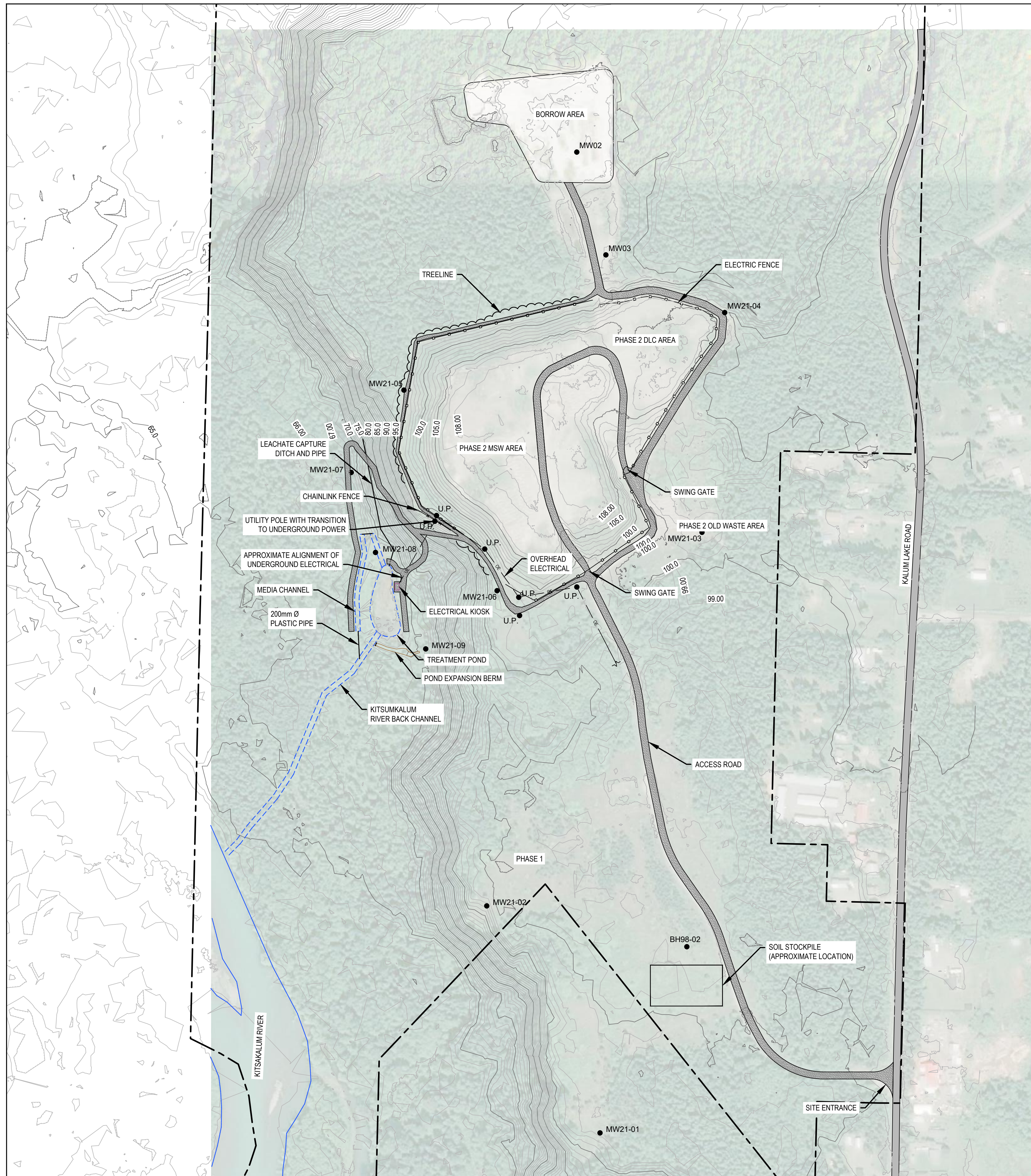
Project No.  
**12573433**

Title  
**COVER AND DRAWING INDEX**

Size  
**ANSI D**

**ISSUED FOR TENDER**

Sheet No.  
**GN-0001**



**LEGEND:**

- MAJOR CONTOUR (5m INTERVAL)
- MINOR CONTOUR (1m INTERVAL)
- - - - PROPERTY BOUNDARY
- ▬▬▬▬ FINAL COVER AREA
- PIPING
- — — — POND / CHANNEL
- x — x — x — CHAINLINK FENCE
- OE — — — OVERHEAD ELECTRICAL
- UE — — — UNDERGROUND ELECTRICAL
- ~~~~ TREE LINE
- ▬▬▬▬ SITE ACCESS ROUTE
- ▬▬▬▬ ROADWAY
- MW21-01 GROUNDWATER MONITORING WELL LOCATION
- U.P. UTILITY POLE LOCATION

**NOTE:**

1. MSW = MUNICIPAL SOLID WASTE, DLC = DEMOLITION AND LAND CLEARING
2. EXISTING CONDITIONS AND SITE FEATURES UPDATED DEC 2022 - SURVEY RECEIVED DEC-13-2022 FROM McELHANNEY
3. CONTRACTOR WILL BECOME PRIME CONTRACTOR FOR THE SITE WITHIN THE PROPERTY BOUNDARY SHOWN. LIMITS OF WORK ARE WITHIN THE PROPERTY BOUNDARY



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Author	T. WAGSTAFF	Designer	D. ENGSTROM
Drafting Check	D. ENGSTROM	Design Check	M. PARKER
Project Manager	D. ENGSTROM	Project Director	D. LIDDY

Client  
**THE CITY OF TERRACE**  
**TERRACE LANDFILL**

Project  
**PHASE 2 MSW CLOSURE**

Date  
**FEBRUARY 3, 2023**

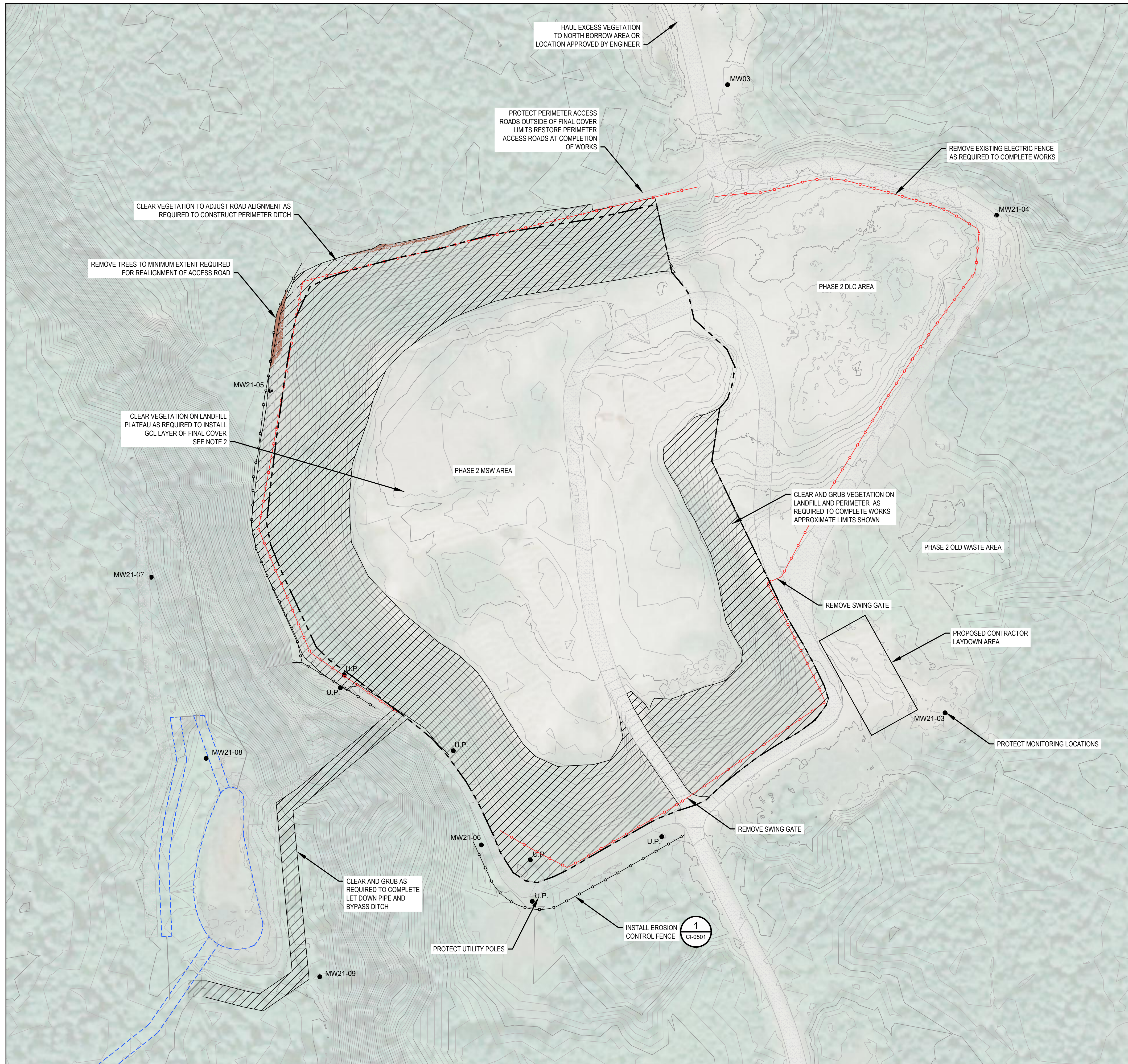
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Project No.  
**12573433**

Title  
**EXISTING CONDITIONS**

Sheet No.  
**CI-0101**

**ISSUED FOR TENDER**



N

**LEGEND:**

- EXISTING MAJOR CONTOUR (2.5m INTERVAL)
- EXISTING MINOR CONTOUR (0.5m INTERVAL)
- PROPERTY BOUNDARY
- FINAL COVER AREA
- PIPING
- POND / CHANNEL
- EXISTING ELECTRIC FENCE TO BE REMOVED
- ELECTRIC FENCE
- LIMIT OF FINAL COVER
- ACCESS ROADWAY
- CLEARING AND GRUBBING AREA
- TREE REMOVAL AREA
- MW21-01 GROUNDWATER MONITORING WELL LOCATION
- U.P. UTILITY POLE LOCATION

- NOTE:**
- PROTECT ALL UTILITY POLES AND MONITORING WELLS
  - CLEARED VEGETATION TO BE PLACED ON LANDFILL PLATEAU AND COVERED WITH MINIMUM SOIL 0.15m SOIL LAYER SEPARATION BELOW GCL OR OTHERWISE DIRECTED BY ENGINEER.
  - CONTRACTOR WILL BECOME PRIME CONTRACTOR FOR THE SITE WITHIN THE PROPERTY BOUNDARY SHOWN. LIMITS OF WORK ARE WITHIN THE PROPERTY BOUNDARY



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Drafting Check	D. ENGSTROM	Design Check	M. PARKER
Project Manager	D. ENGSTROM	Project Director	D. LIDDY

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**THE CITY OF TERRACE**  
**TERRACE LANDFILL**

Project  
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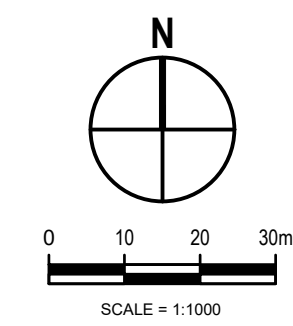
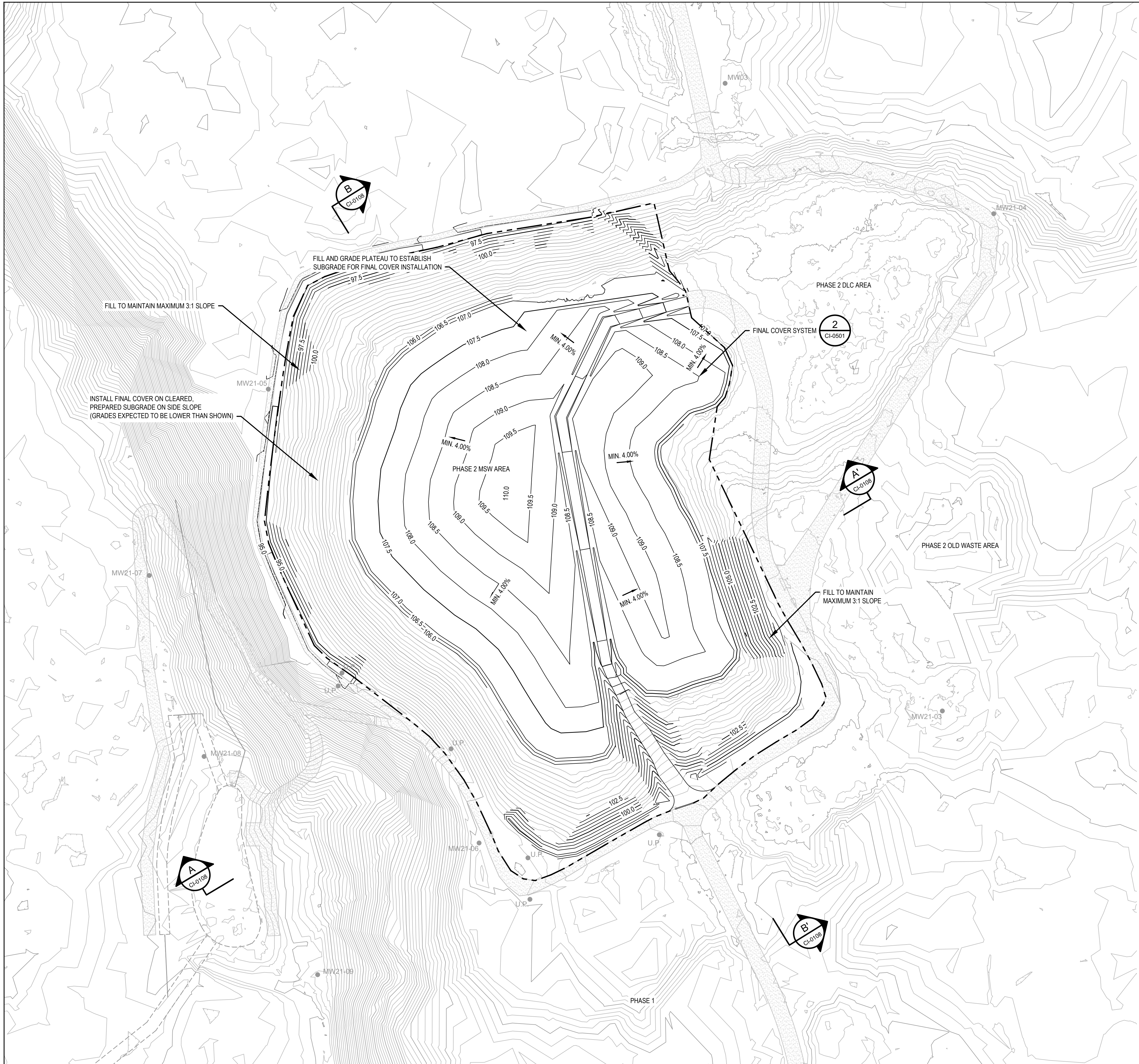
Date	FEBRUARY 3, 2023	Scale	AS SHOWN
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Project No.  
**12573433**

Title  
**SITE PREPARATIONS PLAN**

Sheet No.  
**CI-0102**

**ISSUED FOR TENDER**



**LEGEND:**

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- EXISTING MINOR CONTOUR (0.5m INTERVAL)
- 107.5 — TOP OF WASTE - MAJOR CONTOUR (2.5m INTERVAL)
- 108.0 — TOP OF WASTE - MINOR CONTOUR (0.5m INTERVAL)
- PROPERTY BOUNDARY
- - - - - FINAL COVER AREA
- PIPING
- - - - - POND / CHANNEL
- - - - - ELECTRIC FENCE
- ACCESS ROADWAY
- ▨ PERIMETER ROADWAY
- MW21-01 GROUNDWATER MONITORING WELL LOCATION
- U.P. UTILITY POLE LOCATION

**NOTE:**

1. SUBGRADES FOR SIDESLOPES SHOW VEGETATION. CONTRACTOR TO SMOOTH GRADING OF SIDESLOPES FOLLOWING CLEARING AND GRUBBING.
2. BACKFILL WITH COMMON FILL FROM BORROW SITE OR EXCAVATED WASTE/INTERIM COVER
3. CONTRACTOR WILL BECOME PRIME CONTRACTOR FOR THE SITE WITHIN THE PROPERTY BOUNDARY SHOWN. LIMITS OF WORK ARE WITHIN THE PROPERTY BOUNDARY



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Author **T. WAGSTAFF** Designer **D. ENGSTROM**

Drafting Check **D. ENGSTROM** Design Check **M. PARKER**

Project Manager **D.ENGSTROM** Project Director **D.LIDDY**

Client

**THE CITY OF TERRACE  
 TERRACE LANDFILL**

Project

**PHASE 2 MSW CLOSURE**

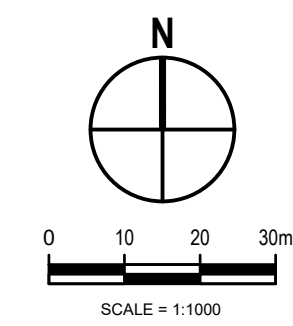
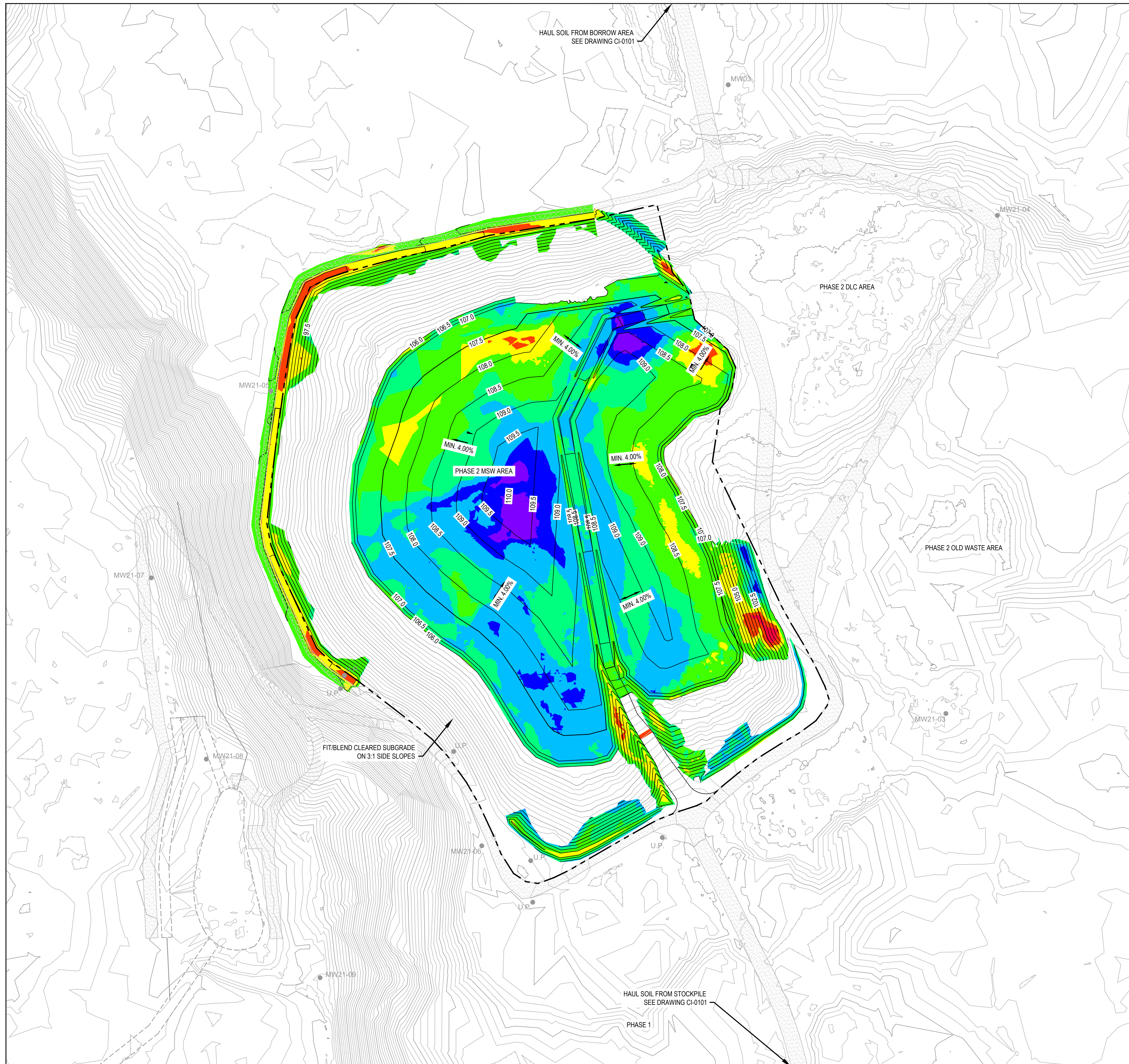
Date **FEBRUARY 3, 2023** Scale **AS SHOWN**

Project No. **12573433**

Title **FINAL COVER GRADING PLAN - SUBGRADE** Size **ANSI D**

**ISSUED FOR TENDER**

Sheet No. **CI-0103**



**LEGEND:**

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- EXISTING MINOR CONTOUR (0.5m INTERVAL)
- 109.5 — TOP OF WASTE - MAJOR CONTOUR (2.5m INTERVAL)
- 110.0 — TOP OF WASTE - MINOR CONTOUR (0.5m INTERVAL)
- - - - - PROPERTY BOUNDARY
- - - - - FINAL COVER AREA
- PIPING
- - - - - POND / CHANNEL
- ○ ○ ○ ○ ELECTRIC FENCE
- - - - - LIMIT OF FINAL COVER
- ▨ ACCESS ROADWAY
- ▨ PERIMETER ROADWAY
- MW21-01 GROUNDWATER MONITORING WELL LOCATION
- U.P. UTILITY POLE LOCATION

Levels Table				
No.	From Depth (m)	To Depth (m)	Colour	Depth Range Volume (m)
1	-1.900	-1.500	Red	9.5
2	-1.500	-1.000	Orange	129.1
3	-1.000	-0.500	Yellow	1207.3
4	-0.500	0.000	Light Green	5381.0
5	0.000	0.500	Green	9314.3
6	0.500	1.000	Blue	3554.9
7	1.000	1.500	Dark Blue	694.6
8	1.500	1.900	Purple	67.7

**VOLUME:**

CUT = 6,727 m<sup>3</sup>  
 FILL = 13,632 m<sup>3</sup>  
 NET (FILL) = 6,905 m<sup>3</sup>



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Drafting Check	D. ENGSTROM	Design Check	M. PARKER	
Project Manager	D. ENGSTROM	Project Director	D. LIDDY	

Client  
**THE CITY OF TERRACE  
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Project  
**PHASE 2 MSW CLOSURE**

Date  
**FEBRUARY 3, 2023** Scale  
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Project No.  
**12573433**

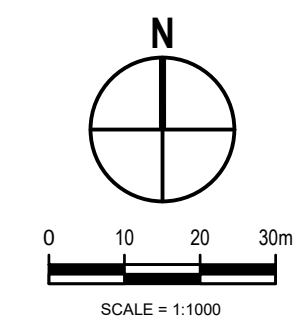
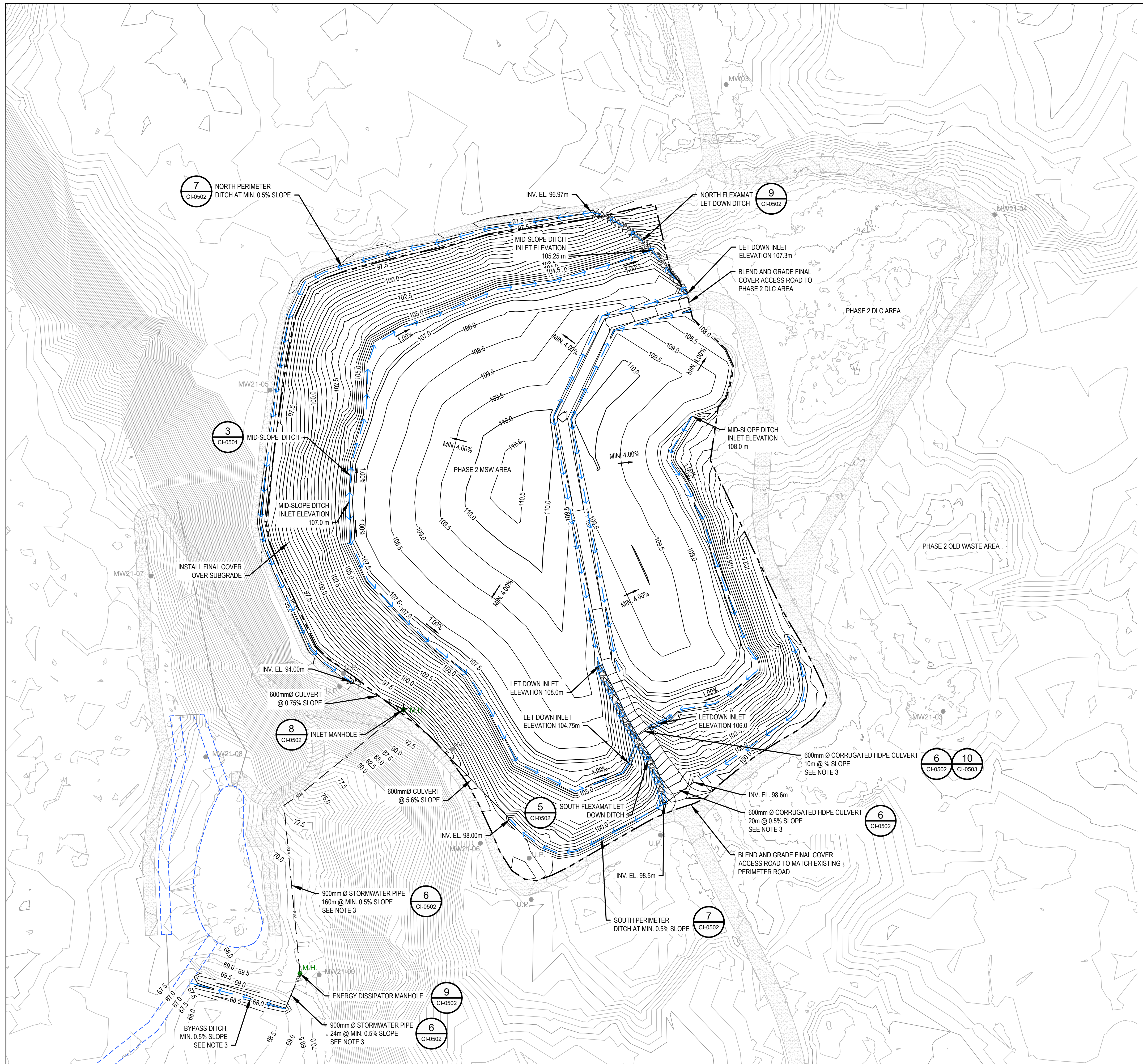
Title  
**FINAL COVER GRADING  
 PLAN - CUT/FILL TO  
 SUBGRADE**

Size  
**ANSI D**

**ISSUED FOR TENDER**

Sheet No.  
**CI-0104**





- LEGEND:**
- 100.0 — EXISTING MAJOR CONTOUR (5m INTERVAL)
  - 109.5 — EXISTING MINOR CONTOUR (1m INTERVAL)
  - 110.0 — TOP OF FINAL COVER - MAJOR CONTOUR (5m INTERVAL)
  - 110.0 — TOP OF FINAL COVER - MINOR CONTOUR (1m INTERVAL)
  - - - - - PROPERTY BOUNDARY
  - - - - - FINAL COVER AREA
  - STW — BELOW GRADE STORMWATER PIPING
  - — — — — PIPING
  - — — — — POND / CHANNEL
  - ← ← ← ← ← DITCH
  - — — — — ELECTRIC FENCE
  - - - - - LIMIT OF FINAL COVER
  - — — — — ACCESS ROADWAY
  - — — — — PERIMETER ROADWAY
  - — — — — FLEXAMAT LETDOWN DITCH
  - MW21-01 GROUNDWATER MONITORING WELL LOCATION
  - U.P. UTILITY POLE LOCATION
  - — — — — CULVERT
  - M.H. MANHOLE

- NOTE:**
1. STORMWATER PIPE ALIGNMENT IS APPROXIMATE. CONTRACTOR TO LAYOUT PROPOSED ALIGNMENT IN FIELD FOR REVIEW AND APPROVAL BY ENGINEER. ALIGNMENT SHALL BE ADJUSTED FOR MINIMAL DISTURBANCE TO TREES.
  2. BYPASS DITCH ALIGNMENT IS APPROXIMATE. CONTRACTOR TO CONSTRUCT DITCH ACCORDING TO DETAIL 10 WITH INLET AT ENERGY DISSIPATOR AND OUTLET AT KITSUMKALUM BACK CHANNEL. STORMWATER PIPE TO BE INSTALLED TO DEPTHS SHOWN ON DETAILS AND FOLLOW NATURAL LAND GRADES.



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Project Manager	D. ENGSTROM	Project Director	D. LIDDY	

Client  
**THE CITY OF TERRACE  
 TERRACE LANDFILL**

Project  
**PHASE 2 MSW CLOSURE**

Date  
**FEBRUARY 3, 2023**

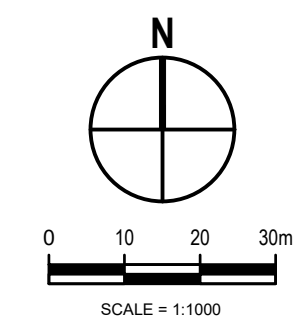
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Project No.  
**12573433**

Title  
**TOP OF FINAL COVER  
 GRADING AND SURFACE  
 WATER MANAGEMENT  
 PLAN**

**ISSUED FOR TENDER**

Sheet No.  
**CI-0105**



- LEGEND:**
- EXISTING MAJOR CONTOUR (2.5m INTERVAL)
  - EXISTING MINOR CONTOUR (0.5m INTERVAL)
  - 107.5 — TOP OF WASTE MAJOR CONTOUR (2.5m INTERVAL)
  - 108.0 — TOP OF WASTE MINOR CONTOUR (0.5m INTERVAL)
  - - - - - PROPERTY BOUNDARY
  - - - - - FINAL COVER AREA
  - PIPING
  - - - - - POND / CHANNEL
  - ← ← ← ← ← DITCH
  - ○ ○ ○ ○ ELECTRIC FENCE
  - - - - - LIMIT OF EXISTING FINAL COVER
  - ▭ ACCESS ROADWAY
  - ▭ PERIMETER ROADWAY
  - MW21-01 GROUNDWATER MONITORING WELL LOCATION
  - U.P. UTILITY POLE LOCATION
  - CULVERT
  - M.H. MANHOLE
  - VENT LANDFILL GAS VENT RISER PIPE
  - LANDFILL GAS STRIP



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NO.	-	-	-
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No.	Issue	Checked	Approved	Date
1	ISSUED FOR TENDER	M.P.	D.E.	03/06/2023

Author T. WAGSTAFF Designer D. ENGSTROM

Drafting Check D. ENGSTROM Design Check M. PARKER

Project Manager D. ENGSTROM Project Director D. LIDDY

Client

**THE CITY OF TERRACE**

**TERRACE LANDFILL**

Project

**PHASE 2 DETAILED CLOSURE PLAN**

Date

**FEBRUARY 3, 2023**

Scale

**AS SHOWN**

Project No.

**12573433**

Title

**LANDFILL GAS VENTING SYSTEM**

Sheet No.

**CI-0106**

Size

**ANSI D**

**ISSUED FOR TENDER**

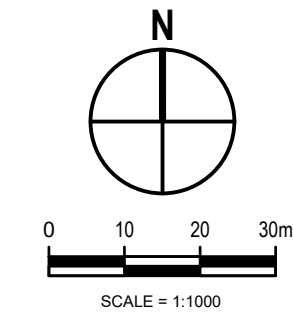


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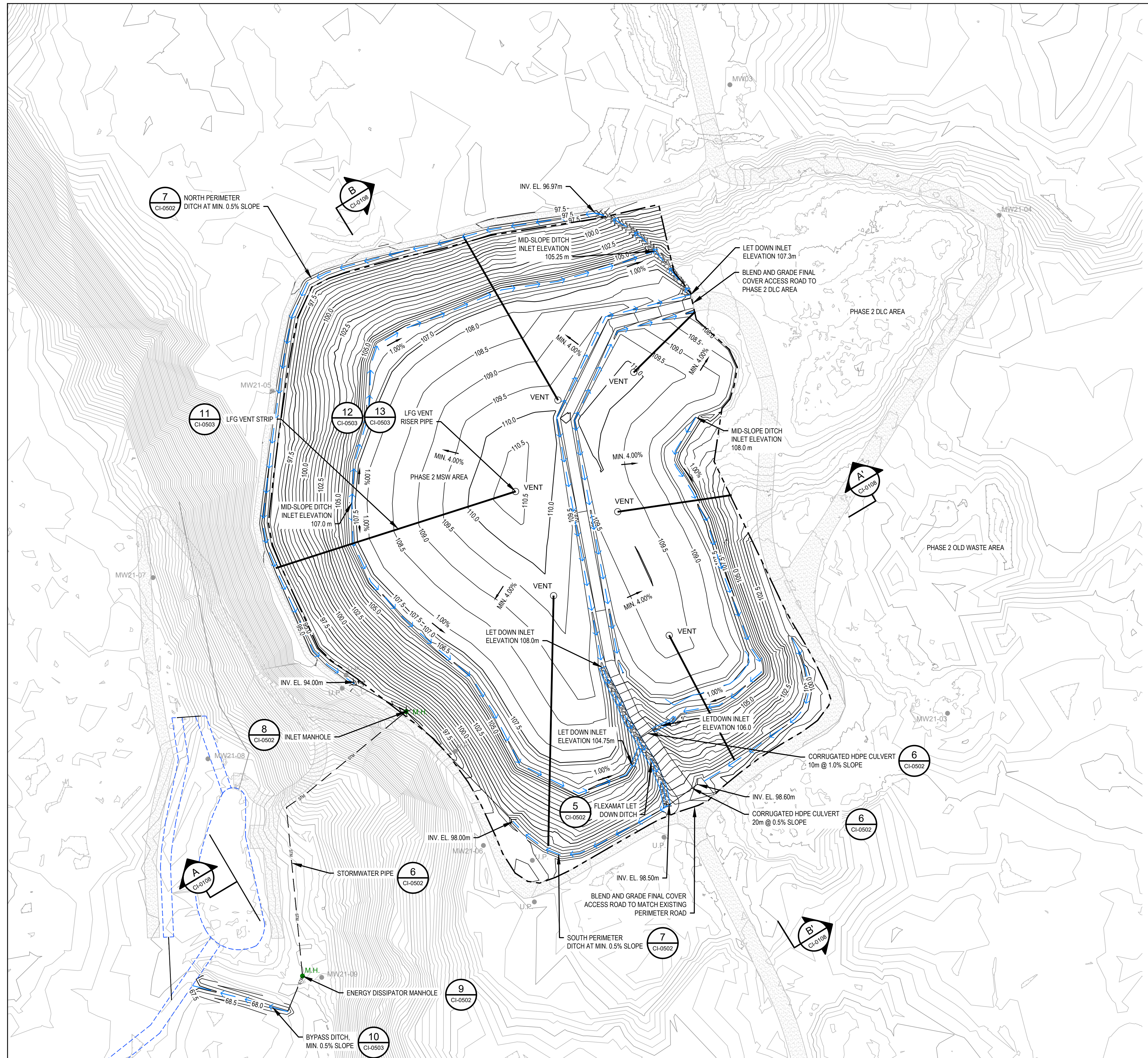
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- LEGEND:**
- 100.0 ——— EXISTING MAJOR CONTOUR (5m INTERVAL)
  - 109.5 ——— EXISTING MINOR CONTOUR (1m INTERVAL)
  - 110.0 ——— TOP OF FINAL COVER - MAJOR CONTOUR (5m INTERVAL)
  - 110.0 ——— TOP OF FINAL COVER - MINOR CONTOUR (1m INTERVAL)
  - PROPERTY BOUNDARY
  - FINAL COVER AREA
  - STM --- ABOVE GRADE STORMWATER PIPING
  - PIPING
  - POND / CHANNEL
  - ← ← ← ← ← DITCH
  - ELECTRIC FENCE
  - LIMIT OF FINAL COVER
  - ACCESS ROADWAY
  - PERIMETER ROADWAY
  - FLEXAMAT LETDOWN DITCH
  - MW21-01 GROUNDWATER MONITORING WELL LOCATION
  - U.P. UTILITY POLE LOCATION
  - > CULVERT
  - M.H. MANHOLE
  - VENT LANDFILL GAS VENT RISER PIPE
  - LANDFILL GAS STRIP

**SUMMARY OF WORK:**

1. PROJECT STARTUP INCLUDING DEVELOPMENT OF SITE STAGING AND EQUIPMENT STORAGE PLAN AND MOBILIZATION TO THE SITE.
2. DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN IN ACCORDANCE WITH WORKSAFEBC REQUIREMENTS.
3. PROVISIONING AND MAINTENANCE OF TEMPORARY FACILITIES AND CONTROLS.
4. INSTALLATION AND MAINTENANCE OF TEMPORARY EROSION AND SEDIMENT CONTROLS.
5. INSTALLATION OF PROTECTIVE FENCING, BARRIERS, AND FLAGS FOR OVERHEAD UTILITY POLES AND MONITORING WELLS.
6. SITE CLEARING AND GRUBBING OF LIMITS OF FINAL COVER AREA AND LOADING, HAULING, AND PLACING VEGETATION AT THE ON-SITE NORTH BORROW AREA OR OTHER AREAS APPROVED BY THE ENGINEER FOR FINAL RESTORATION.
7. EXCAVATION, PLACING, AND GRADING WASTE WITHIN THE PHASE 2 MSW FOOTPRINT TO ESTABLISH SUBGRADE FOR FINAL COVER INSTALLATION AND FOR EXCAVATION OF PERIMETER DITCHES.
8. EXCAVATION, LOADING, HAULING, AND PLACING, AND GRADING COMMON FILL, REFUSE, CLEARED VEGETATION EXCAVATED FROM THE ON-SITE NORTH BORROW AREA OR FROM THE SOIL STOCKPILE (NEAR ENTRANCE) TO ESTABLISH SUBGRADE FOR FINAL COVER INSTALLATION.
9. FINISH GRADING, REMOVAL OF STONES, COVERING OF CLEARED VEGETATION, AND INSTALLATION OF SAND CUSHION LAYER (WHERE REQUIRED) OF SUBGRADE IN PREPARATION FOR FINAL COVER INSTALLATION.
10. SUPPLY AND INSTALLATION OF LANDFILL GAS VENT STRIPS.
11. SUPPLY AND INSTALLATION OF LANDFILL GAS VENT RISER PIPE ASSEMBLY.
12. SUPPLY AND INSTALLATION OF GEOSYNTHETIC CLAY LINER (GCL) ON PREPARED SUBGRADE.
13. EXCAVATION, SCREENING, LOADING, HAULING, AND PLACING CLEAR CRUSH GRAVEL DRAINAGE LAYER.
14. SUPPLY AND INSTALLATION OF SEPARATION GEOTEXTILE LAYER.
15. EXCAVATION, LOADING, HAULING, AND PLACING, AND GRADING COVER SOIL EXCAVATED FROM THE NORTH BORROW AREA OR FROM THE SOIL STOCKPILE (NEAR ENTRANCE) FOR FINAL COVER (ROOTING ZONE AND FROST PROTECTION LAYER) AND BERMS FOR MID-SLOPE SWALES.
16. SUPPLY AND PLACEMENT OF TOPSOIL FOR FINAL COVER AND DITCHES.
17. LOADING, HAULING, PLACING, AND COMPACTING PIT RUN SCREENED FROM THE NORTH BORROW AREA OR FROM THE SOIL STOCKPILE (NEAR ENTRANCE) AREA FOR LANDFILL ACCESS ROADS.
18. SUPPLY AND INSTALLATION OF FLEXAMAT CHANNEL LINING FOR LANDFILL LETDOWN DITCHES.
19. SUPPLY AND INSTALLATION OF CULVERTS FOR ACCESS ROAD CROSSINGS.
20. SUPPLY AND INSTALLATION OF INLET AND ENERGY DISSIPATOR MANHOLES.
21. TREE FELLING, CLEARING, AND GRUBBING (KEPT TO MINIMUM) FOR TRENCHING FOR STORMWATER PIPE (CULVERT).
22. SUPPLY AND INSTALLATION OF STORMWATER PIPE (CULVERT) FOR LET DOWN BETWEEN INLET AND ENERGY DISSIPATOR MANHOLES.
23. EXCAVATING AND BACKFILLING LOCAL SOILS OR COMMON FILL FROM ON-SITE NORTH BORROW AREA, NATIVE SOIL WITHIN THE VICINITY, OR FROM THE SOIL STOCKPILE (NEAR ENTRANCE) FOR CONSTRUCTION OF BYPASS DITCH.
24. HYDROSEEDING DISTURBED AREAS AND FINAL CLEAN UP AND RESTORATION.
25. DEMOBILIZATION AND CLOSE OUT.



**ISSUED FOR TENDER**

NO.	-	-	-
NO.	-	-	-
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NO.	-	-	-
NO.	-	-	-

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Author **T. WAGSTAFF** Designer **D. ENGSTROM**

Drafting Check **D. ENGSTROM** Design Check **M. PARKER**

Project Manager **D. ENGSTROM** Project Director **D. LIDDY**

Client

**THE CITY OF TERRACE  
TERRACE LANDFILL**

Project

**PHASE 2 MSW CLOSURE**

Date **FEBRUARY 3, 2023** Scale **AS SHOWN**

Project No. **12573433**

Title **FINAL CONDITIONS** Size **ANSI D**

Sheet No. **CI-0107**



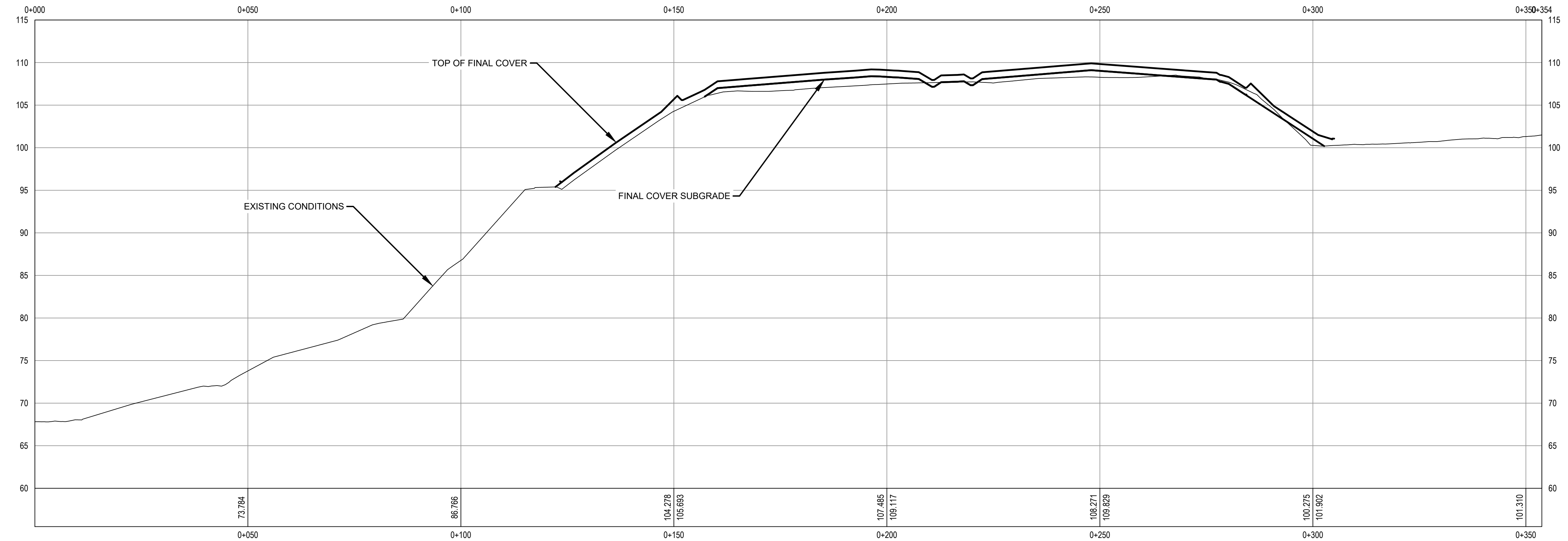
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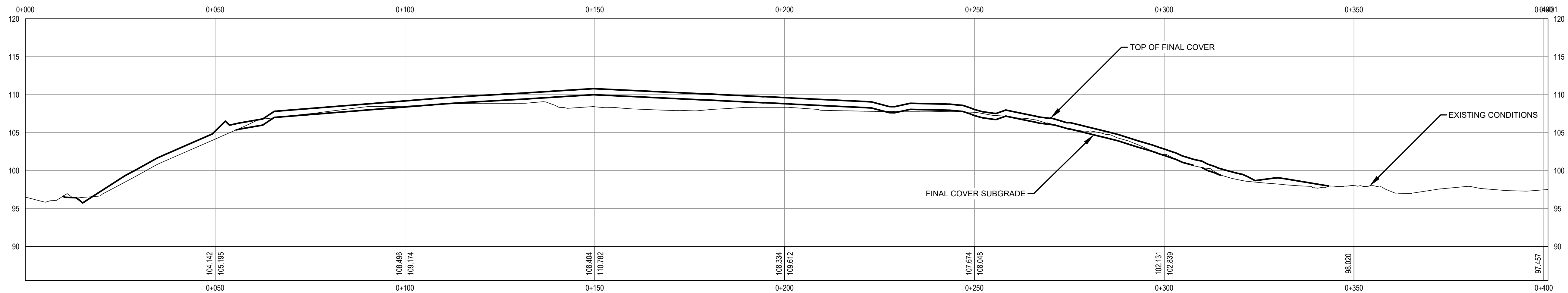
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SECTION A-A'  
SCALE HOR. 1:600  
SCALE VER. 1:300  
CI-0107



SECTION B-B'  
SCALE HOR. 1:600  
SCALE VER. 1:300  
CI-0107

NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-

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Project Manager	D. ENGSTROM	Project Director	D. LIDDY

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TERRACE LANDFILL**

Project

**PHASE 2 MSW CLOSURE**

Date	FEBRUARY 3, 2023	Scale	AS SHOWN
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Project No.	12573433
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Title	<b>CROSS-SECTIONS A-A' &amp; B-B'</b>	Size	ANSI D
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**ISSUED FOR TENDER**

Sheet No.  
**CI-0108**



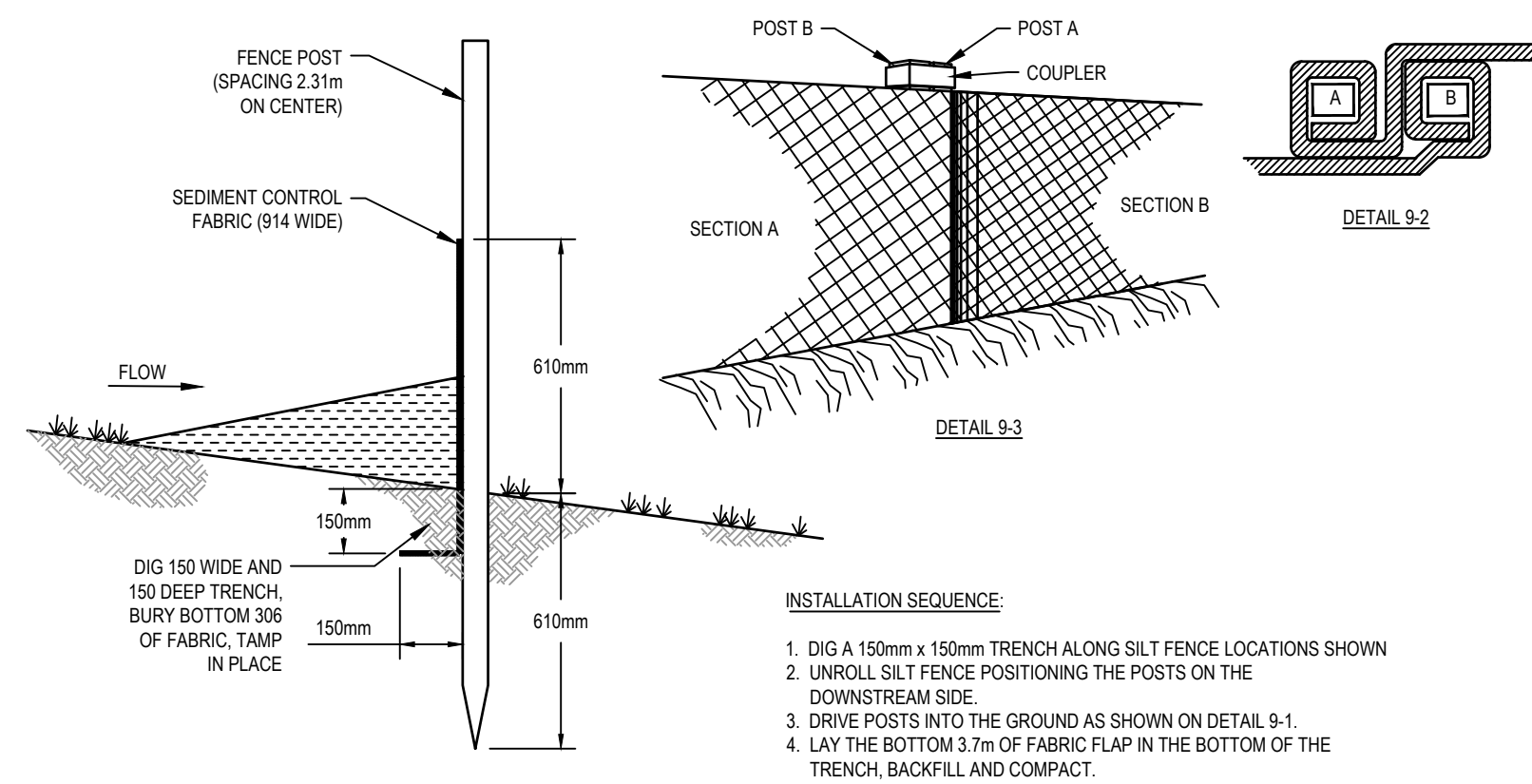
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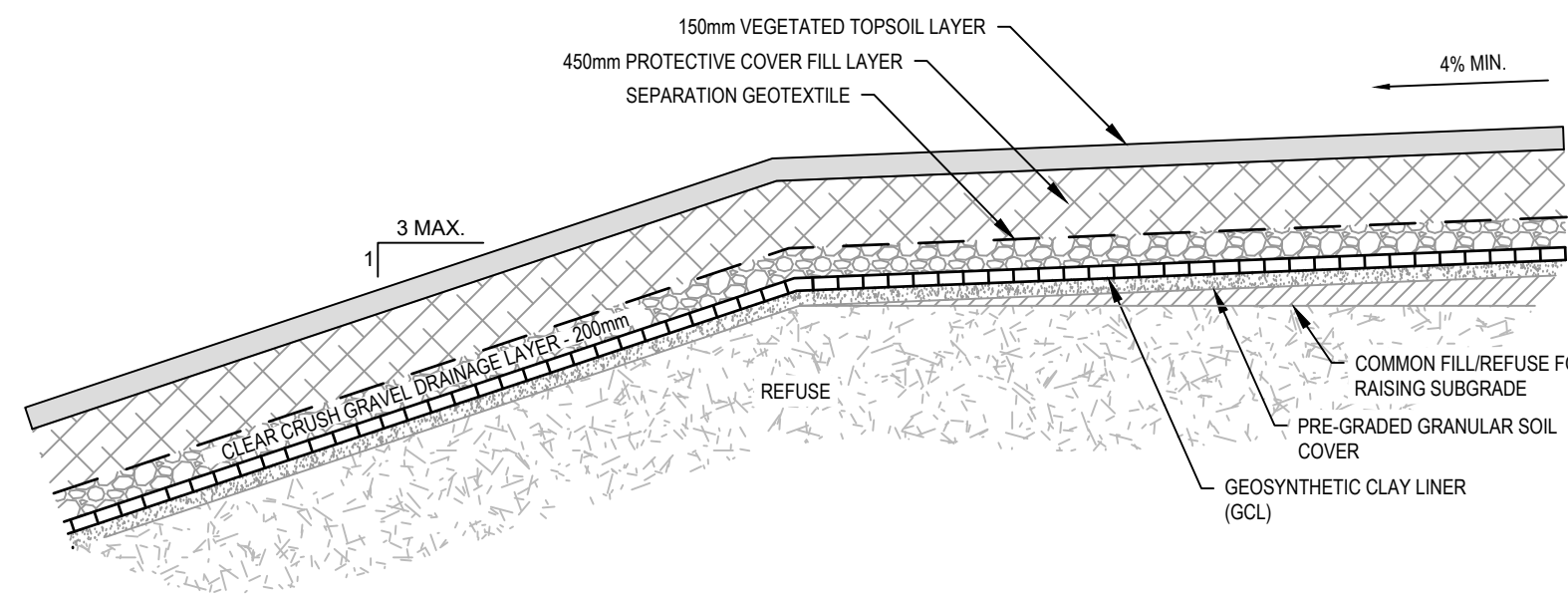
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0 25mm



- INSTALLATION SEQUENCE:**
1. DIG A 150mm x 150mm TRENCH ALONG SILT FENCE LOCATIONS SHOWN
  2. UNROLL SILT FENCE POSITIONING THE POSTS ON THE DOWNSTREAM SIDE
  3. DRIVE POSTS INTO THE GROUND AS SHOWN ON DETAIL 9-1.
  4. LAY THE BOTTOM 3.7m OF FABRIC FLAP IN THE BOTTOM OF THE TRENCH, BACKFILL AND COMPACT
  5. ADJACENT SECTIONS OF THE SILT FENCE ARE JOINED AS SHOWN IN DETAIL 9-2. A COUPLER CAN BE USED TO SECURE ADJACENT POSTS AS SHOWN IN DETAIL 9-3.

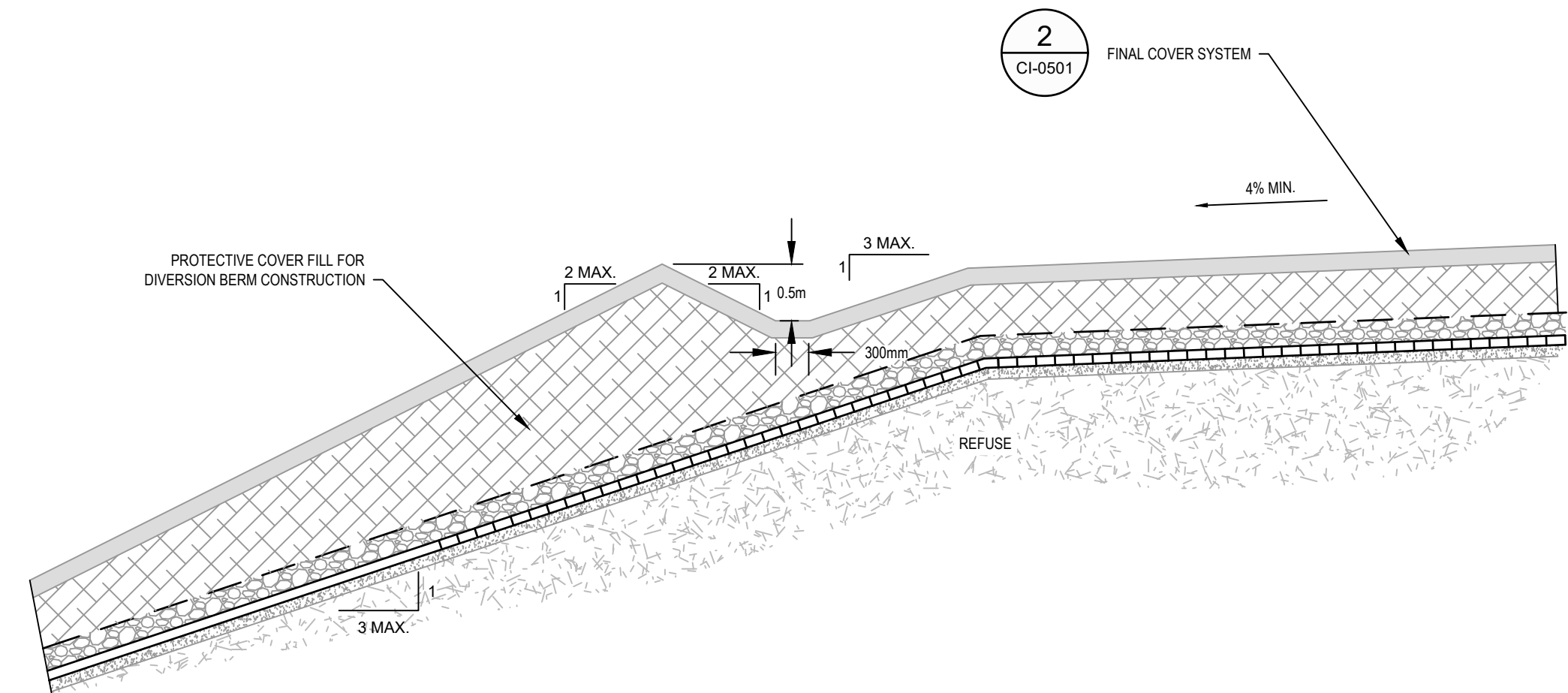
- NOTES:**
1. SILT FENCE HEIGHT TO BE 600mm ABOVE GROUND, CONSTRUCTED OF FABRIC WITH MINIMUM TENSILE STRENGTH OF 54.43 kg (MIRAFI ENVIROFENCE, TERRAFIX TERRAFENCE OR APPROVED EQUIVALENT).
  2. SILT FENCE TO HAVE FACTORY ATTACHED FENCE POSTS.
  3. REFER TO DRAWING FOR LOCATION OF SILT FENCE.

DETAIL 1 EROSION CONTROL FENCE  
1:25 CI-0102

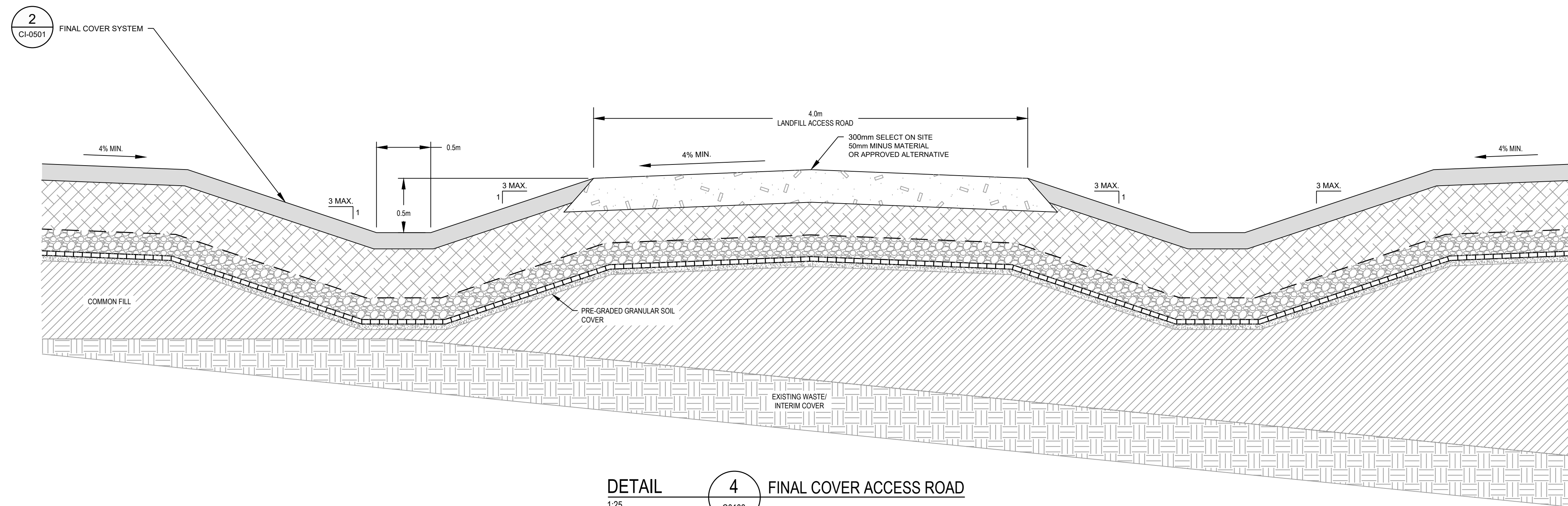


DETAIL 2 FINAL COVER SYSTEM  
1:50 CI-0103

- NOTES:**
1. COMMON FILL TO BE SOURCED FROM ON-SITE BORROW AREA, CLEARED VEGETATION, AND ON-SITE STOCKPILE NEAR ENTRANCE
  2. CLEAR CRUSH DRAINAGE LAYER TO BE SCREENED FROM ON-SITE NORTH BORROW AREA.
  3. COVER FILL TO BE SOURCED FROM ON-SITE BORROW AREA OR STOCKPILE NEAR ENTRANCE



DETAIL 3 MID-SLOPE DITCH  
1:50 CI-0103



DETAIL 4 FINAL COVER ACCESS ROAD  
1:25 C0103

NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-

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Drafting Check	D. ENGSTROM	Design Check	M. PARKER
Project Manager	D. ENGSTROM	Project Director	D. LIDDY

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**PHASE 2 DETAILED  
CLOSURE PLAN**

Date	FEBRUARY 3, 2023	Scale	AS SHOWN
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Project No.  
**12573433**

Title  
**DETAILS I**

Size  
ANSI D

ISSUED FOR TENDER

Sheet No.  
CI-0501



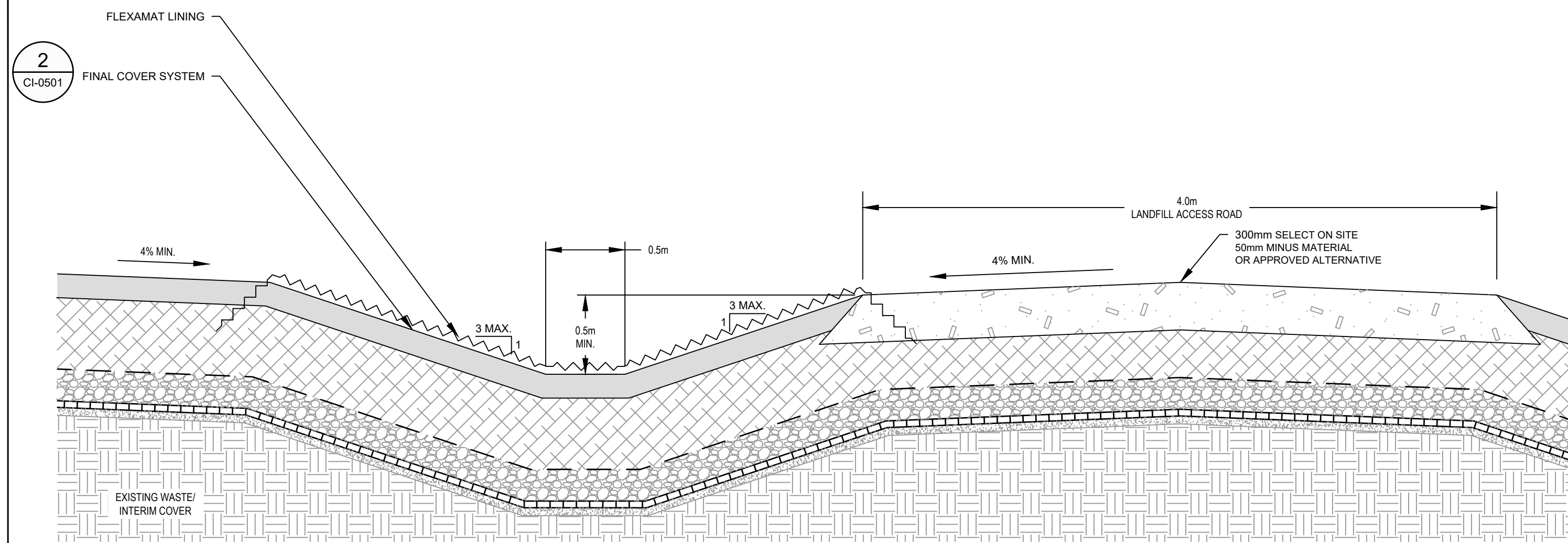
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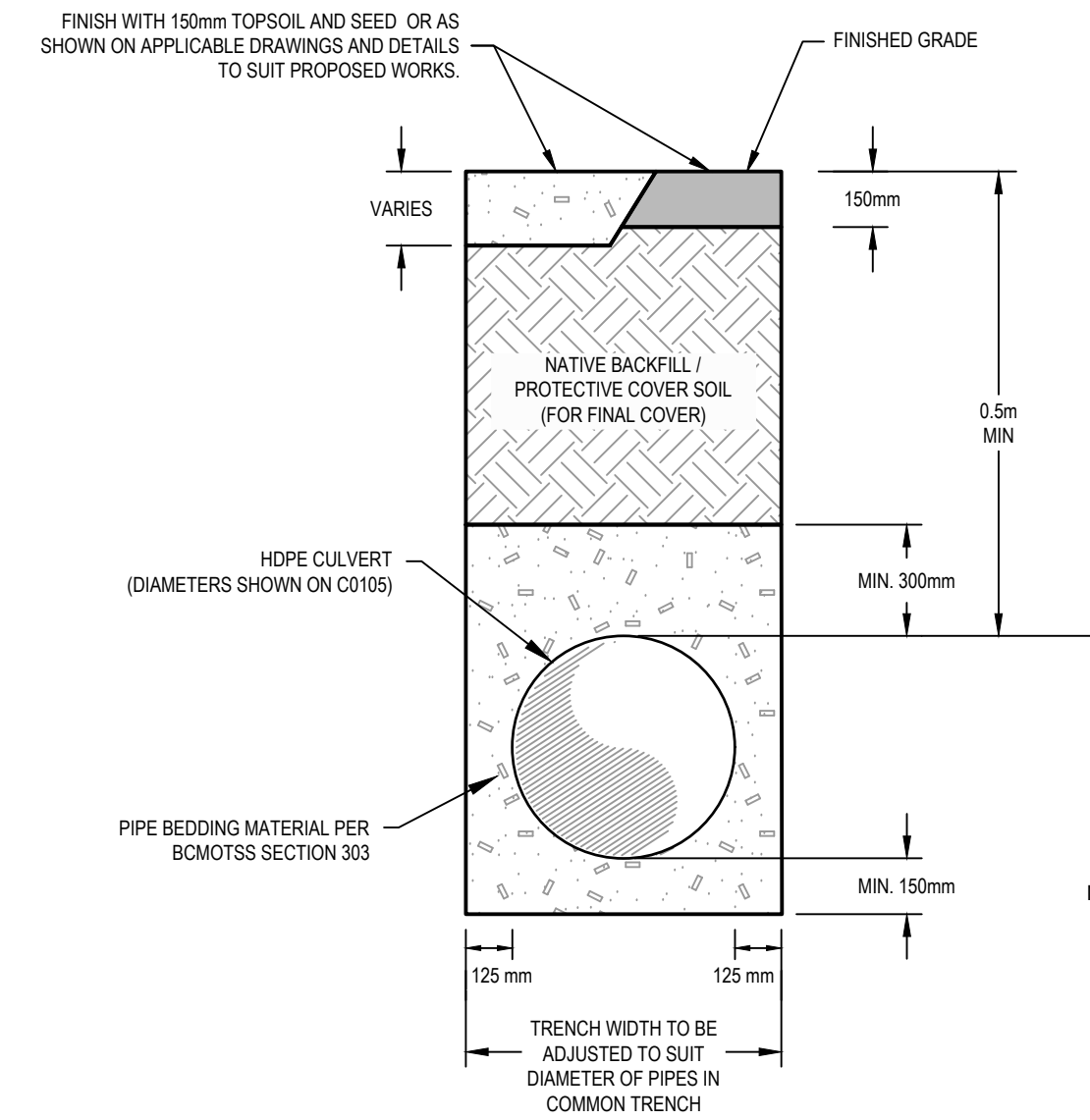


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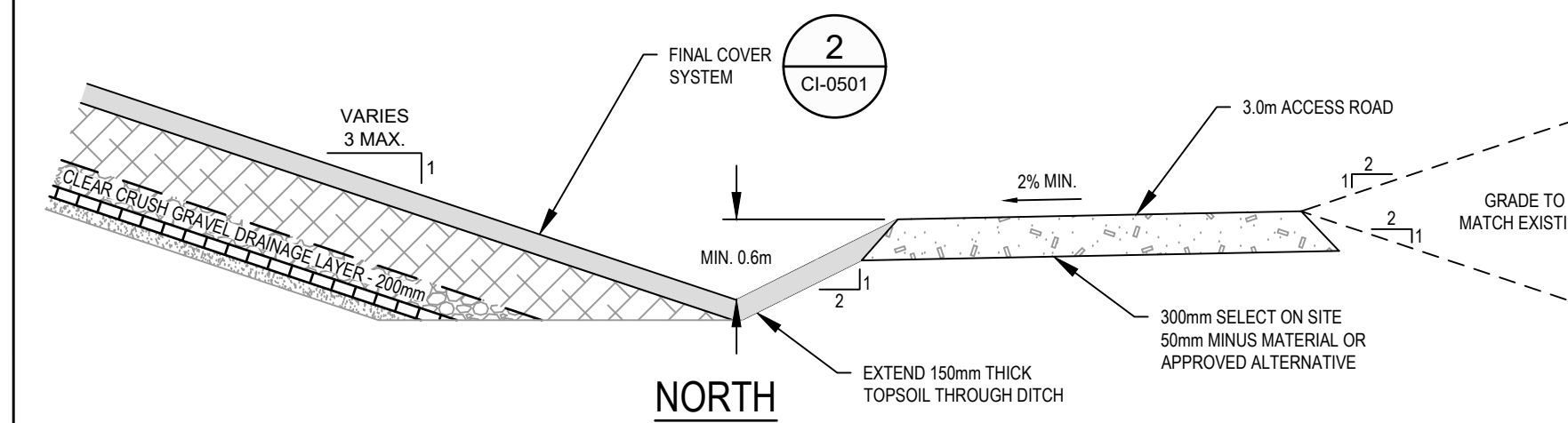
DETAIL 5 SOUTH FLEXAMAT LET DOWN DITCH  
1:25

- NOTE:
1. ACCESS ROAD INSTALLATION NOT REQUIRED FOR NORTH LET DOWN DITCH. BALANCE CUT/FILL WITH SUBGRADE EXCAVATION AND BERM CONSTRUCTION AS SHOWN ON CI-0104.
  2. ANCHOR FLEXAMAT LINING ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
  3. 50mm MINUS MATERIAL TO BE SCREENED FROM ON-SITE NORTH BORROW AREA.

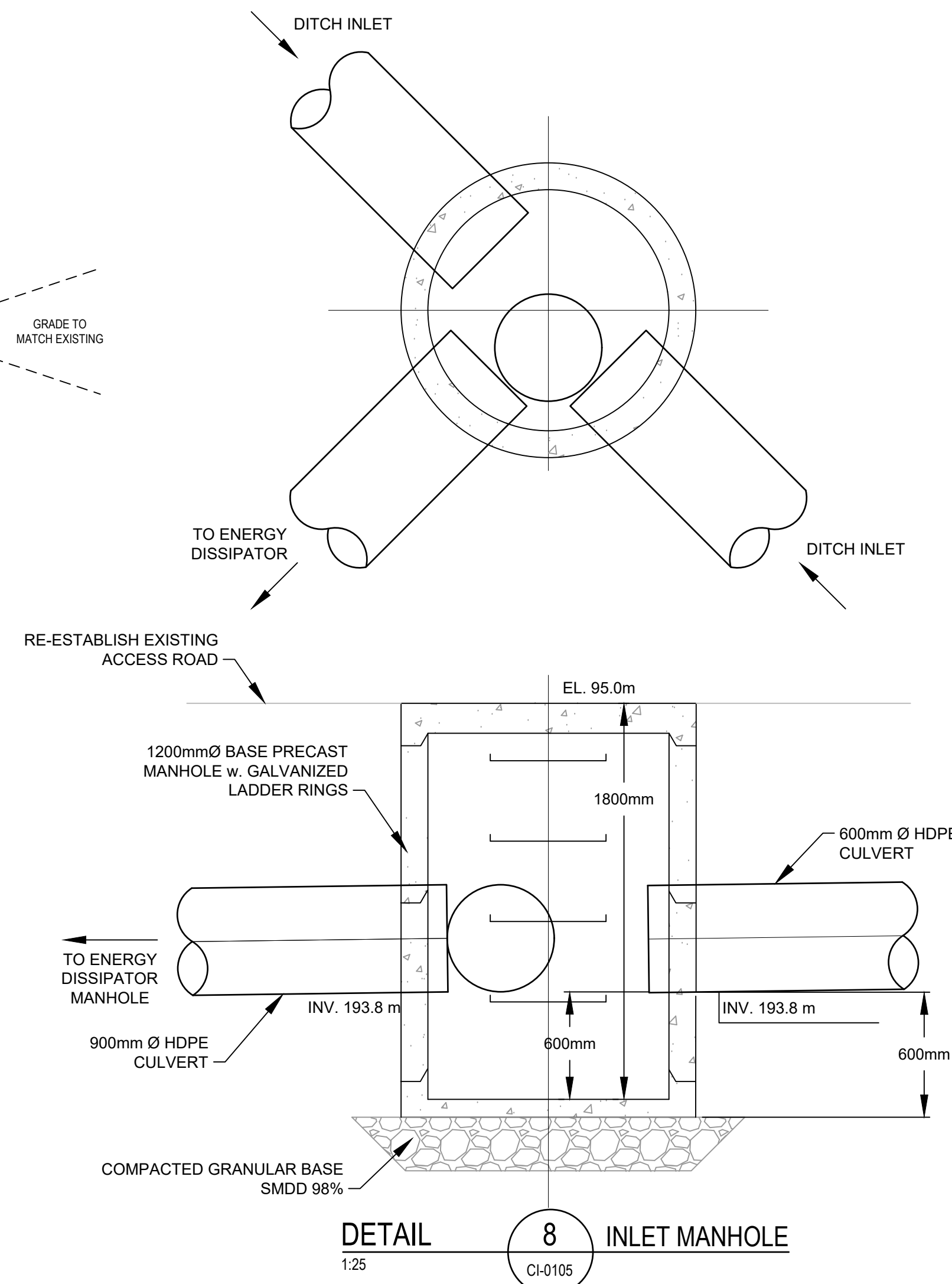
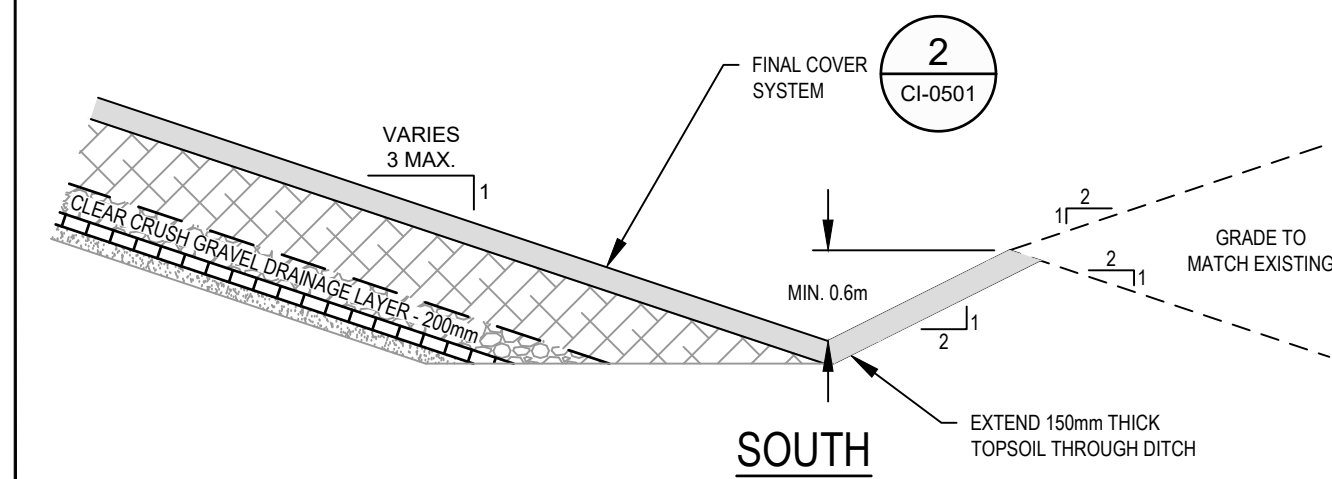


DETAIL 6 CORRUGATED HDPE CULVERT / BELOW GRADE STORMWATER PIPE  
N.T.S.

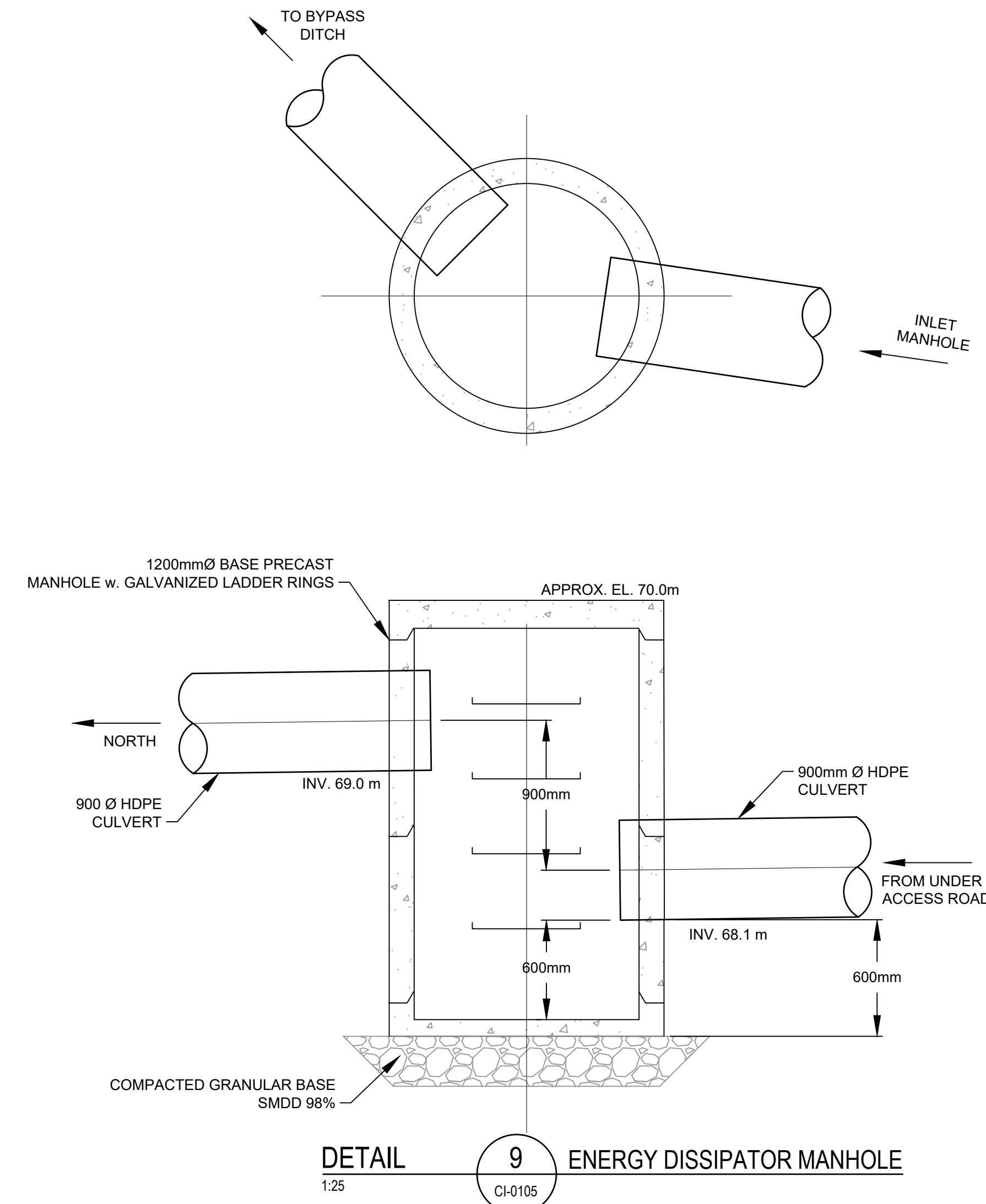
- NOTE:
1. INSTALL STORMWATER PIPE WITH MANUFACTURER'S RECOMMENDED ANCHORS INSTALLED WITH SPACING RECOMMENDED BY MANUFACTURER.
  2. PIPE BEDDING MATERIAL TO BE SCREENED FROM ON-SITE NORTH BORROW AREA.



DETAIL 7 PERIMETER DITCH  
1:50



DETAIL 8 INLET MANHOLE  
1:25



DETAIL 9 ENERGY DISSIPATOR MANHOLE  
1:25

NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-
NO.	-	-	-

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Project Manager	D. ENGSTROM	Project Director	D. LIDDY
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PHASE 2 DETAILED  
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Project No.

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Title

DETAILS II

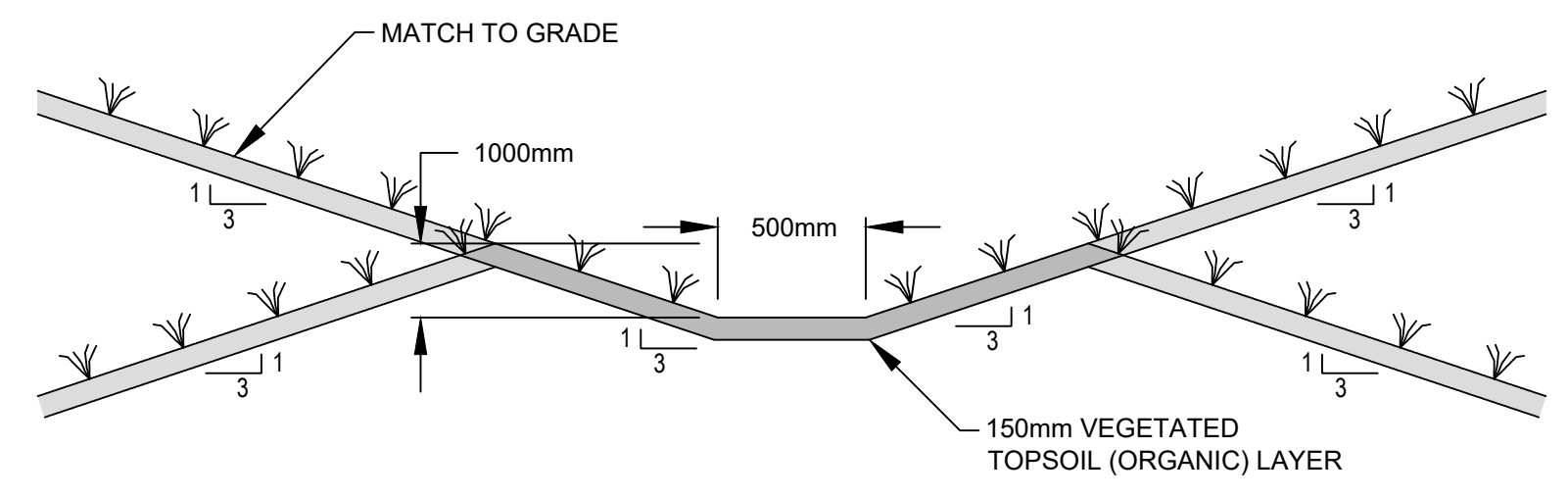
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Sheet No.

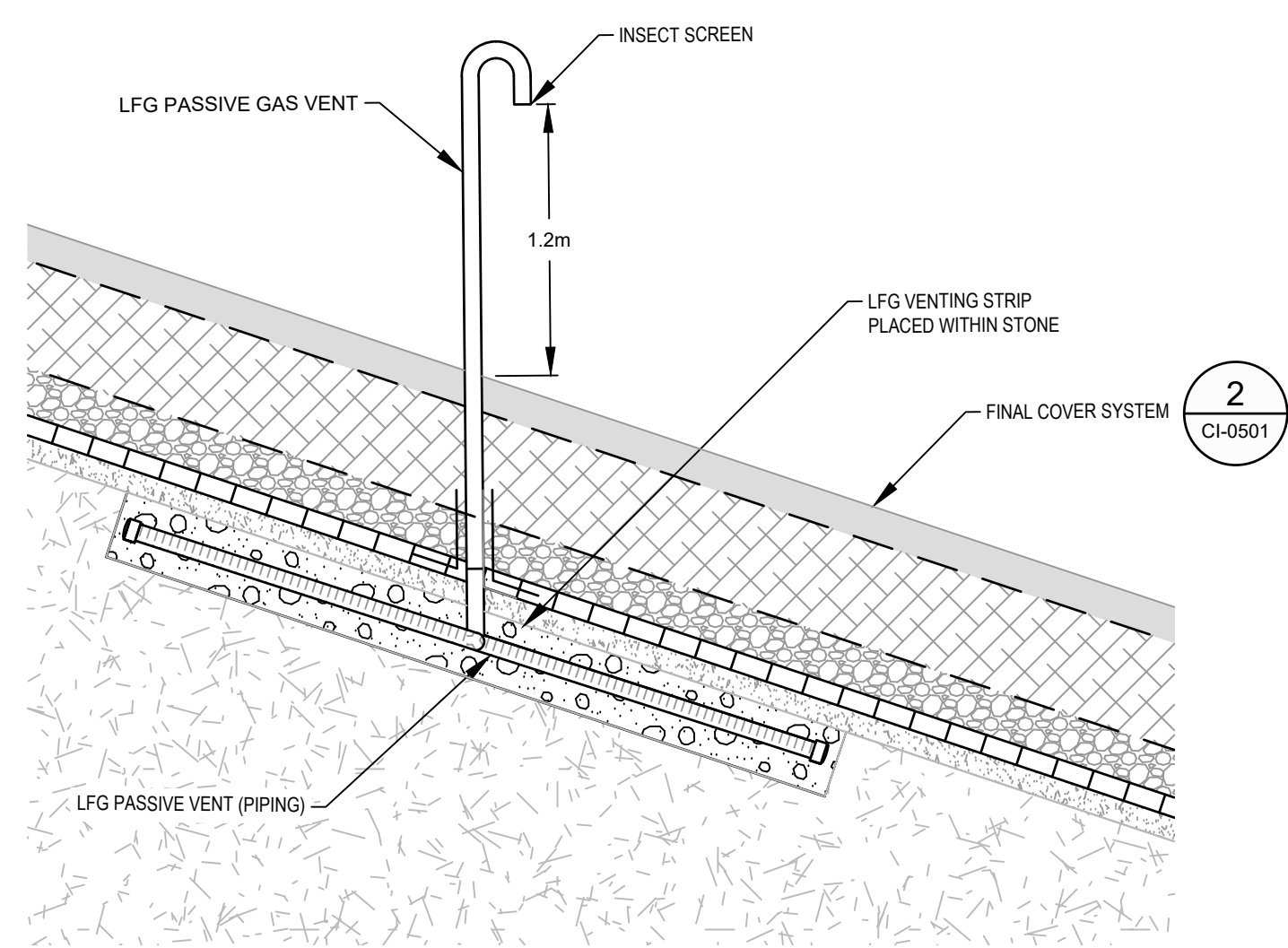
CI-0502

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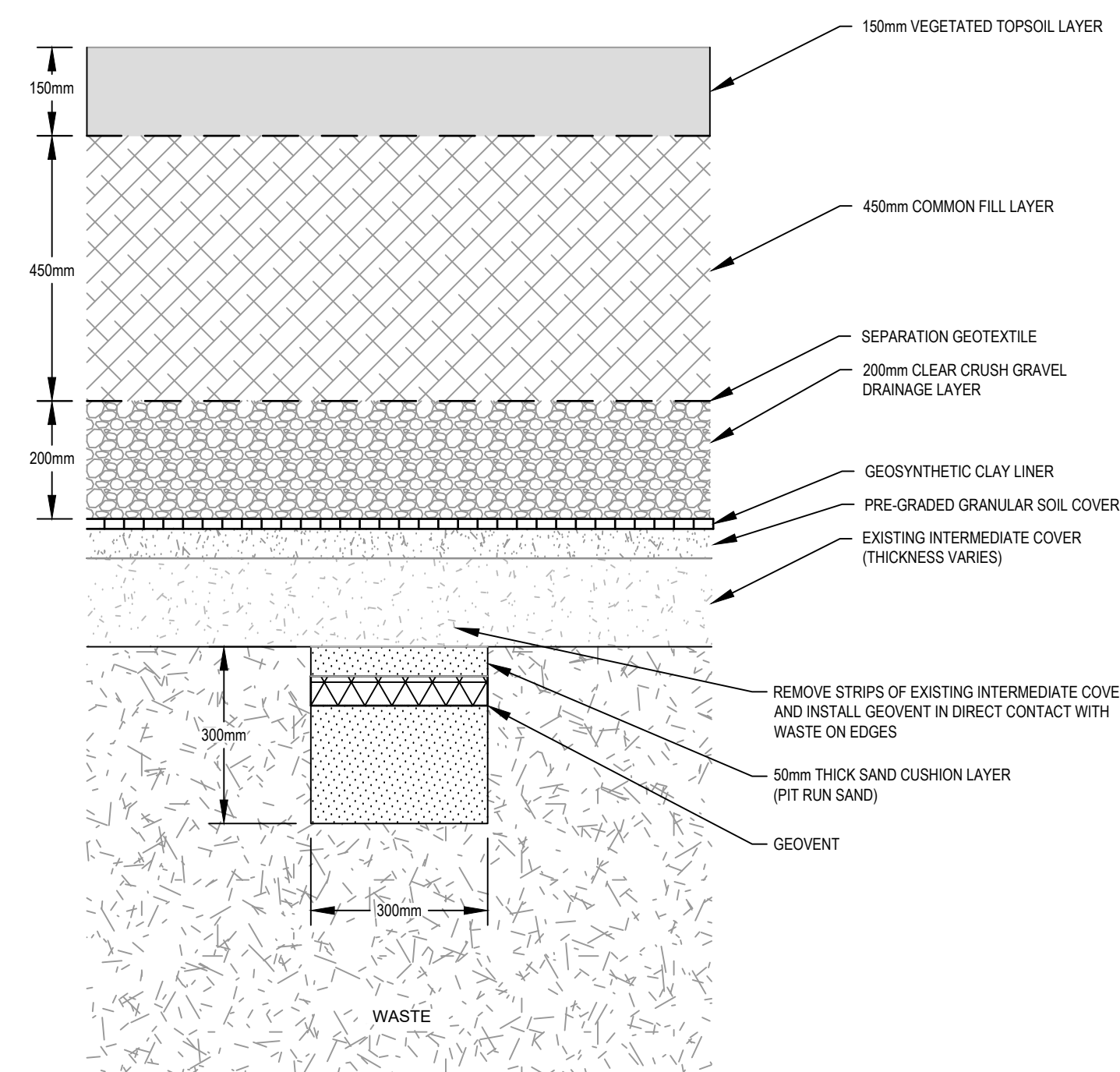


NOTE:  
1. CUT/FILL WITH LOCAL SOILS TO MAINTAIN DITCH DIMENSIONS

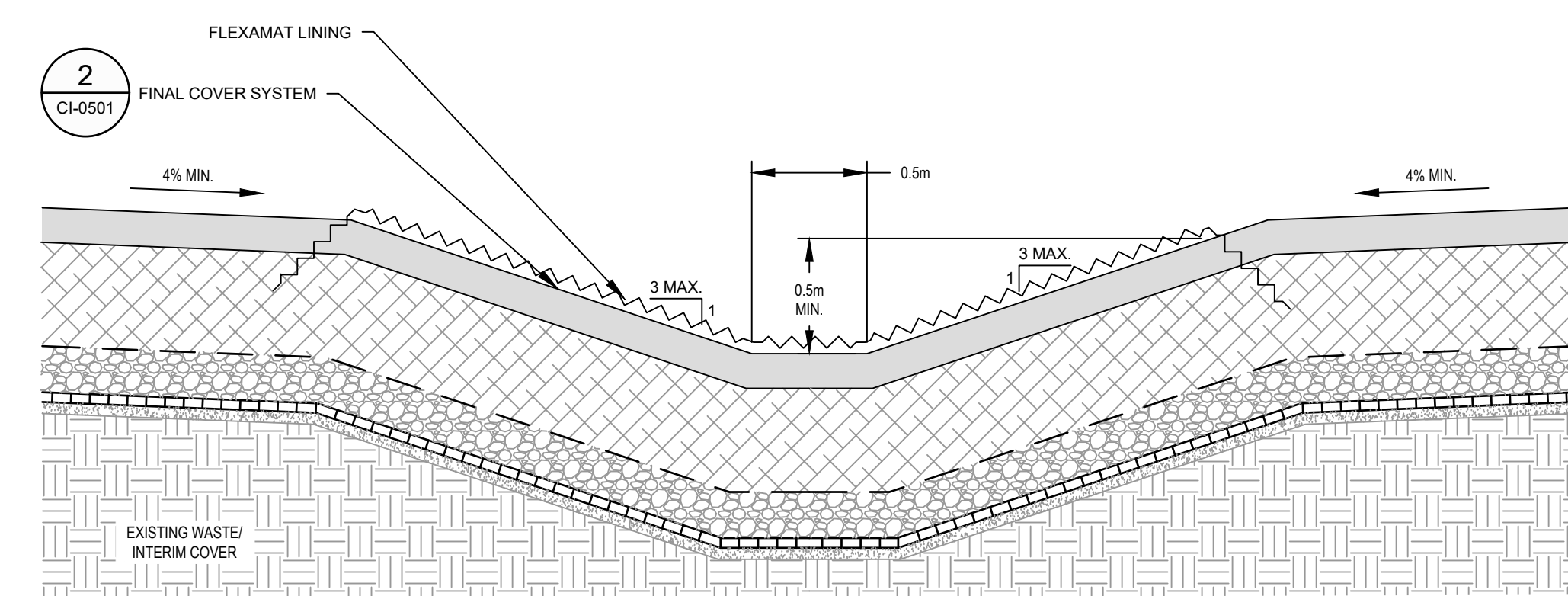
**DETAIL 10 BYPASS DITCH**  
N.T.S. CI-0103



**DETAIL 13 LFG VENT RISER PIPE (PROFILE)**  
SCALE 1:30 CI-0106

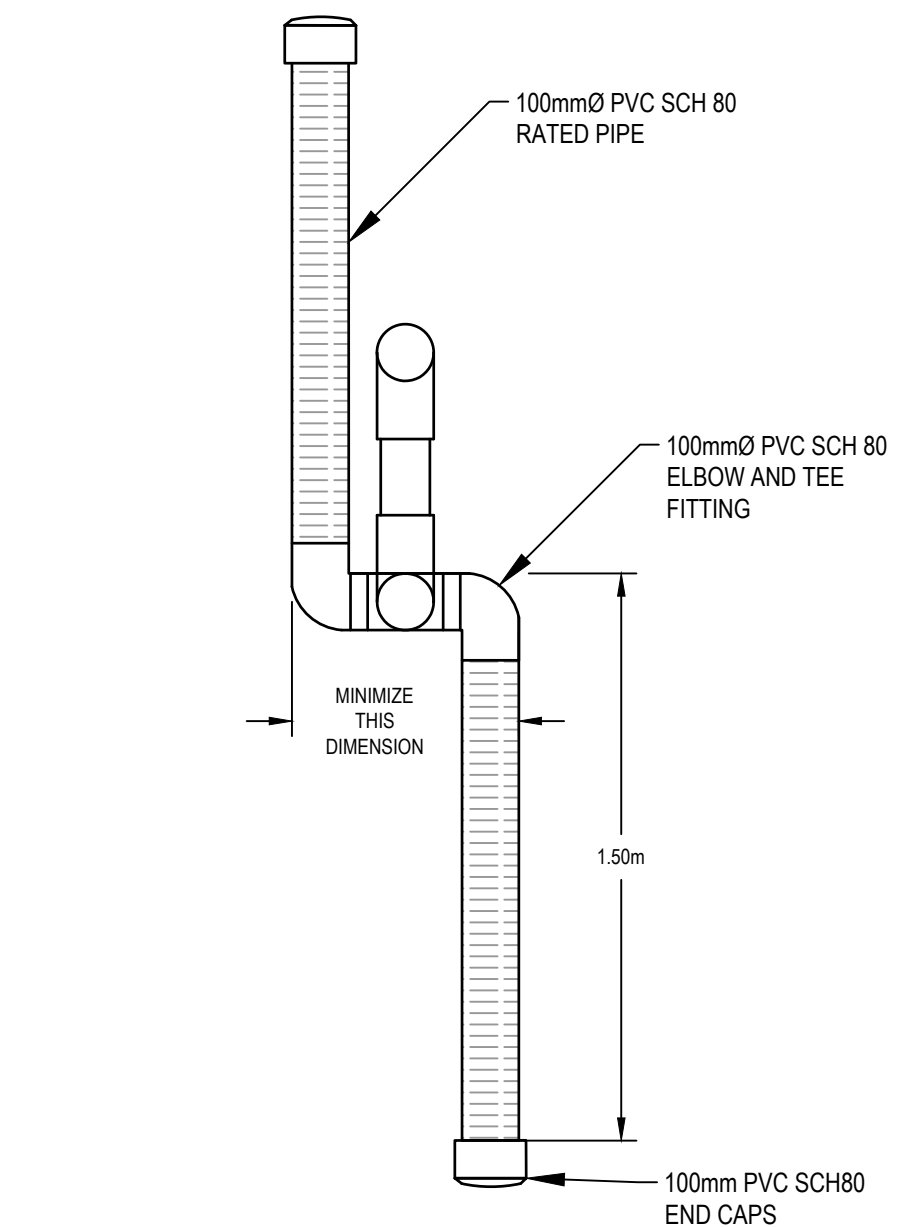


**DETAIL 11 LANDFILL GAS VENT STRIP (TYP.)**  
N.T.S. CI-0106

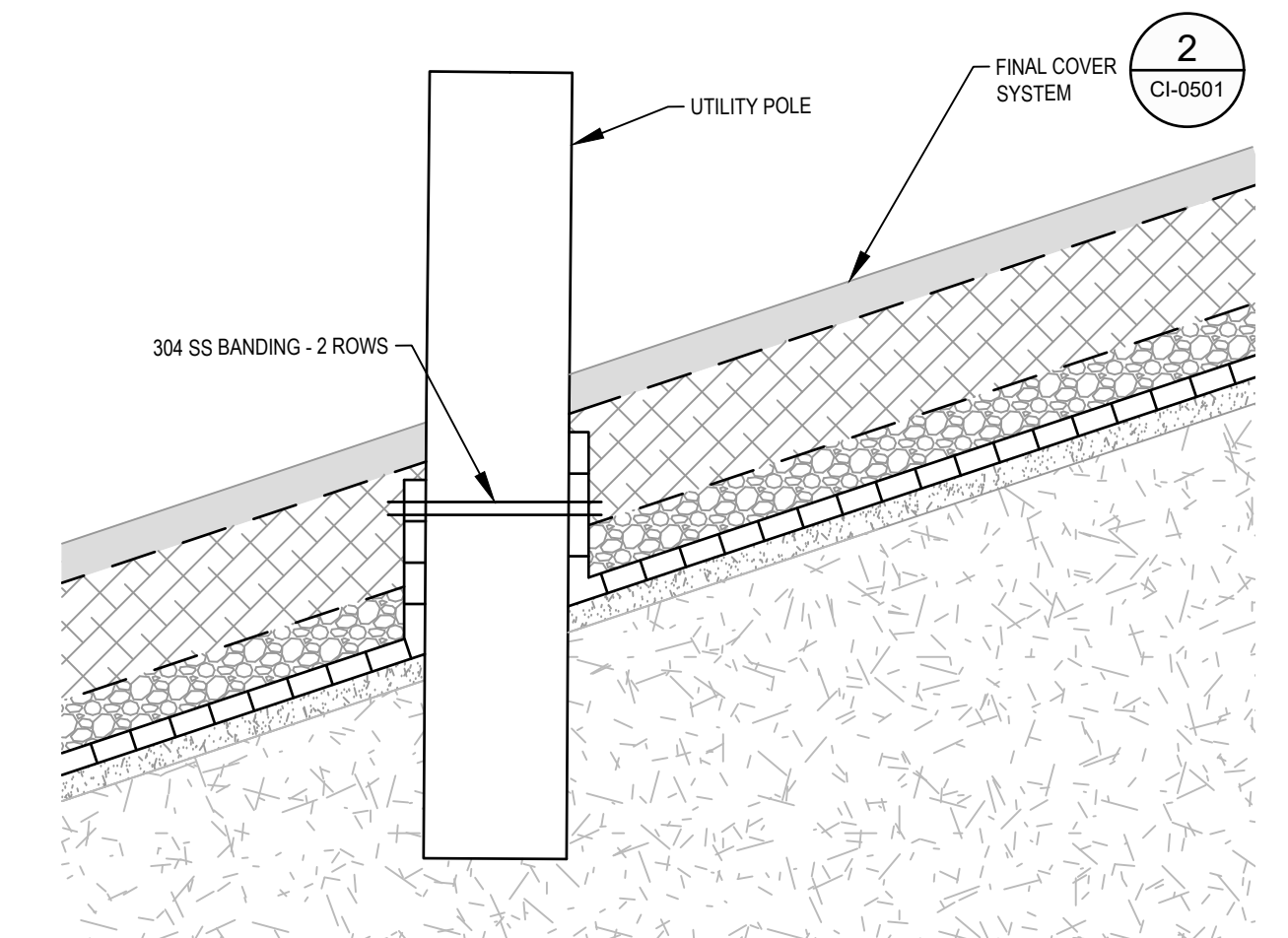


**DETAIL 14 NORTH FLEXAMAT LET DOWN DITCH**  
1:25 CI-0105

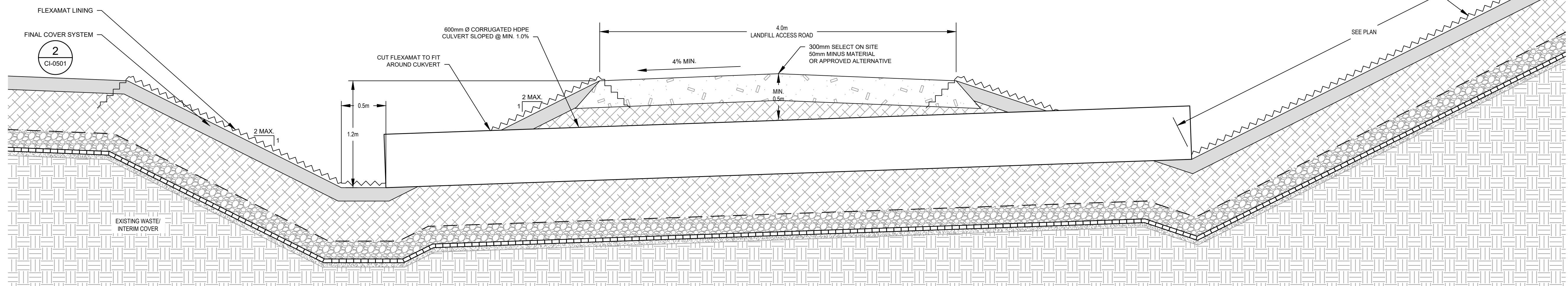
NOTE:  
1. ACCESS ROAD INSTALLATION NOT REQUIRED FOR NORTH LET DOWN DITCH. BALANCE CUT/FILL WITH SUBGRADE EXCAVATION AND BERM CONSTRUCTION AS SHOWN ON CI-0104.  
2. ANCHOR FLEXAMAT LINING ACCORDING TO MANUFACTURER'S RECOMMENDATIONS



**DETAIL 12 LFG VENT RISER PIPE (PLAN)**  
SCALE 1:20 CI-0106



**DETAIL 15 UTILITY POLE PENETRATION**  
SCALE 1:30 CI-0106



**DETAIL 16 CULVERT CONNECTION TO FLEXAMAT LET DOWN**  
SCALE 1:25 CI-0105



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Project No.  
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Title  
**DETAILS III**

Size  
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Sheet No.  
**CI-0503**

