Invitation to Tender

Town of Drayton Valley

Slope and Drainage Rehabilitation – Range Road 73 and Township Road 493

The work to be done consists of:

- Site preparation
- 3500 m^2 Topsoil Stripping
- 800 m^3 Common Excavation
- 990 m^3 Borrow Excavation
- Catchbasin Manhole Installation
- 27 m 900 mm CSP Culvert
- 15.6 m 500 mm CSP Culvert
- Roadway Work
- 855 m^2 Rip Rap
- Erosion and Sediment Control
- Topsoiling and Seeding
- Other Miscellaneous Work

Tender documents may be obtained from COOLNet Alberta or at the Town of Drayton Valley, 5120 - 52 Street, Drayton Valley, Alberta as of Thursday June 7, 2018 at 2:00 p.m. on deposit of cash or cheque payable to Senon Engineering Inc., in the amount of Fifty ($50.00).

Tender must be accompanied by cheque payable to the Town of Drayton Valley for ten (10%) percent of the tender price, or Bid Bond in the same amount. Also, to ensure consideration of the Tender, each Tender must be accompanied by a Consent of Surety as required by the Contract Documents.

Bidders may submit Tenders only up to 2:00 p.m. local time on Thursday June 21, 2018.

The lowest or any other tender will not necessarily be accepted.

Enquiries regarding this Tender shall be directed to:

George Fitzner, P.Eng.
Senon Engineering Inc.
165 Nash Street
Red Deer, AB T4P 1N3
Phone: (403) 318-6723
Email: gfitzner@telusplanet.net

CONTRACT DOCUMENTS

Prepared for:

DRAYTON VALLEY

By:

Senon Engineering Inc.

SENON
ENGINEERING INC.

Slope and Drainage Rehabilitation

Range Road 73 and Township Road 493

SITE GRADING, UNDERGROUND WORKS,
LANDSCAPING AND MISCELLANEOUS OTHER WORKS

June 2018

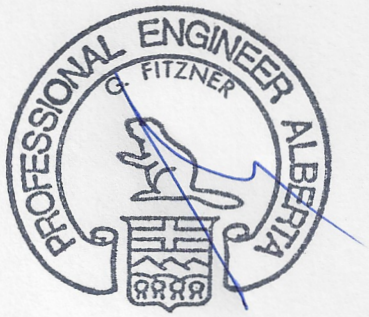
Project No. 336-000

Set # _____

Slope and Drainage Rehabilitation - Range Road 73 and Township Road 493

Town of Drayton Valley

Senon Engineering Inc.



June 4, 2018

SENON ENGINEERING INC.

APEGA PERMIT TO PRACTICE NO. P 12108

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SECTION 00100 – INVITATION TO TENDER

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Enquiries regarding this Tender shall be directed to:

George Fitzner, P.Eng.
Senon Engineering Inc.
165 Nash Street
Red Deer, AB T4P 1N3
Phone: (403) 318-6723
Email: gfitzner@telusplanet.net

The following is a list of Drawings, which are bound separately from the Contract Documents and form part of the Contract.

DRAWING NO.	REV	DRAWING LIST
COV	1	COVER SHEET
IP	1	INDEX PLAN
EC	1	EXISTING CONDITIONS
SP	1	SITE PLAN
PP1	1	ROADWAY AND DITCHES PLAN AND PROFILE STA 5+010 TO STA 5+097 (ROAD) STA 10+000 TO STA 10+026 (DITCH/BERM)
PP2	1	CHANNEL PLAN AND PROFILE STA 0+000 TO 0+110
XS1	1	ROADWAY AND DITCHES CROSS SECTIONS STA 5+010 TO STA 5+097
XS2	1	CHANNEL SECTIONS STA 0+000 TO STA 0+085
DET 2	1	DETAILS

END OF SECTION

SECTION 00200 – INSTRUCTIONS TO TENDERERS

1. Submission of Tenders

1. The directions contained hereunder apply to the project for which tenders were called in the Notice to Tenderers and provide instructions as to the manner in which tenders are to be completed. These Instructions to Tenderers will be included as part of the Contract Documents making up the agreement which will be executed by the Owner and the successful Tenderer and will bind the successful Tenderer and the Owner to the extent and applicability of its provisions. In order to ensure consideration of the tender it should be placed in a sealed envelope marked as **"Tender for Slope and Drainage Rehabilitation"** complete with the Tenderer's name and address.

2. Printed Form of Tenders

1. Only tenders completed on the Tender Form supplied by or on behalf of the Owner with the Contract Documents will be considered. Faxed tenders or faxed Amendments to Tenders will not be accepted. The Tender Price must be written in words as well as figures, and must be for a sum in Canadian Dollars including all tariffs, freight, duties and taxes other than the Goods and Services Tax which must be shown as a separate amount unless otherwise specifically stipulated. Notwithstanding the foregoing, the Owner shall be entitled to accept a Tender in such form as the Owner in its sole discretion deems acceptable.

2. The Owner shall not be obligated to accept Tenders that are unsigned, incomplete, conditional, illegible, unbalanced, obscure, or contain irregularities of any kind. On Unit Price Tenders, if there is a discrepancy found between the unit price and the extended amount, the unit price shall be considered as representing the intention of the Tenderer.

3. In projects involving payment on a unit price basis the Tenderer shall insert a unit bid price for each item and shall fill in the aggregate amount bid determined on the quantities of each item estimated in the schedules with allowances to provide for possible changes to the quantities estimated as indicated in Section 00200.10 hereof and in the summary of the Tender Form.

3. Omissions and Discrepancies

1. The Tenderer shall carefully examine the Tender Documents. If the Tenderer finds discrepancies, errors, omissions or clauses requiring clarification within the Tender Documents the Consultant shall be notified immediately and not less than two (2) business days prior to the Tender closing date, who may send a written instruction to all Tenderers. Where necessary, the Consultant shall respond to reported errors, omissions, discrepancies or clauses requiring clarification by way of Addenda.

2. Should a Tenderer fail to report any such errors, omissions, discrepancies or clauses requiring clarification at least two (2) business days prior to the Tender closing date, the Consultant shall be the sole judge of the Tender Documents.

3. As it is the purpose of the Owner to obtain a tender most suitable to the interests of the Owner and what it wishes to accomplish, the officer or officers awarding the tender shall be the sole judge of what discrepancies, errors, or omissions of a tender or of material accompanying it may be waived.

4. No implied obligation of any kind by or on behalf of the Owner shall arise from anything in the Tender Documents and made by the Owner, are and shall be the only covenants and agreements that apply.

5. Without limiting the generality of Section 00200.3.3, the Tender Documents supersede all communications, negotiations, agreements, representations and warranties either written or oral relating to the subject matter of the Tender made prior to the Tender closing date, and no changes shall be made to the Tender Documents except by written Addenda.

4. Addenda

1. Addenda issued prior to the Tender closing date shall form part of the Tender Documents and the cost for doing the wok therein shall be included in the Tender Sum.

5. Rejection of Tenders

1. The Owner reserves the right to reject any or all tenders. Without limiting the generality of the foregoing, any tender which either:

   - is incomplete, obscure or irregular; or
   - has erasures or corrections in the Tender Form or any Schedule thereto; or
   - omits a bid on any one or more items in any Schedule to the Tender Form; or
   - fails to complete the information required to be completed by a Tenderer in any Schedule or tabulation contained in or attached to the Tender Form or fails to put the complete information required in such Schedule whether the same purports to be complete or not; or
   - is submitted by a Tenderer who, in the opinion of the Owner, is unsuitable to satisfactorily complete the project; or
   - is accompanied by an insufficient or irregularly certified cheque or by a bid bond in an unsatisfactory form or insufficiently executed or of an insufficient amount may be rejected. The Owner has the right to waive any irregularity or insufficiency in any tender.

6. Tender

1. Bidders submitting Tenders shall be actively engaged in the line of work required by the Tender Documents and shall be able to refer to work of a similar nature performed by

them. They shall be fully conversant with the general technical phraseology in the English language of the lines of work covered by the Tender Documents.

2. Each Tenderer shall review the Tender Documents provided by the Owner and confirm that it is in possession of a full set of Tender Documents when preparing its tender.

3. Tenders shall be properly executed in full compliance with the following requirements:

   - The signatures of persons executing the Tender must be in their respective handwriting;
   - If the Tender is made by a limited company, the full name of the company shall be accurately printed immediately above the signatures of its duly authorized officers and the corporate seal shall be affixed;
   - If the Tender is made by a partnership, the firm name or business name shall be accurately printed above the signature of the firm and the Tender shall be signed by a partner or partners who have authority to sign for the partnership;
   - If the Tender is made by an individual carrying on business under a name other than its own, its business name together with its name shall be printed immediately above its signature; or
   - If the Tender is made by a sole proprietor who carries on business in its own name, he shall print its name immediately below his signature.

4. Tenders received from agents representing principals must be accompanied by a Power of Attorney signed by the said principals showing that the agents are duly authorized to sign and submit the Tender and have full power to execute the Contract on behalf of their principal, which Contract, if so executed, will bind the principals and have the same effect as if it were duly signed by the principals.

5. No act of the Owner other than a signed notice in writing shall constitute an acceptance of a tender.

7. Tenders to be Under Seal

1. All tenders shall be under seal; in the case of a body corporate, the tender shall be under the corporate seal of the Tenderer and in the case of an individual person, the tender shall be under the seal of that person and in the case of an association of persons or a firm, each member of the association or firm shall affix his seal to the tender.

8. Tenders Irrevocable

1. Tenders shall not be withdrawn, modified or clarified after being deposited with the Consultant unless such withdrawal, modification or clarification is made in writing. Any withdrawal, modification or clarification of the Tender must be followed by a letter of confirmation signed and sealed in the same manner as the Tender and delivered to the address in the Invitation to Tender within five (5) business days of the notice of withdrawal, modification or clarification.

2. The Tender Form provided in the Contract Documents is to be executed as a specialty instrument and the tender shall be irrevocable and open for acceptance for a period of sixty (60) days from the date and time of closing of tenders. Until the time the tenders are officially opened any Tenderer may withdraw his/her tender without penalty or forfeiture. Such withdrawal must be made before the first of the tenders submitted is opened. If a Tender is withdrawn subsequent to opening of the first Tender and prior to expiration of the sixty day consideration period, the certified cheque or bid bond accompanying this tender may be retained by the Owner as liquidated damages.

9. Tender Quantities

Tender quantities are Engineer's estimates made for the purpose of evaluating tenders and estimating the total cost of the project. It is the Contractor's responsibility to verify all estimated quantities and set his prices according to his estimates.

Each bid price in the Tender Form shall be a reasonable price for each item and the Owner may reject any tender which reflects a manifestly unbalanced bid.

10. Alternative Submissions

1. Tenders must be submitted as per the Tender Form in order to be evaluated or qualify for award of Contract. Alternatives outside the tender, offered by the Contractor, must be submitted with the tender under a separate covering letter in order for the Owner to consider them in his evaluation of tenders.

2. Where trade names are not used in the Tender Documents, approval is required for proposed products that are at variance with the Specifications or Drawings.

3. Where trade names are used in the Tender Documents, approval is required for “alternatives” to those trade name items specified.

4. Applications for approvals under Section 00200.10.1 shall be made in writing five (5) calendar days prior to the closing of Tenders and contain sufficient data to establish that the products are in all respects equal to or better than the products specified in the Contract. These approvals shall be communicated to all Tenderers by addendum.

11. Calculation of Tender Amount for Unit Price Contracts

1. If this Contract is a unit price Contract, the Tenderer shall first add up the total amounts from all of the Schedules as determined on the quantities estimated in the schedules for each item on which a bid is required and shall insert the result in the place indicated on the Tender Form. This sum shall be the "Total Tender Amount". However, the Contractor to whom the Contract is awarded shall be paid at the unit price rate for the actual quantities of work done. If there is a discrepancy between the unit bid price and the total price for any bid item, the error shall be deemed to have occurred in the extension of the

unit price. Therefore, the correct total price shall be the unit price bid times the estimated tender quantity.

12. Return of Contract Deposit Cheques

1. Unless forfeited because of improper withdrawal of a tender after the official time for opening of tenders and before the Owner has awarded a contract in respect of the project for which the tenders were called, or the Owner has decided to abandon either temporarily or permanently the project without awarding a contract, the contract deposit cheques furnished with the tenders shall be returned to all but the three (3) lowest formal Tenderers within thirty (30) days following the opening of tenders. The contract deposit cheques for the three (3) lowest formal tenders which have not been rejected because of irregularities will be returned within two (2) days after the execution of the Contract has been completed by both parties or, in any case, sixty (60) days after the opening of the tenders. Tenderers whose contract deposit cheques have not been forfeited by reason of improper withdrawal of their tenders and who have not had notice that either their tenders have not been accepted or that they are being retained as one of the three lowest formal tenders will have their deposit cheques returned to them on demand.

13. Guarantee Bonds

1. The successful Tenderer shall be required to furnish, at its own expense, a Performance Bond.

2. The Performance Bond shall guarantee the faithful performance of the Contract, and in default thereof, shall protect the Owner against any losses or damage arising by reason of failure to the successful Tenderer to faithfully perform the Contract. The Bond is to be issued by a Canadian Surety Company licensed in the Province of Alberta and satisfactory to the Owner, in the amount of fifty percent (50%) of the Contract Sum.

3. The Performance Bond shall remain in force as a Maintenance Bond for the period specified in the General Conditions of the Contract after the date a Construction Completion Certificate has been issued by the Owner.

4. The successful Tenderer shall furnish, at its own expense, a Labour and Material Payment Bond covering prompt payment of all monies due and owing to all persons having a direct contract with the successful Tenderer for labour and materials used or reasonably required for us in performance of the Work; such Bond to be issued by a Canadian Surety Company licensed in the Province of Alberta and satisfactory to the Owner, in the amount of fifty percent (50%) of the Contract sum.

5. The Performance Bond and the Labour and Material Payment Bond shall be in the forms hereinafter set forth or in such other form as may be acceptable to the owner.

14. Bid Bond

1. The Tenderer may substitute a bid bond issued by a surety company licensed as an insurer in the Province of Alberta as per the requirements of the Alberta Insurance Act for the contract deposit required by the Notice to Tenderers. In no case shall the bond allow the surety to call for new tenders upon the default of the Tenderer or failure of the Tenderer to execute the Contract Documents. The Owner's decision as to whether the bid bond supplied is adequate shall be final and the Owner at its discretion may consider the tender or refuse to consider the tender or may recommend the tender subject to those conditions which to the Owner appear necessary or desirable.

15. Permits, Licenses and Registration

1. The Tenderer, who is awarded the Contract, shall obtain and pay for all permits and licenses required either by the Province, Municipality, or any other authority to enable the Tenderer to do all things necessary to perform the Contract according to the provisions of the Contract Documents.
2. The Tenderer shall also notify all subcontractors working on the Project to obtain and pay for all permits and licenses required either by the Province, Municipality, or any other authority to enable the Tenderer to do all things necessary to perform the Contract according to the provisions of the Contract Documents.
3. Prior to commencing the Work, the successful Tenderer shall obtain all authorizations required by the laws of the Province of Alberta in force enabling it to carry on business to complete the Work required under the Contract. Failure to be so registered shall entitle the Owner to terminate the contract without compensation to the successful Tenderer.

16. Insurance and Safety

1. The Tender shall be accompanied by the Certificate of Insurance, certifying that the insurance as required in the General Conditions of the Contract is in place or if the required insurance is not in place, a letter from the Tenderer’s insurance Agent certifying that the required insurance will be issued to the Tenderer if the Tenderer is the successful Tenderer.
2. The successful Tenderer shall be required to secure and maintain at its own expense standard automobile insurance, bodily injury and property damage insurance, comprehensive general liability insurance and worker’s compensation and employer’s liability insurance. The coverage shall be as specified in the General Conditions and the Supplementary Conditions of the Contract.
3. It is the Owner’s intention to designate the successful General Contractor as the “Prime Contractor” in accordance with the Occupational Health and Safety Act (Alberta). Only those Contractors who have a valid “Certificate of Recognition” (COR) or “Small Employer Certificate of Recognition (SECOR) shall accompany the Tender.

17. Site Conditions

1. The Tenderer shall carefully examine the site of the Work before submitting a Tender and shall satisfy itself as to the nature and location of the Work, local conditions, soil structure and topography, the nature and quality of materials to be used, the equipment and facilities needed preliminary to and during the execution of the work, and all matters which may in any way affect the Work.
2. The Tenderer is fully responsible for obtaining all information required for the preparation of its Tender and for the execution of the Work.
3. The Tenderer shall not rely upon any oral information provided to it by the Owner or its representatives.

18. Responsibility Regarding Existing Utilities

1. The successful Tenderer shall be responsible for notifying the appropriate utility companies of his intention to carry out operations in the vicinity of any existing main, line, conduit or other structure or utility, at least one (1) week in advance of any such operations being carried out. The Contractor shall arrange a site meeting with the Engineer and one representative of any utility company requiring relocation or new installation during construction.
2. The Owner shall not be responsible for any delays which may be associated with relocation of existing utilities or installation of new utilities. The Contractor shall be responsible for the repair of any damage his work may cause to existing or new utilities and the cost of any special measures that may be required to protect existing utilities.

19. Material Suppliers

1. The Tenderer shall list, if required, in the Tender Form provided, the names of the material suppliers it intends to use together with the trade or brand name of the material supplied.
2. The material suppliers shall not be changed after the Tender closing date unless prior written permission of the Owner is obtained. Failure to obtain prior written permission shall constitute as substantial breach of the Contract, and the Owner may at its option, immediately terminate the Contract on written notice to the Contractor. The Owner shall not be liable for any damages, costs or losses whatsoever incurred by the successful Tenderer as a result of said termination.
3. Prior to the decision who is the successful Tenderer, the Owner may object to any material supplier proposed by a Tenderer in which case the Tenderer shall nominate another material supplier who is acceptable to the Owner.

20. Equipment

1. The Tenderer shall list, if required, in the Tender Form provided, the equipment it intends to use in the Work. The equipment shown shall be used in the Work unless otherwise permitted by the Owner in writing. The words “As Required” or similar wording will not be sufficient to describe the equipment.

21. Ordering Materials and Equipment

1. Within ten (10) calendar days of receipt of notice that it is the successful Tenderer, the successful Tenderer shall be required to furnish evidence satisfactory to the Owner of the placement and acceptance of orders for materials required to complete the Work. Failure or neglect to do so, shall, at the option of the Owner, entitle the Owner to terminate the Contract and the Owner shall not be liable in any way for damages, costs or losses whatsoever incurred by the Bidder as a result of said termination.

22. Subcontractors

1. The Tenderer shall list in the Tender Form the name of each subcontractor and/or consultant it proposes to use for the portions of Work described in each section of the Specifications.
2. If the Owner or Consultant, after acceptance of a tender by the Owner, but before execution of the Contract objects to any subcontractor proposed to be employed by the successful Tenderer in the performance of the Contract, and the Contractor refuses or neglects to nominate another subcontractor acceptable to the Owner, the Owner may rescind its acceptance of the tender and return the certified cheque of the successful Tenderer. In such event, neither the Owner nor the successful Tenderer shall have any rights or obligations under the Contract or in respect of the acceptance of tender, and the Owner may award the Contract to another Tenderer.
3. The drawings and specific clauses of the Specifications have been arranged into various sections or subdivision to better describe the Work to be carried out under this Contract. The successful Tenderer shall be solely responsible for the Work under the Contract and for the allocation of the Work to subcontractors.
4. The Work of the subcontractors shall be carried out to the satisfaction of the Owner.

23. Enquiries

Enquiries regarding the documents shall be directed to:

George Fitzner, P.Eng.
Phone: (403) 318-6723
Email: gfitzner@telusplanet.net

24. Federal Commodity Tax

1. The Tenderer shall include in the Tender all federal taxes, other than the Goods and Services Tax, including customs, duties, excise duties and all other taxes and charges applicable with respect to the Tender, unless otherwise specifically stipulated.
2. The Good and Services Tax is to be quoted as a separate amount on all taxable supplies; zero-rates and exempt supplies are to be noted separately.
3. The Owner is not obligated to accept a Tender not complying with the tax-related instructions.
4. In the event that any federal commodity tax, imposed on goods or services supplied by the successful Tenderer, increases or decreases from the amount and rates of same currently in effect, or in the event that any new federal commodity tax, or other tax is imposed on such goods or services, or if any existing federal commodity tax is abolished, prices shall be increased or decreased accordingly by the amount or rates of the increase or decrease of such federal commodity tax, or other tax provided that such changes occur on or after the closing date of the Tender and that there was no prior knowledge, notice or announcement of same. Otherwise the Contract sum shall be based on the specific federal commodity tax status shown therein, which must be adhered to and all invoice billings must agree thereto. All invoice billings shall show the Goods and Services Tax as a separate amount.
5. The federal commodity tax conditions shall have precedence in the case of conflict in interpretation with any other provisions of the Contract, and all such figures given to the Tender shall be taken as binding amounts for the purpose of determining the successful Tenderer.
6. It is the responsibility of the successful Tenderer to determine the correct amounts and classifications of all taxes with respect to the foregoing.
7. The successful Tenderer shall co-operate fully with the Owner and the proper authorities in seeking to obtain all refunds on federal taxes that the Owner may be entitled to on tax paid goods.

25. Commencement and Completion of Work

1. The successful Tenderer shall commence the Work within seven (7) calendar days after the Owner give notice to such Tenderer to proceed with the Work and shall complete the Work by the date specified in the Invitation to Tender.

26. Construction Schedule

Upon request the Tenderer shall submit a schedule related to the construction phasing. The schedule shall indicate milestone dates for the completion of the major components of the work. The schedule shall allow completion of the works by October 15, 2018.

END OF SECTION

SECTION 00300 – TENDER FORM

CONSTRUCTION OF: SLOPE AND DRAINAGE REHABILITATION – RANGE ROAD 73 AND TOWNSHIP ROAD 493, TOWN OF DRAYTON VALLEY

at the locations set out in the schedule hereto or such other locations as may be designated by the Owner.

Tender of
(Name of Tenderer)
(hereinafter called "the Tenderer")

offers to furnish and deliver all materials, to provide the necessary equipment and to do and perform all Work for the noted construction in accordance with the Contract

TO: Town of Drayton Valley
5120 - 52 Street
Box 6837
Drayton Valley, Alberta T7A 1A1

The Tenderer has obtained and carefully examined the Invitation to Tender, the Instructions to Tenderers, General and Supplementary General Conditions, the Detailed Specifications and Special Provisions and the Drawings referred to in the said documents applicable to the Work or project designated above and referred to in the Notice to Tenderers.

The Tenderer has also carefully examined the sites of the Work and will provide all necessary equipment and will do all the Work and furnish all materials called for by the Contract Documents in the manner prescribed therein, for the sums listed in the schedules hereto.

The quantities for the Work shown herein are approximate only and the unit prices bid will apply to the actual work completed.

The Tenderer agrees to begin Work within seven days of notice to proceed unless otherwise agreed to by the Engineer and proceed so as to complete the Work by October 15, 2018.

Unit Price Schedule

ITEM NO.	DESCRIPTION OF WORK	UNIT	ESTIMATED QUANTITY	UNIT PRICE	EXTENDED AMOUNT
1	Mobilization/Demobilization (Sec 01025)	ls	1	$	$
2	Traffic Accommodation (Special Provisions)	ls	1	$	$
3	Topsoil Stripping (0.2m) and Stockpile (Sec 02113)	m^2	3500	$	$
4	Common Excavation (Sec 02311)	m^3	800	$	$
5	Borrow Excavation (Sec 02311, Special Provisions)	m^3	990	$	$
6	Grout and Abandon Existing Culvert (Special Provisions)	m^3	6.8	$	$
7	Remove and Reuse Existing Rock Rip Rap (Special Provisions)	m^2	100	$	$
8	Install 1800mm Catchbasin Manhole and Slab (Sec 02563, Special Provisions)	ea	1	$	$
9	Supply and Install Two (2) NF-31 Frame and Grates (Sec 02563, Special Provisions)	ea	2	$	$
10	Supply and Install 900mm CSP Culvert (Sec 02315, 02610, Special Provisions)	m	27.0	$	$
11	Supply and Install 500mm CSP Culvert (Sec 02315, 02610, Special Provisions)	m	15.6	$	$
12	Remove, Stockpile and Reinstall Road Material Around Culvert Installations (Sec 02315, 02610, Special Provisions)	m^3	545	$	$
13	Place 100mm Gravel Surface (Sec 02317)	m^2	700	$	$
14	Remove and Reinstall Guardrail (Special Provisions)	m	20	$	$
15	Supply and Install 300 mm to 600 mm Rip Rap in Channel (Sec 02371, Special Provisions)	m^2	735	$	$
16	Supply and Install 150 mm to 300 mm Rip Rap at Check Dams, 600 mm Pipe and at Manhole (Sec 02371, Special Provisions)	m^2	120	$	$

ITEM NO.	DESCRIPTION OF WORK	UNIT	ESTIMATED QUANTITY	UNIT PRICE	EXTENDED AMOUNT
17	Non-woven Geotextile Filter Fabric (Sec 02342)	m^2	775	$	$
18	S75 Single Net Straw Matting (Special Provisions)	m^2	140	$	$
19	Topsoil Placement (Sec 02911)	m^2	2710	$	$
20	Hydroseeding (Sec 02911)	m^2	2710	$	$
21	Silt Fence (Special Provisions)	m	80	$	$
				Total	**$**

Date: _____

TENDERER: _____

ADDRESS: _____

_____

_____

_____

FOR: **SLOPE AND DRAINAGE REHABILITATION – RANGE ROAD 73 AND TOWNSHIP ROAD 493 - SITE GRADING, UNDERGROUND WORKS, LANDSCAPING AND MISCELLANEOUS OTHER WORKS**

TO: Town of Drayton Valley
c/o Senon Engineering Inc.
165 Nash Street
Red Deer, AB T4P 1N3

1. The Tenderer shall perform the Work as defined in the General Conditions of the Contract (herein referred to as the "Work") and fulfil all other requirements of the Contract for the sum of:

   _____

   Canadian Dollars ($ _____), plus Goods and Services Tax of

   $ _____ for a total of $ _____.

2. The Tenderer submits the following with the Tender.

   2.1. A Certificate(s) of Insurance or Letter of Insurability

3. The Tenderer hereby acknowledges receipts of the following addenda:

Addendum No.	No. of Pages	Dated

4. The Tenderer shall, if his Tender is the successful Tender, execute the Contract in accordance with the Tender Documents. If the Tenderer fails or declines to execute the Contract with the Owner whether or not any other tender has been previously awarded, the Owner reserves the right to recover from the Tenderer damages suffered.

5. The Tenderer understands that if its Tender is the successful Tender, the Owner will so communicate in writing to the Tenderer at its address given in this Tender Form and no further notice will be issued. If the Tenderer is advised that it is the successful Tenderer, the Tenderer shall within fourteen (14) days of receipt of such notice, and prior to commencement of the Work:

   5.1. furnish the Certificates of Insurance called for in the General Conditions; and

   5.2. furnish the Certificates of Clearance from the Workers' Compensation Board.

6. The Tenderer hereby represents to the Owner that it:

   6.1. has carefully examined the Tender Documents as listed in the Invitation to Tender;

   6.2. has carefully examined the Work site; and

   6.3. has the resources, skills and ability to perform the Work in accordance with the Tender Documents.

7. The Tenderer understands and agrees that:

   7.1. The Owner reserves the right to increase, decrease, delete or vary any portion of the work, and the Tenderer agrees to comply with any such change in the Work subject to valuation and adjustment as provided in the Contract.

   7.2. The quantities listed by the Owner in the schedule herein are approximate only and are for the purposes of comparing Tenders. No claim will be allowed for any loss anticipated profits resulting from any excess or deficiency in the quantities shown.

   7.3. Payment under the Contract will be made on the basis of completed Work, or portions thereof, measured and accepted by the Owner and valued at the applicable unit prices, or applicable lump sum prices or portions thereof.

8. The Tenderer declares that with respect to Federal Commodity Tax (Section 00200.25) instructions:

   8.1. the Tender Documents have been duly observed and adhered to;

   8.2. the Good and Services Tax status of the goods involved has been properly determined; and

   8.3. all rates and entitlements provided for in the relevant tax statutes as affecting the Owner have been duly considered.

9. The Tenderer represents and warrants to the Owner that the several declarations and matters stated in this Tender are true and binding in all respects, and that this Tender has been compiled by

the Tenderer with full knowledge and understanding of all matters and things called for insofar as they relate to the Tender Documents.

10. The Tenderer also agrees that this Tender is irrevocable for thirty (30) days after the closing date for receipt of tenders and that the Owner may at any time within such period accept this tender whether any other tender has previously been awarded or not and whether Notice of Award or another tender has been given or not.

11. List of Subcontractors to be employed in the Work.

Subcontractor/Consultant	**Nature of work or material supply**	**Reason for use if not resident of Alberta**

12. List of equipment to be used in the Work.

Unit Description	**Capacity**	**Age**	**Condition**	**Present Location**	**Owner's Name**

This tender is executed under seal at:

this _____ day of _____, 2018

FOR INDIVIDUAL OR PARTNERSHIP:

SIGNED, SEALED AND DELIVERED by:

X

(Tenderer – please print) (Signature of Tenderer)

In the presence of:

X

(Print Name) (Signature)

Title:

FOR LIMITED COMPANY:

The Corporate Seal of:

(Tenderer – please print) (Seal)

Was hereunto affixed by the following duly authorized signing authorities:

In the presence of:

X

(Print Name) (Signature)

Title:

X

(Print Name) (Signature)

Title:

Note: If the tender is by a joint venture, add additional forms of execution for each member of the joint venture in the appropriate form or forms above.

SECTION 00400 – CONTRACT AGREEMENT

THIS AGREEMENT made in triplicate on this _____day of _____A.D.

BETWEEN

_____

(hereinafter called "the Contractor")

OF THE FIRST PART

-and-

THE TOWN OF DRAYTON VALLEY,

(hereinafter called "the Owner")

OF THE SECOND PART

IN CONSIDERATION of the acceptance of the Owner of the offer of the parties hereto THIS AGREEMENT WITNESSETH THAT THE PARTIES HERETO COVENANT AND AGREE AS FOLLOWS:

Article 1: Work by Contractor

1.1 The Contractor shall:

1. Provide all necessary material, labour, supervision and equipment and perform all work and fulfil everything as set forth and in strict accordance with the Contract Documents and Addenda No. ___ for the project titled “Slope and Drainage Rehabilitation – Range Road 73 and Township Road 493”, which has been prepared by “Senon Engineering, Inc., acting as and hereby titled the Engineer; and

2. Commence the performance of the Contract seven (7) days after Notice to Proceed from the Owner, unless otherwise agreed to by the Engineer, and shall diligently and continuously proceed with the performance thereof so as to complete the Contract to the satisfaction of the engineer by October 15, 2018.

1.2 Time is to be of the essence in this Contract and the completion date(s) set out in this Agreement, Article 1.1, shall be strictly enforced. The Contractor shall pay to the Owner as estimated liquidated damages and not as a penalty, the sum of $500.00 dollars for each day that any portion of the Work remains incomplete after the completion date applicable to it, the sum being a fair estimate of the actual damages the Owner will incur if the Work is not completed by the said completion date. The Owner may, at its sole discretion; set said liquidated damages off against any amounts owing by it to the Contractor.

1.3 If this Contract is extended to cover additional Work to that shown herein, the Contractor shall extend its present Contract Performance Bond and Labour and Materials Payment Bond or provide new ones in an amount as specified in the Supplementary General Conditions.

Article 2: Payment by Owner

2.1 The Owner will, subject to the applicable legislation and the provisions of the Contract Documents in the manner and at the times stipulated in the General Conditions, provide payment to the Contractor for the performance and fulfilment of this Contract, at the unit rates set out in the appropriate schedules in the Tender Form and estimated in the aggregate to be:
($ _____) _____ Dollars

2.2 If a Certificate of Payment has been delivered to the Owner in sufficient time (at least 10 days) for the same to be checked and approved, the Owner shall pay to the Contractor on or before the last day of each calendar month the value of the labour and materials which have been incorporated in the Work at the end of the previous calendar month as estimated by the Contractor and approved by the Engineer less 10% of such payment and less the aggregate of previous payments. The Owner may request confirmation that all Subcontractors and suppliers of materials have been paid prior to processing a payment certificate. If there have been no liens arising out of the performance of the Contract registered against any of the Owner's property and the Contractor has met all the conditions of Article 51 Certificates and Payments of the General Conditions, the Owner shall, 46 days after the issuance of a Construction Completion Certificate, pay to the Contractor the balance due under the Contract. Before making such final payment, the Owner may require a Statutory Declaration or undertaking from the Contract that no such liens exist. If any such liens are registered, the Owner shall require the Contractor to have them removed prior to making final payment to the Contractor, or the Owner may take such steps necessary to have every such lien removed and deduct all expenses attended thereto from the balance owing to the Contractor.

Article 3: Documents Constituting the Contract

3.1 The following documents and drawings (herein collectively called "the Contract Documents") constitute and contain the terms of the Agreement between the parties hereto (herein and in the other Contract Documents sometimes referred to as "the Contract") for the performance of the project for which Bids were called by the Notice to Bidders:

1. Procurement Requirements (Part One)

    1. Certifications and Seals Page
    2. Table of Contents
    3. Invitation to Tender
    4. List of Drawings
    5. Instructions to Bidders
    6. Available Project Information
    7. Tender Form
    8. Agreement Form
    9. General Conditions
    10. Special Provisions

2. Specifications Group (Part Two)

    1. General Requirements
    2. Detailed Specifications
    3. Specification Drawings

3.2 The Contract Documents are complementary and the provisions of each of them are incorporated in this Contract. Terms, shall be deemed to have the same meaning in each of the other Contract Documents unless otherwise defined therein unless the context otherwise requires. Conflicts between any of the Contract Documents shall be resolved as provided in the General Conditions.

Article 4: Rights and Remedies

4.1 No implied contract of any kind whatsoever, by or on behalf of the Owner, shall arise or be implied from anything contained in this Contract or from any position or situation of the parties at any time, it being understood and agreed that the express contracts, covenants, and agreements contained herein and made by the parties hereto are and shall be the only contracts, covenants and agreements on which any rights against the Owner may be founded.

4.2 Subject to Article 3, this Agreement shall supersede all communications, negotiations, and agreements, either written or verbal, made between the parties hereto in respect of matters pertaining to this Agreement prior to the execution and delivery thereof.

Article 5: Succession

5.1 The Contractor and the Owner, their administrators, successors, and assignees hereby undertake and agree to the full performance of their respective obligations under the Contract, and further undertake and agree that the provisions of the Contract, unless it is otherwise agreed between said parties, shall, mutatis mutandis, apply to any extension of the Contract.

Article 6: Receipt of and Addresses for Notices

6.1 Communications in writing between the Contractor and the Engineer shall be deemed to have been received by the addressee on the date of delivery, if delivered by hand to the individual or to a member of the firm or to an officer of the corporation for whom they are intended and if sent by mail, facsimile or similar means, shall be deemed to have been delivered within five working days of the date of posting when addressed as follows:

The Engineer at:

The Town of Drayton Valley
5120 – 52 Street
P.O. Box 6837
Drayton Valley, AB T7A 1A1

The Consultant at:

Senon Engineering Inc.
165 Nash Street
Red Deer, AB T4P 1N3

The Contractor at:

6.2 Provided that if there shall be, at the time of mailing or between the time of mailing and the actual receipt thereof; a mail strike, slowdown, or other labour dispute which might affect delivery by the mail, then such notice, payment, or other communication shall be effective only if actually delivered, sent by facsimile or similar means.

IN WITNESS WHEREOF the parties hereto have caused to be hereto affixed the respective seals attested by the signatures of their respective duly authorized signing officers, as of the day and year first above written.

THE TOWN OF DRAYTON VALLEY

Signature & Capacity of Authorized

Town Official (Town Seal)

CONTRACTOR

Signature & Capacity of Contractor's

Signing Officer (Corporate Seal)

SECTION 00500 – GENERAL CONDITIONS

Article 1 - Definitions

1.1 **Contract** or **Contract Documents** include the Documents and Drawings listed in Section 00400, and modifications thereof or additional drawings and instructions thereto incorporated before execution or agreed to by the parties after execution.

1.2 **Owner** and **Contractor** mean the parties so designated in the Agreement.

1.3 **Engineer** means The Town of Drayton Valley, it's authorized representative or consulting engineer engaged by the Owner to supervise the Work.

1.4 **Subcontractor** or **Fabricator** includes a person, firm, or corporation having a Contract with the Contractor for the execution of a part or parts of the Work included in the Contract, or for the furnishing to the Contractor of materials called for in the Contract.

1.5 **Work** includes all labour and materials required to be supplied or provided by a Contractor, as set out in the Contract Documents, and where the context requires, means a project to which the Contract relates.

1.6 **Other Contractor** means any person, firm, or corporation employed by or having a Contract directly or indirectly with the Owner other than through the Contractor.

1.7 **Conditions** mean these General Conditions and any Supplementary General Conditions.

1.8 **Certificate of Substantial Performance** means a certificate issued by the Contractor or a Subcontractor who is of the opinion that his Contract or Subcontract is substantially performed as contemplated by the Builders' Lien Act, R.S.A. 1980, Chapter B-12 as amended.

1.9 **Certificate of Staged Substantial Performance** means a certificate issued by the Contractor or a Subcontractor who is of the opinion his work as identified under the appropriate schedule is substantially performed as contemplated by the Builders' Lien Act, R.S.A. 1980, Chapter B-12 as amended.

1.10 **Substantial Completion** of the Work shall have been reached when the Engineer certifies that

.1 the Work is ready for use or is being used for the purpose intended; and

.2 the Work remaining to be done under the Contract, inclusive of the cost of any deficiencies, is capable of completion or correction at a cost of not more than:

.1 3% of the first $500,000 of the Contract price;

.2 2% of the next $500,000 of the Contract price;

.3 1% of the balance of the Contract price.

1.11 **Staged Substantial Completion** of the Work shall have been reached when the Engineer certifies that

.1 the Work (identified under the appropriate schedule) is ready for use or is being used for the purpose intended.

1.12 **Substantial Completion Certificate** means a Certificate issued by the Engineer certifying the performance of the Contract meets the requirements of the Builders' Lien Act and that the Work is ready for use as intended. The maintenance period will commence on the date of Substantial Completion.

1.13 **Staged Substantial Completion Certificate** means a Certificate issued by the Engineer certifying the performance of the work identified under the appropriate schedule is ready for use as intended. The maintenance period is not affected in any way by the issuance of the Staged Substantial Completion Certificate and it will still commence on the date of Substantial Completion as identified under clause 1.10.

1.14 **Construction Completion** of the Work shall have been reached when the Engineer certifies that the Work to be done under the Contract; inclusive of all items identified as deficiencies at time of Substantial Completion, but excluding those items arising from the provisions of Article 34 (Warranty and Maintenance) of the General Conditions; has been completed.

1.15 **Construction Completion Certificate** means a Certificate issued by the Engineer certifying the construction completion of the Contract.

1.16 **Final Acceptance** of the Work shall have been reached when the Engineer certifies that the Work to be done under the Contract, inclusive of all items identified as deficiencies during the maintenance period, has been completed.

1.17 **Final Acceptance Certificate** means the Certificate issued by the Engineer certifying the Final Acceptance of the Contract.

1.18 **Changes in the Work** mean the deletion, extension, increase, decrease or alteration of lines, grades, dimensions, methods, Drawings, or materials of the Work or part thereof, within the scope of the Work contemplated by the Contract Documents.

1.19 **Extra Work** means any work or service, the performance of which is beyond the scope of the Work contemplated by the Contract Documents.

1.20 **Specifications** mean Detailed Specifications and Special Provisions.

1.21 **Drawings** means any drawings listed in the Agreement, or included in the Detailed Specifications and Addenda.

Article 2 - Documents

2.1 The Contract Documents shall be executed under seal in duplicate, first by the Contractor and then by the Owner. The intention of the Contract Documents is to include all labour and materials reasonably necessary for the proper execution of the Work. The intention is not, however, that materials or Work not covered by, or properly referable from any section heading or section in the General or Detailed Specifications, will be supplied unless distinctly so noted on the Drawings. Descriptions of materials or Work in words, which so applied have well-known technical or trade meanings, shall be held to refer to such recognized standards.

2.2 In the event of conflicts between Contract Documents, the governing order of documents in descending order, shall be as follows:

.1 Change Orders.

.2 The executed Agreement between the Owner and the Contractor shall govern over all documents.

.3 Addendum.

.4 Available Project Information.

.5 General Conditions.

.6 Detailed Construction Drawings.

.7 Construction Specifications and Standard Drawings.

Notwithstanding the foregoing, documents of later date shall always govern.

In the event of a difference between scaled dimensions on Plans and the figures written thereon, the figures shall govern. In the event that two or more plans show conflicting information, the information on the most recently dated plan shall govern.

2.3 All instructions contained in the Contract Documents are directed to the Contractor unless otherwise specified.

Article 3 - Additional Drawings and Instructions

3.1 When, in the opinion of the Engineer, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further to show any change which may be required, the Engineer will furnish to the Contractor such additional Drawings and instructions to supplement the Contract Documents as may be necessary for the performance of the Work. Such Drawings and instructions shall be consistent with the intent of the Contract Documents. The Engineer shall provide the Contractor with three copies of any additional Drawings and instructions, and they

shall be deemed to have been properly provided to the Contractor if delivered in writing to an individual, to a member of the firm, or to an officer of the Corporation for whom they are intended, or if delivered at or sent by prepaid Single Registered Mail, to the address of the Contractor as set out in the Agreement.

3.2 The Contractor and the Engineer, if either so request, shall jointly prepare a schedule, subject to change from time to time in accordance with the progress of the Work, fixing the dates at which the various additional drawings and instructions will be required, and the Engineer shall furnish them in accordance with the schedule.

Article 4 - Contractor to Check Plans and Data

4.1 The Contractor shall verify all dimensions, quantities, and details described in the Specifications and shown on the Drawings, Additional Drawings, schedules, or other data received from the Engineer or contained in any of the Contract Documents including any addenda, and shall notify the Engineer of all errors, omissions, conflicts, and discrepancies found in any of this material. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction, or improper operations resulting there from, nor from rectifying such conditions at the Contractor's expense. The Contractor will not be allowed to take advantage of any error or omission, as full instructions will be furnished to the Contractor by the Engineer should such error or omission be reported by the Contractor to the Engineer. The Contractor shall assume all responsibility for the estimates of the size, kind, and quantity of materials and equipment required to perform Work pursuant to the Contract.

Article 5 - Copies Furnished

5.1 In addition to an executed copy of the Contract Documents, the Contractor shall purchase as many copies of the Contract Documents and Drawings as are reasonably necessary for the proper execution of the Work.

Article 6 - Shop Drawings

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

6.2 The Contractor shall arrange for the preparation of clearly identified Shop Drawings as called for by the Contract Documents or as the Engineer may reasonably request.

6.3 Prior to submission to the Engineer, the Contractor shall review all Shop Drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue number, and similar data or will do so and that he has checked and coordinated each Shop Drawing with the requirements of the Work and the Contract Documents. The Contractor's review of each Shop Drawing shall be indicated by stamp, date, and signature of a responsible agent or officer of the Contractor.

6.4 The Contractor shall submit Shop Drawings to the Engineer for his review with reasonable promptness and in an orderly sequence so as to cause no delay in the Work of Other Contractors. Work on an item shall not proceed until the Shop Drawings have been approved. If either the Contractor or the Engineer so requests, they shall jointly prepare a schedule fixing the dates for submission and return of Shop Drawings. Shop Drawings shall be submitted in the form of a reproducible transparency or prints, as the Engineer may direct. At the time of submission, the Contractor shall notify the Engineer in writing of any deviations in the Shop Drawings from the requirements of the Contract Documents.

6.5 The Engineer will review and return Shop Drawings in accordance with any schedule agreed upon or otherwise with reasonable promptness, so as to cause no delay. The Engineer's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors and omissions in the Shop Drawings or of responsibility for meeting all requirements of the Contract Documents, unless a deviation on the Shop Drawings has been approved in writing by the Engineer.

6.6 The Contractor shall make any changes to the Shop Drawings, which the Engineer may require, and resubmit same unless otherwise directed by the Engineer. When resubmitting, the Contractor shall notify the Engineer in writing of any revisions other than those requested by the Engineer.

6.7 Shop Drawings will include, but are not limited to:

.1 General arrangements and detailed dimensional drawings that include process, mechanical, electrical and control requirements for the Work and any related critical systems.

.2 Technical specifications for any integrated systems, sub-systems and/or components.

.3 Technical specifications or any services required to allow proper function.

.4 Specifications and recommendations for factory testing, field-testing and performance testing

Article 7 - Ownership of Drawings and Models

7.1 All Drawings, Specifications, models, and copies thereof furnished to the Contractor are the property of the Owner; and if requested by the Owner, they shall be returned upon completion of the Contract. They are not to be used by the Contractor on other work.

Article 8 - Contract Documents on the Work Site

8.1 The Contractor shall keep one copy of the current Contract Documents and Shop Drawings at the place of Work in good order, available to the Engineer and to his representatives.

Article 9 - Local Conditions

9.1 The Contractor shall; by personal inspection, examination, calculations or other tests or by any other means; satisfy himself with respect to the local conditions to be encountered, the quantities, quality, and practicability of the Work, the soil structure and topography at the site, the nature and quantity of materials to be used, the equipment and facilities required throughout all stages of the Work, and all other matters which can in any way affect the Work under this Contract.

9.2 No verbal agreement or conversation with any officer, agent, or employee of the Owner or the Engineer, either before or after the execution of the Contract, shall affect or modify any of the obligations contained in this Article.

Article 10 - Subsurface Conditions

10.1 The Contractor shall promptly notify the Engineer in writing if, in his opinion, the subsurface conditions of the place of the Work differ materially from those indicated in the Contract Documents, or a reasonable assumption of probable conditions based thereon.

10.2 The Engineer will promptly investigate such conditions, and if they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both.

10.3 If the Engineer determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer shall so notify the Owner and the Contractor in writing, stating the reason.

10.4 Claims by either party in opposition to such determination must be made within 21 days after the Engineer has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Engineer for initial determination, subject to further proceedings pursuant to Article 23 (Disputes).

Article 11 - Engineer and Contractor

11.1 The Engineer will provide administration of this Contract, as described in the Contract Documents.

11.2 The Engineer will be the Owner's representative during construction and until the issuance of the Final Acceptance Certificate. The Owner's instructions to the Contractor shall be forwarded through the Engineer. The Engineer will have authority to act on behalf of the Owner, only to the extent provided in the Contract Documents or otherwise in writing. The Engineer will have the authority to stop the Work whenever such stoppage may be necessary, in his opinion, to ensure the proper execution of the Work in accordance with the provisions of this Contract.

11.3 If, at any time, the Engineer is of the opinion that there exists a danger to life or to property, he may order the Contractor to stop Work or to take such remedial measures, as he may consider necessary. The Contractor shall obey such orders immediately. Neither the giving nor the carrying out of such orders shall thereby entitle the Contractor to any extra payment.

11.4 The Engineer is the sole interpreter of the Contract and the judge of its performance. The Contractor shall obey, perform, and comply with the Engineer's orders or instructions with respect to the Work or concerning the conduct thereof, promptly, efficiently, and to the satisfaction of the Engineer. However, if the Contractor is of the opinion that such orders or instructions are not authorized under the provisions of the Contract or involve a change for which a change order should be issued as described in Article 46 (Changes in Work), he shall so notify the Engineer in writing before proceeding to carry them out and, in any event, within 10 days of the receipt of such orders or instructions. If the Contractor does not notify the Engineer within the requested time, he shall not claim at any time thereafter that the orders or instructions were not authorized or should have been subject to a change order. Nevertheless, the giving of such notices to the Engineer shall not relieve the Contractor of his obligations to carry out and obey such orders and instructions.

11.5 The Engineer will not be responsible for or be deemed to have control over the acts or omissions of the Contractor, his Subcontractors, or their agents, employees, or other persons performing any of the Work.

11.6 The Engineer will have authority to reject Work, which in his opinion, does not conform to the requirements of the Contract Documents. Whenever he considers it necessary or advisable, he will have authority to require special inspections or testing of Work whether or not such Work be then fabricated, installed, or completed. However, neither the Engineer's authority to act, nor any decision made by him, either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, his Subcontractors, or their agents, employees or other persons performing any of the Work.

11.7 Nothing contained in the Contract Documents shall create any contractual relationship between the Engineer and the Contractor, his suppliers, or their agents, employees or other persons performing any of the Work.

11.8 The Engineer or the Owner may appoint any person or corporation or an employee of such person or corporation to be an Inspector. Such Inspector shall have the authority of the Engineer to reject materials, procedures, or workmanship as not complying with the provisions of the Contract and to order the Contractor to stop Work until the materials, procedures, or workmanship comply with such provisions.

Article 12 - Inspection of Work

12.1 The Contractor shall allow the Engineer and/or Owner, or their duly appointed Inspector, access and provide adequate facilities for access to any part of the Work at all times. If the Contract

Documents, Engineer's instructions, laws, ordinances, or any public authority require any Work to be specifically tested or approved, the Contractor shall give the Engineer at least five days advance notice of his preparedness for such inspections, and if the inspection is by an authority other than the Engineer, the Contractor shall give the Engineer at least five days notice of the date fixed for such inspection.

12.2 The Engineer will inspect the Work promptly and without causing unreasonable delay to the Contractor. Neither extra payment nor extension of time of completion will be allowed to the Contractor for delay caused by any inspection.

12.3 Upon the request of the Engineer, the Contractor shall open up for inspection any part of the Work that has been covered up. If the Contractor refuses to comply with such request, the Owner may employ other persons to uncover the Work. If the Work is found to be in accordance with the Contract requirements, the cost of uncovering and recovering the Work shall be borne by the Owner. If any of the Work was found not to be in accordance with the Contract requirements, then the cost of uncovering and recovering the Work shall be charged to the Contractor.

Article 13 - Use of Premises

13.1 The Contractor shall confine his equipment and apparatus, the storage of materials, and the operations of his Workmen to limits set by the common law by applicable statutes of Alberta and Canada and regulations made thereunder by local by-laws or by permits and directions of the Engineer. The Contractor shall not unreasonably encumber the premises with the materials.

13.2 The Contractor shall not permit any part of any structure to be loaded with a weight, which will endanger its safety.

13.3 The Contractor shall enforce the Engineer's instructions regarding signs, advertisements, fires, and smoking.

Article 14 – Records Open for Inspection

14.1 The Contractor’s payroll, time record, invoices, statements, and any other financial documents, data, records, which may, in the Owner’s opinion, have any relation to the Contract, shall be at all times open for inspection and copying by the Owner. The Contractor shall assist the Owner in every possible way in this inspection.

Article 15 - Assignments

15.1 The Contractor shall not assign this Contract or any portion thereof without the written consent of the Owner.

Article 16 - Owner's Right to Do Work

16.1 If the Contractor should neglect to execute the Work properly or fail to perform any part of this Contract, the Owner, after three days' written notice to the Contractor, may without prejudice

to any other remedy it may have, make good any deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor; provided, however, that the Engineer shall have approved both such action and the amount charged to the Contractor.

Article 17 - Owner's Right to Terminate Contract

17.1 If the Contractor at any time becomes bankrupt, makes an assignment of his property to the benefit of his creditor, or if a receiver or liquidator should be appointed on account of his insolvency, the Owner shall have the right to terminate this Contract immediately. Such termination shall be effective upon notice of same to the Contractor.

17.2 If at any time the Engineer is of the opinion and so states in writing to the Owner, that the Contractor:

.1 has failed to commence Work or recommence Work after a suspension within the time specified in the Contract Documents;

.2 has failed or is failing to furnish or to maintain a detailed Work schedule and plan of operation as required;

.3 has failed or is failing to use diligence or has failed to comply with the instructions of the Engineer to expedite his Work, or is otherwise failing to make such progress with the Work as is necessary to ensure the completion of the Work or any part thereof in the time specified in the Contract Documents;

.4 has failed or is failing to supply enough competent Workmen, management, materials, or suitable equipment; or

.5 has become in any way unable to carry out the Work or any part thereof;

the Owner may give notice in writing to the Contractor of such opinion and require that any such default or defaults be remedied forthwith. If, within 10 days of such notice, the default or defaults are not remedied to the satisfaction of the Engineer, the Owner may, without prejudice to any other right or remedy he may have, terminate the Contract. Such termination shall be effective immediately.

17.3 Upon such termination, the Contractor shall leave the place of Work at the Owner's request and the Owner may employ such means as he may see fit to complete the Work. In such cases

.1 the Contractor shall have no claim for any further payment in respect of Work performed, but shall be liable for all damages and expenses which may be suffered by the Owner by reason of such default or delay and the non-completion by the Contractor of the Work;

.2 no objection of claim shall be raised by the Contractor despite the fact that the ultimate cost to complete the Work is, in the opinion of the Contractor, greater than it should

have been;

.3 all materials and all rights, proprietary or otherwise, licenses, powers, and privileges; whether relating to or affecting real or personal property, acquired, possessed, or provided by the Contractor for the purposes of the Work under the provisions of this Contract; will become or remain the property of the Owner for any and all purposes incidental to the completion of the Work and be used, exercised, and enjoyed by the Owner as fully to all intents and purposes connected with the Work as they might therefore have been used, exercised, and enjoyed by the Contractor;

.4 the Owner may forthwith enter into possession of any or all of the Contractor's equipment at the place of the Work and may use the same in any way he sees fit in order to complete the Work without the Owner being in any way liable for damages or other costs in connection with such use by the Owner. Upon completion of the Work, such equipment may be returned to the Contractor or may be sold by the Owner and the net proceeds of such will credit to the Contractor's account.

17.4 If the Contractor's right to perform the Work is terminated in accordance with the provisions of this Article, the Contractor shall not be entitled to receive any further payment until the Work is completed. Upon completion of the Work, the Engineer shall determine

.1 the amount which would have been due to the Contractor under the Contract if all of the Work had been performed by him;

.2 the costs and expenses borne by the Owner in completing the Work and damages for delay in completion, if any.

The Contractor shall be entitled to receive the balance of the Contract price less such costs and expenses. If such costs and expenses exceed the Contract price, the Contractor shall pay the amount of such excess to the Owner on demand.

17.5 The Owner shall have the option, under the provisions of this Article, to be exercised in its absolute discretion, to terminate the right of the Contractor to perform any part or parts of the Work and to permit the Contractor to continue to perform the rest of the Work. All the provisions of this Article shall comply to such part or parts with such modifications as the circumstances may require.

Article 18 - Contractor's Right to Terminate Contract

18.1 If the Work should be stopped or otherwise delayed for a period of Thirty (30) days or more under an order of a Court or other public authority and providing that such Order was not issued as a result of an act or fault of the Contractor, or anyone directly or indirectly employed or engaged by him, the Contractor may, without prejudice to any other right of remedy he may have, by giving the Owner written notice, terminate the Contract.

18.2 The Contractor may notify the Owner in writing, with a copy to the Engineer, that the Owner is in default of his contractual obligations if

.1 the Engineer fails to issue a Certificate in accordance with the provisions of Article 51 (Certificates and Payments); or

.2 the Owner fails to pay the Contractor in accordance with the provisions of Article 51 (Certificates and Payments) and Section 00400, Article 2.

18.3 The Contractor may terminate the Contract if the Owner or Engineer have not remedied the default of their contractual obligations within 30 days after receipt of notice described under the provisions of this Article.

Article 19 - Separate Contracts

19.1 The Owner reserves the right to let other contracts in connection with the undertaking of which the Work is a part, and the Contractor shall connect properly and coordinate this Work with that of Other Contractors. If any part of the Contractor's work depends for its proper execution or results upon the work of another contractor, the Contractor shall report promptly to the Engineer any defects in the work of such Other Contractor that may interfere with the proper execution of the Contractor's work. Should the Contractor fail so to inspect and report, he shall have no claim against the Owner because of the defective or unfinished Work of any Other Contractor, except due to latent defects not reasonably noticeable at the time of the commencement of the Contractor's work.

Article 20 - Subcontracts

20.1 The Subcontractors named in the Appendices attached to the Tender Form and others as may be approved by the Engineer following execution of the Agreement, shall not be changed nor shall additional Subcontractors be employed without the prior written consent of the Engineer.

20.2 The Contractor is responsible to the Owner for the acts and omissions of its Subcontractors and of their employees, to the same extent that he is responsible for the acts, omissions, and persons employed by himself. Nothing in the Contract Documents shall create any contractual relation between a Subcontractor and the Owner.

20.3 The Contractor shall bind every Subcontractor to the terms of the Contract Documents.

Article 21 - Mutual Responsibility of Contractors

21.1 Should the Contractor suffer damage by an act or omission of any Other Contractor employed by the Owner upon the Work, the Contractor shall make his claim in writing against the Owner through the Engineer within 48 hours after the happening of the event causing such damage to the Contractor, and the Engineer shall decide upon all claims made against the Owner under this Section and shall certify the same to the Owner.

21.2 Should the Contractor cause damage to any Other Contractor on the Work, the Contractor shall, upon notice by the Owner, settle with such Other Contractor by agreement if he will so settle. If such Other Contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall defend such proceedings at his own expense; and if any judgement against the Owner arises therefore, the Contractor shall be responsible and pay the amount of such judgement and all costs incurred by the Owner.

Article 22 - Payments by Contractor

22.1 The Contractor shall promptly pay all amounts due to any Subcontractor engaged by the Contractor for or in connection with the performance of this Contract, or for buildings or structures erected by or for the Contractor in the performance of the Contract and any supplies used in, upon, in respect of, or about the Works or any portion thereof, and shall indemnify and save harmless the Owner from and against any charge or claim in any way connected with the foregoing. The Labour and Materials Bond furnished by the Contractor shall be so drawn as to cover the obligation of the Contractor with respect thereto.

Article 23 - Disputes

23.1 Any difference between the parties to the Contract as to the interpretation, application, or administration of this Contract or any failure to agree where agreement between the parties is called for (hereinafter referred to as "Disputes"), which are not resolved in the first instance by decision of the Engineer, shall be settled in accordance with the following provisions:

.1 The claimant shall give written notice of such Dispute to the other party no later than 30 days after the receipt of the Engineer's decision. Such notice shall set forth particulars of the matters in Dispute, the probable extent and value of the damage, and the relevant provisions of the Contract Documents. The other party (hereinafter referred to as the "Respondent"), shall reply to such notice no later than 14 days after its receipt, setting out in such reply his grounds and other relevant provisions of the Contract Documents;

.2 If the matter in Dispute is not resolved promptly, the Engineer will give such instruction as, in his opinion, is necessary for the proper performance of the Work and to prevent delays pending settlement of Dispute. The parties shall act immediately according to such instructions; it being understood that by doing so, neither party will jeopardize any claim they 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 such costs incurred by the Contractor in carrying out such instructions which he was required to do beyond what the Contract Documents correctly understood and interpreted would have required him to do;

.3 If the matter or matters are not resolved within 10 days after the Respondent files his reply; the parties agree that the matter in Dispute shall be submitted to arbitration pursuant to the Arbitration Act of Alberta.

23.2 No act by either party shall be construed as a renunciation or waiver of any of his rights or resources, provided that he has given the notices and carried out any instructions contemplated above.

Article 24 - Oral Agreements

24.1 No oral instructions, objections, claims, or notices by any party to the other shall affect or modify any of the terms or obligations contained in any of the Contract Documents, and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other then by waiver or modification thereof in writing and agreed to by the parties hereto.

Article 25 - Non-Waiver

25.1 Any failure by the Owner or the Engineer at any time, or from time to time, to enforce or require the strict compliance of any of the terms or conditions of the Contract, will not constitute a waiver of such terms or conditions and will not affect or impair such terms or conditions in any way or the right of the Owner or the Engineer at any time to avail himself of any further available remedies.

Article 26 - Right of Set Off

26.1 The parties agree, that if at any time the Contract Documents indicate that any Work is to be performed or anything is to be done at the expense of the Contractor, and if at any time it is necessary for the Owner to incur costs and expenses which are to be borne by the Contractor pursuant to the Contract Documents, then the Owner shall be at liberty to set off and deduct the amount of such costs and expenses from any monies then or thereafter owing to the Contractor.

Article 27 - Use of Completed Portions

27.1 The Owner shall have the right to take possession of and use any completed portions of the Work, notwithstanding that the time for completing the entire Work may not have expired, but such taking possession of and use shall not be deemed an acceptance of any Work not in accordance with the Contract Documents. If such prior use delays the Work, the Contractor will be entitled to such extension of time as the Engineer may determine in accordance with Article 45 (Delays). No such extension of time shall entitle the Contractor to damages for such delay.

Article 28 - Contractor's Foreman or Superintendent

28.1 The Contractor shall keep on the Work site at all times during its progress, a competent Foreman or Superintendent. The Foreman or Superintendent shall represent the Contractor in his absence, and directions given to him shall be held to be given to the Contractor. Important directions given to the Contractor by the Engineer shall be in writing. The Superintendent or Foreman shall give efficient and effective supervision to the Work until its completion.

28.2 Unless the Foreman or Superintendent ceases to be in the employ of the Contractor, he shall not be changed except with the consent of the Engineer.

Article 29 - Materials and Employees

29.1 Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labour, tools, equipment, water, heat, light, power transportation, and other facilities necessary for the performance of the Work in accordance with the Contract.

29.2 Materials provided shall be new, unless otherwise specified. Materials, which are not specified, shall be of a quality best suited to the purpose required and their use subject to the approval of the Engineer.

29.3 The Contractor shall maintain good order and discipline among his employees engaged on the Work. The Engineer shall be at liberty to require the Contractor to remove forthwith from the Work any person employed by the Contractor in or about the execution or maintenance of the Work, who, in the opinion of the Engineer, is incompetent or unsatisfactory in any way, and such person shall not be again employed upon the Work, without the written permission of the Engineer.

Article 30 - Tools, Plant, and Equipment

30.1 If, at any time before the commencement or during the progress of the Work; tools, plant, or equipment appears to the Engineer to be insufficient or inappropriate to secure the quality of Work required, or at the proper rate of progress, the Engineer may order the Contractor to make such changes as may be necessary. The failure of the Engineer to demand such changes shall not relieve the Contractor of his obligation to secure the quality of Work and rate of progress necessary to complete the Work within the time required by this Contract and to the satisfaction of the Owner.

Article 31 - Workers' Compensation Insurance

31.1 The Contractor shall maintain an account in good standing covering all activities of the Contractor and pay all assessments thereunder.

31.2 The Contractor shall comply with all requirements of the Workers' Compensation Act of Alberta and any regulations applicable thereto and without restricting the generality of the foregoing, the Contractor shall adhere to any safety regulations governing the Work.

31.3 Notwithstanding any other provisions of the Contract Documents, if the Workers' Compensation Board orders the Contractor to cease work, the Owner, on 24 hours written notice from the Engineer to the Contractor, may terminate this Contract.

31.4 Prior to receiving payment for Substantial Completion of the Work, or at any time during the term of the Contract, when requested by the Owner, the Contractor shall provide evidence of compliance with the requirements of the applicable Workers' Compensation legislation.

Article 32 - Materials Testing and Mix Designs

32.1 The Contractor shall furnish, at his expense, the Engineer with material tests and mix designs, except as otherwise specified in the Contract Documents.

Article 33 - Rejected Work

33.1 All materials which have not conformed to the requirements of the Contract Documents and which are not approved by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, will be rejected.

33.2 Any defective work; whatever the cause thereof and without limiting the generality of the foregoing, whether the result of poor workmanship or use of defective materials; shall be removed within 10 days after written notice has been given by the Engineer, and the Work shall be re-executed by the Contractor. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance.

33.3 The removal of work and the re-execution thereof shall be at the expense of the Contractor and he shall pay the cost of replacing the Work which shall include all materials destroyed or damaged by the removal of the rejected Work, or materials and the subsequent replacement with acceptable Work. The Contractor shall also reimburse the Owner for any additional engineering, inspection, testing, or other costs incurred in respect of rejected work or materials, whether such work or materials are replaced or not, or are acceptable at a lower price.

33.4 If, in the opinion of the Engineer, it is not expedient to re-execute defective Work, the Owner may deduct from the Contract price the difference in value between the Work as done and that called for by the Contract, the amount of which shall be determined by the Engineer.

Article 34 - Warranty and Maintenance

34.1 The Contractor agrees to correct promptly, at his own expense, defects or deficiencies in the Work which appear prior to and during the two year period from the date of issue of the Substantial Completion Certificate, and the Contractor further agrees to correct or pay for any damage to other work resulting from the said defects or the correction thereof.

34.2 The Owner or the Engineer shall promptly notify the Contractor of any defects, and the Contractor shall within 10 days perform the necessary work to correct the defect. In the event that this work is not done by the Contractor within the 10 day period, or such further period as approved by the Engineer, the Owner may perform or cause to be performed the necessary work and shall notify the Contractor accordingly.

34.3 All cost and expenses incurred in correcting any defects which appeared prior to and during the two year maintenance period; whether performed by the Contractor, his representative, or the Owner or its representatives; shall be borne by the Contractor. The Contractor shall, in addition, be liable to the Owner for all expenses, losses, or damage incurred by the Owner as a result of such faulty materials and defective workmanship as described in this Article or as a result of the

Contractor's failure to correct the defects as specified herein, including but not restricted to all extra engineering costs, inspection, and testing the work.

34.4 Neither the Final Certificate of Payment, Substantial Completion Certificate or Construction Completion Certificate, nor any payment made thereunder by the Owner, shall relieve the Contractor of his responsibilities for faulty materials or defective workmanship.

Article 35 - Protection of Work and Property

35.1 The Contractor shall protect the Work, the Owner's property, and the property adjacent to the place of the Work from damage and shall be responsible for damage which may arise as a result of his operations or the operations of his Subcontractors under the Contract, and without restricting the generality of the foregoing, the Contractor shall; in carrying out any ditching or excavation operations; take precautions to prevent subsidence or withdrawal of support of sidewalks and curbs, roadways, structures, and existing utilities.

35.2 The Contractor shall be responsible for all loss and damage whatsoever which may occur on or to the Works, completed or otherwise, until such time as the entire Works have been totally completed as certified by the Engineer. In the event of any damage or injury caused by the Contractor in the performance of this Contract, to the Work, the Owner's property or property adjacent to the place of Work, the Contractor shall be responsible for the making good of such damage at his expense.

Article 36 - Indemnity

36.1 The Contractor shall indemnify and save harmless the Owner and Engineer from and against all losses and claims, demands, payments, actions, recoveries, and judgements of every nature and description brought or recovered against him and/or the Owner or Engineer, by reason of any act or omission or alleged act or omission of the Contractor, his agents, employees, or Subcontractors in the execution of the Work.

Article 37 - Performance Bond, Labour and Materials Bond, and Maintenance Bond

37.1 To ensure the faithful execution and proper fulfilment of this Contract and to ensure the proper maintenance of the Works, the Contractor shall provide the Owner with a Performance Bond and a Labour and Materials Payment Bond, each for the amount of 50% of the Contract amount including GST.

37.2 When required, the Contractor shall provide a Maintenance Bond or Irrevocable Letter of Credit for any work having a maintenance period beyond the two-year maintenance period specified in Article 34.1. The Maintenance Bond amount shall be in the amount of 50% of the cost of the Work extending beyond the two-year period.

37.3 The above described Bonds must be issued by a Surety Company licensed to conduct business in the Province of Alberta, and shall be provided to the Owner. Notwithstanding any other provisions of the Contract Documents, the Owner shall not be required to make any payment

whatsoever to the Contractor until the above Bonds, duly executed, have been delivered to the Owner.

Article 38 - Contractor's Insurance

38.1 Without in any way limiting the obligations or liabilities of the Contractor, the Contractor shall maintain and keep in force during the term of this Contract until the date of issuance of the Construction Completion Certificate, with an Insurance Company or Companies and under policies of insurance acceptable to and approved by the Owner, the following project based insurance with limits not less than that drawn hereunder. When changes in the Contract are material to the risk the Contractor shall notify the Insurance Company and the Surety.

.1 Commercial / General Liability insurance in an amount not less than $2,000,000 per occurrence and $5,000,000 in the aggregate amount.

.2 Automobile Liability insurance in an amount not less $2,000,000 per occurrence.

.3 Excess / Umbrella Liability insurance in an amount not less than $2,000,000 per occurrence.

38.2 The Contractor shall be solely responsible for payment of every deduction amount provided in any policy of insurance furnished pursuant to this Article. Any deductible amount must be disclosed by the Contractor and stated on the certificate upon submission.

38.3 The Contractor shall furnish, to the Owner prior to commencing any Work under the Contract, a certified copy of each policy or policies evidencing such insurance including a certified copy of every endorsement thereto, or a Certificate of Insurance.

38.4 The Contractor shall furnish endorsements to such policies capable at law of being so endorsed, as follows:

.1 Providing that said insurance shall not be cancelled by the Contractor or the insurer, or modified to reduce or remove coverage afforded to the Owner or otherwise prejudice the Owner without 30 days written notice by registered mail to the Owner.

.2 Providing all policies shall name the Owner as additional insured in the policies provided hereunder.

Article 39 - Patent Fees

39.1 The Contractor shall pay all royalties and license fees and shall indemnify and save the Owner harmless from loss on account of suits or claims which may arise by reason of the Work, for infringement of patents in force at the time of or after the signing of the Contract Documents.

Article 40 - Laws, Notices, Permits, and Fees

40.1 The Work shall be done in accordance with the laws of the Province of Alberta, and any Federal

and/or local regulations and by-laws governing the various phases of the Work.

40.2 It is the responsibility of the Contractor to obtain the permits, licenses, and certificates and to pay the fees related thereto necessary to properly perform the Work; however, this shall not include the obtaining of permanent easements or rights of servitude.

40.3 The Contractor shall give the required notices and comply with the laws, ordinances, rules, regulations, codes, and orders of the authorities having jurisdiction which are in force during the performance of the Work, which relate to the preservation of the public health and to construction safety. The Contractor shall post and maintain, for the duration of the Work, a Safety Notice, in a prominent location on the construction site.

40.4 If the Contractor becomes aware that the Contract Documents are at variance or contrary to any laws, ordinances, rules, regulations, codes, and orders of the authorities having jurisdiction, and the Contractor fails to notify the Engineer in writing and obtain his direction immediately, the Contractor shall be responsible for and shall correct the violations thereof and shall bear the cost, expense, and damages attributable to his failure to comply with the provisions of such laws, ordinances, rules, regulations, codes, and orders.

Article 41 - Taxes and Duties

41.1 Unless otherwise stated in the Contract Documents, the Contractor shall pay the applicable Government sales taxes, customs, duties and excise taxes, which might arise in the performance of the Contract. Any rebate of the Federal Goods and Services Tax shall accrue to the Owner.

Article 42 - Injury or Damage to Persons or Property

42.1 The Contractor shall use due care and take all necessary precautions to ensure the protection of persons and property, and shall comply with the provisions of the Workers' Compensation Act of Alberta. The Contractor shall be liable for any and all injury or damage which may occur to persons or property due to any act, omission, neglect, or default of the Contractor or his employees, workman or agents.

42.2 The Contractor shall, without further order, provide and maintain at all times during the progress or suspension of the Work, suitable barricades, fences, signs, signal lights, and flagmen as are necessary to ensure the safety of the public and of those engaged in the Work.

42.3 Notwithstanding any other provisions contained in the Contract Documents, in an emergency affecting the safety of life of the Works, or of an adjoining property; the Contractor, without the necessity of authorization from the Engineer, shall act in a reasonable manner to prevent loss or injury. The Contractor shall not be entitled to any extra compensation for actions taken in such an emergency situation unless, in the opinion of the Engineer, extra compensation is justified.

42.4 The Work shall be carried out in a manner that will cause the least interruption to vehicular and pedestrian traffic. Where work has to be carried out on highways or properties other than those

of the Owner, the Contractor shall familiarize himself with the requirements of the Owner and controllers of those highways or properties which pertain to traffic control and safety or which place limitations on the Work and shall comply with such requirements.

Article 43 - Failure to Complete on Time

43.1 Should the Contractor fail to complete the Work under this Contract within the time specified, the Owner shall be entitled to make deductions from payments due the Contractor to compensate himself for the following:

.1 Loss of revenue during the extra time required to complete the Contract, if the completed project is revenue-producing. This loss shall, where the same is available, be calculated on the basis of the approved schedule of rates, rents, tolls, and/or property assessments established by the Owner.

.2 The cost of engineering services and associated expenses incurred during the extra time required to complete the Contract.

.3 Any cost incurred by the Owner, resulting from the loss of use of the project, during the extra time required to complete the Contract.

Article 44 - Progress Schedule

44.1 To enable the Work to be laid out and prosecuted in an orderly and expeditious manner, the Contractor, within 15 days after the award of this Contract, shall, unless otherwise directed by the Engineer, submit to him a proposed schedule showing the anticipated time of commencement and completion of each of the various operations to be performed under this Contract; together with all necessary and appropriate information regarding sequence and correlation of Work, and an estimated time required for delivery of all materials and equipment required for the Work. At the same time, he shall also submit a description of the construction equipment he proposes to place in the Work. The proposed schedule and machine force shall be revised as directed by the Engineer until finally approved by him; and after such approval, shall be strictly adhered to by the Contractor, unless, upon written permission of the Engineer, it is changed.

If the Contractor fails to adhere to the approved progress schedule, he must promptly adopt such other or additional means and methods of construction that will make up for the time lost and will assure completion in accordance with such schedule.

Article 45 - Delays

45.1 If the Contractor is delayed in the completion of the Work; by any act or omission of the Owner, the Engineer, Other Contractor, or anyone employed or engaged by them, or by changes ordered in the Work; then the time of completion shall be extended for such reasonable time as the Engineer may decide. If the Contractor is delayed in completion of the Work by labour disputes, strikes, lockouts (including lockouts decreed or recommended by a recognized

contractors' association for its members of which the Contractor is a member), fire, unusual delay by common carriers, unavoidable casualties, or by any cause of any kind whatsoever beyond the Contractor's control, then at the Engineer's discretion, the time of completion shall be extended for a period of time equal to the time lost due to such delays.

45.2 Inclement weather shall not be a prima facie reason for the granting of an extension of time, and the Contractor shall make every effort to continue work under the prevailing conditions. The Owner may, however, grant an extension of time if an unavoidable delay as a result of inclement weather in fact occurs. An “inclement” weather day is defined as a day on which the Contractor is prevented by inclement weather or conditions resulting therefrom, from proceeding with at least 75% of the normal labour and equipment force for at least 75% of the normal work day being spent on an operation or operations which control the Contract schedule.

45.3 No extension shall be made for delay unless written notice of claim is given to the Engineer not later than 7 days after the commencement of delay; providing, however, that in the case of the continuing cause of delay, only 1 notice of claim shall be necessary.

Article 46 - Changes in Work

46.1 The Engineer, without invalidating the Contract, may make changes by altering, adding to, or deducting from the Work, the Contract price being adjusted accordingly. All such work shall be done under the provisions of the original Contract, except that any claim for extension or reduction of time caused thereby shall be adjusted at the time of ordering such change.

46.2 No change shall be made except on written order from the Engineer and no claim based on an addition to or deduction from the Contract price shall be valid unless so ordered.

Article 47 - Valuation of Changes

47.1 If, in the opinion of the Engineer, any change referred to in Article 46 affects the Contract price, adjustments will be made at the time of the ordering of the changes. The value of the addition or deduction from the Contract price shall be decided by the Engineer. The Engineer will use one or more of the following methods in deciding such value:

.1 By estimate and acceptance in a lump sum;

.2 By unit prices agreed upon in the Contract Documents or in writing by the parties;

.3 By cost and percentage on force account work;

.4 By variation of the Contract unit price.

47.2 The following percentage mark-ups shall be applied to authorized extra work determined by the method outlined in 47.1.3:

.1 Contractor on His Own Work

Ten percent for overhead and profit on the total actual cost of material. Labour rates shall be quoted as an hourly rate and shall be full compensation for profit and overhead, including Workers' Compensation, holiday pay, and Unemployment Insurance.

.2 Subcontractor's on Their Own Work

Ten percent for overhead and profit on the total actual cost of material. Labour rates shall be quoted as an hourly rate and shall be full compensation for profit and overhead, including Worker's Compensation, holiday pay, and Unemployment Insurance.

.3 Contractor on Subcontractor's Work

Five percent on the total of the approved Subcontractor's quotation, excluding equipment rentals.

47.3 Rental rates on equipment shall be paid hereinafter set out in Article 48 (Force Account Rates).

47.4 When a change in the Work is proposed or required, the Contractor shall present to the Engineer, for approval, his claim for a change in the Contract price and change in Contract time with appropriate documentation in a form acceptable to the Engineer. The Engineer will satisfy himself as to the correctness of such claim and when approved by the Owner, a change order shall be issued to the Contractor amending the Contract price and Contract time as appropriate. The value of work performed in the change shall be included for payment with the regular certificates for payment.

47.5 In the case of changes in the Work to be paid for pursuant to methods 47.1.2 and 47.1.3 above, the form of presentation of costs and methods of measurement shall be prescribed by the Engineer before proceeding with the change. The Contractor shall keep accurate records of any quantities or costs and present an account of the cost of the change in the Work, together with vouchers and receipts.

47.6 If the method of valuation, measurement, change in Contract price, and change in Contract time cannot be promptly agreed upon and the change is required to be proceeded with, then the Engineer, in the first instance, will determine the method of valuation, measurement, the change in Contract price and Contract time, subject to final determination in the manner set out hereinafter in Article 23 (Disputes). In this case, the Engineer will, with the consent of the Owner, issue a written authorization for the change setting out the method of valuation and if by lump sum, his valuation of the change in Contract price and Contract time.

47.7 In the case of a Dispute of the valuation of a change authorized in the Work and pending final determination of such value, the Engineer will certify the value of the Work performed in accordance with his own valuation of the change and include the appropriate amount with the regular certificates for payment. The Contractor shall keep accurate records of quantities and

costs of such work.

47.8 Should the actual quantity of an item in the Tender Form vary by more than 15% of the estimated quantity, either the Owner or the Contractor may request a revision of the Contract unit price contained in the Tender Form. Such a request for a revision in a Contract unit price shall be given as soon as reasonably possible after the party concerned becomes aware of the circumstances.

47.9 If a revision to a Contract Unit Price is negotiated, then

.1 the revised unit price in the case of a decrease of more than 15% of the estimated quantity, will apply to the actual work performed for that item; and

.2 the revised unit price, in the case of an increase of more than 15% of the estimated quantity, will apply to the quantity of work in excess of the estimated quantity for that item only.

47.10 If either party requests renegotiation of a Contract unit price, both parties agree to act promptly in order to arrive at an equitable revision of the Contract unit price prior to proceeding with the Work so affected. If agreement of such renegotiation cannot be reached, the Contractor shall proceed with the Work and the matter shall be subject to final determination in the manner set out in Article 23 (Disputes). Pending such settlement, payment for the work performed shall be made on the regular certificates for payment on the basis of the Contract unit prices.

47.11 In all matters relating to valuation and certification of changes in the Work, both the Contractor and the Engineer shall act promptly.

Article 48 - Force Account Rates

48.1 Force account records shall be submitted daily. No claim for force account work or payment thereunder shall be made for force account records not submitted in accordance with this Article. The submission to, acceptance by, or approval by the Engineer of daily force account records shall not at any time be deemed to be admission that the Work is properly chargeable to force account.

48.2 Unless otherwise specified in the Contract Documents, rental rates for Contractors' equipment for force account work shall be in accordance with the current rates as administered by Alberta Road Builders and the Heavy Construction Association. All rates include overhead, profit, operator's wages, fuel, oil, repairs, servicing, and all other incidentals. Rental rates will be paid only for the actual time equipment is used under force account, and no stand-by time will be allowed for other equipment not required during this period.

48.3 If the Contract is not completely performed within the time specified in the Contract Document, the force account rates shall be the rates that were in effect up to the original date of completion.

Article 49 - Disposition of Provisional Cost Sum and Contingency Sum

49.1 No portion of the provisional cost sums or contingency allowances set out in the Tender Form shall be allotted to the performance, the correction or replacement of any work which the Contractor is required to do under the terms of the Contract Documents. In the event there are changes, modifications, or alterations made in any of the Contract Documents or by additional instructions that would lead to an increase in the total costs of the Work, and if such changes have been approved by the Engineer and are chargeable to the Owner, then such amount shall first be set off against the provisional cost sums and contingency allowances set out in the Tender Form. Unless there are extra-approved expenditures pursuant to the provisions of these General Conditions, the Contractor shall have no right to or claim against any part of the provisional cost sums and contingency allowances.

Article 50 - Applications for Payments

50.1 Applications for payment on account may be made monthly as the Work progresses. Applications for payment shall be dated the last day of the agreed monthly payment period and the amount claimed shall be for the value, proportionate to the amount of the Contract, of Work performed, and materials delivered to the place of work at that date.

50.2 The Contractor shall submit to the Engineer, at least 14 days before the first application for payment, a balanced schedule of values of the various part of the Work, aggregating the total amount of the Contract price so as to facilitate evaluation of applications for payment. This schedule shall be made out in such form and supported by such evidence as to its correctness as the Engineer may require; and when approved by the Engineer, it shall be used as the basis for applications for payment, unless it is found to be in error.

50.3 When making applications for payment, the Contractor shall submit a statement based upon the schedule, together with a Statutory Declaration, in the form provided in Section 00 60 00.08. Such evidence shall support claims for materials delivered to the place of work, but not yet incorporated into the Work, as the Engineer may reasonably require establishing the value of the materials.

50.4 Applications for release of holdback monies following Substantial Completion of the Work and the application for final payment following issuance of the Construction Completion Certificate shall be made at the time and in the manner set forth in Article 51 (Certificates and Payments).

Article 51 - Certificates and Payments

51.1 The Engineer will, no later than 10 days after the receipt of an application for payment from the Contractor submitted in accordance with Article 50 (Applications for Payments), issue a certificate for payment in the amount applied for or in such other amount as the Engineer determines to be properly due. If the Engineer amends the application, he will promptly notify the Contractor in writing giving his reasons for the amendment.

51.2 The Owner shall make prompt payment to the Contractor on account, in accordance with the provisions of Section 00400, Article 2.

51.3 The Owner acknowledges that the Contractor or any Subcontractor has the right to issue a Certificate of Substantial Performance, in accordance with the Builders' Lien Act; however, notwithstanding such right, the Engineer shall, no later than 10 days after the receipt of an application from the Contractor for a Substantial Completion Certificate of the Work, make an inspection and assessment of the Work to verify the validity of the application. The Engineer shall, no later than seven days after his inspection, notify the Contractor of his approval or the reasons for his disapproval of the application. If the Substantial Completion Certificate is to be issued, the list of possible deficiencies shall be attached to the Certificate. The date of Substantial Completion of the Work shall be stated in the Certificate. Immediately following the issuance of the Certificate of Substantial Completion of the Work, the Engineer in consultation with the Contractor, shall establish a reasonable date for construction completion.

51.4 Immediately following the issuance of the Substantial Completion Certificate, the Engineer will issue a certificate for payment of holdback monies. The holdback monies authorized by this certificate shall become due and payable to the Contractor on the 46th day following the date of Substantial Completion, as certified by the Engineer, providing that

.1 the Contractor has provided to the Engineer a Certified Certificate of Title (or Titles) from the proper Land Titles Office evidencing that as of the 46th day following the date of Substantial Completion, no Affidavit of Lien or Liens have been filed or other matter recorded to make effective any Builders' Lien or claim;

.2 the Contractor has complied with any conditions imposed by the Owner in his acceptance of the recommendation of the Engineer to issue the Substantial Completion Certificate;

.3 the Contractor has filed with the Owner a current Certificate of the Workers' Compensation Board evidencing that all assessments due to the Board by the Contractor have been paid;

.4 the Contractor has submitted to the Owner a sworn Statutory Declaration, that all accounts for labour, contracts, subcontracts, products and materials, construction machinery and equipment and other indebtedness which may have been incurred by the Contractor in the Substantial Completion of the Work and for which the Owner might in any way be held responsible, have been paid in full, except holdback monies properly retained.

51.5 Where, upon the application of the Contractor, the Engineer certifies that the Work of a Subcontractor has been substantially completed to his satisfaction prior to the Substantial Completion of the Contractor's Work, the Owner may pay to the Contractor the holdback monies retained for such Subcontractor on the 46th day following the date on which the

Engineer certifies that the Work of the Subcontractor has been substantially completed and any amounts so paid shall be deducted from the remainder of the Contract price. In making such an application, the Contractor will provide the Engineer with any documentation; which, in the opinion of the Engineer, is necessary to release the Owner from any obligations to the Subcontractor and Contractor, as the case may be.

51.6 The Engineer will, no later than 10 days after the receipt of an application from the Contractor for a Construction Completion Certificate, make an inspection and assessment of the Work to verify the validity of the application. The Engineer will, no later than seven days after his inspection, notify the Contractor of his approval or the reasons for his disapproval of the application. When the Engineer finds that construction completion has been reached, he will issue a Construction Completion Certificate and certify for payment the remaining monies due to the Contractor under the Contract, less holdback monies that are required to be retained. The date of construction completion of the Work shall be stated on the Certificate. Subject to the provisions of Article 31 (Workers' Compensation Insurance), the Owner shall make prompt payment to the Contractor in accordance with the provisions of Article 2 of the Agreement Form.

51.7 The release of the remaining holdback monies shall become due and payable on the 46th day following the date on which the Engineer has certified that the Work has been totally completed, providing that

.1 the Contractor has provided to the Engineer a Certified Certificate of Title from the proper Land Titles Office evidencing that as of the 46th day following the date of Construction Completion, no Notice of Affidavit of Lien or Liens have been filed or other matters recorded to make effective any Builders' Lien or claim;

.2 the Contractor has complied with any conditions imposed by the Owner in his acceptance of the recommendation of the Engineer to issue said total Completion Certificate;

.3 the Contractor has filed with the Owner a current Certificate of the Workers' Compensation Board evidencing that all assessments due to the Board by the Contractor have been paid;

.4 the Contractor has submitted to the Owner a sworn Statutory Declaration, indicating that all accounts for labour, contracts, subcontracts, products and materials, construction machinery and equipment, and other indebtedness which may have been incurred by the Contractor in completion of construction and for which the Owner might in any way be held responsible, have been paid in full; except holdback monies properly retained;

.5 the Contractor and all Subcontractors have obtained and paid for all permits and licenses required either by the Province, the Municipality, or any other Authority having

jurisdiction over the work performed.

51.8 No payment made by the Owner under this Contract, or partial or entire use or occupancy of the Work by the Owner, shall constitute an acceptance of Work or products, which are not in accordance with the requirements of the Contract Documents.

51.9 All certificates issued by the Engineer shall be correct and complete to the best of his knowledge, information, and belief. By issuing any certificate, the Engineer does not guarantee correctness or completeness of the Work.

51.10 The acceptance by the Contractor of final payment after issuance of the Construction Completion Certificate shall constitute a waiver and release by the Contractor of all claims against the Owner; except any claims previously made and remaining unsettled at that time.

51.11 The maintenance period will commence on the date of Substantial Completion of the Work.

Article 52 - Payment Withheld

52.1 Upon receipt of a Certificate in writing from the Engineer stating that, in his opinion, justification exists, the Owner may withhold or nullify, on written notice to the Contractor specifying the ground or grounds relied on, the whole or any part of any payment to the extent necessary to protect himself from loss on account of one or more of the following:

.1 That the Contractor is not making satisfactory progress in the opinion of the Engineer;

.2 That defective work is not being remedied in a manner satisfactory to the Engineer;

.3 That there are Affidavits of Lien or Liens filed against the land and premises on which the Work is done or is being done, or reasonable evidence of the probable filing of such Affidavits of Lien or Liens;

.4 That the Contractor is failing to make prompt payments as they become due to Subcontractors or for material or labour;

.5 That there exists unsatisfied claims for damages caused by the Contractor to anyone employed on the site or in connection with the Work.

52.2 Where Subcontractors or suppliers of material are not receiving prompt payment, the Owner may make payment to such Subcontractors or suppliers directly and deduct the amount of such payments from amounts otherwise due to the Contractor, if the Contractor fails to do so upon five days notice from the Owner.

Article 53 - Liens

53.1 The Contractor shall remove or cause to be removed all Affidavits of lien or liens filed or registered against the lands and premises on which the Work is being performed or has been performed which claim of Lien or Liens arise out of anything done or to be done under this

Contract. Such removal shall be affected by the Contractor forthwith upon demand by the Owner or the Engineer.

53.2 Article 53.1. does not apply to Liens filed by the Contractor.

53.3 Notwithstanding any other provisions herein, the Contractor shall indemnify and hold harmless the Owner from all demands, damages, costs, losses, and actions arising in any way out of a lien or liens which arise out of anything done or to be done under the Contract; and if the contractor fails to remove all liens promptly, the Owner shall be at liberty to remove same in any manner he chooses at the expense of the Contractor.

Article 54 - Deductions for Incomplete Work and Deficiencies

54.1 For the purpose of this Contract, where the Work or a substantial part thereof is ready for use or is being used for the purpose intended, and where the Work cannot be completed expeditiously or defects or deficiencies cannot be corrected promptly because of climatic or other similar conditions reasonably beyond the control of the Contractor, the value of the Work to be completed or materials to be furnished, as calculated by the Engineer, shall be deducted from the contract price in determining Substantial Completion.

In this situation, the Contractor may, in writing, request from the Engineer a Substantial Completion Certificate. Such request shall be accompanied by a written statement that all claims and demands of the Contractor for extra work or otherwise in connection with the work to be accepted, have been presented in writing.

If the Engineer considers such request to be reasonable, he will carry out an inspection and will notify the Contractor, in writing, of any defects or deficiencies, which require correction before he will recommend Seasonal or Substantial Completion. The Engineer will prepare an additional list of defects and deficiencies which, in his opinion, do not impair the usefulness to the Owner of the whole Work and the correction of which may reasonably be deferred. The list shall state the amount, which the Engineer considers to be the cost of completing such Work and correcting such defects and deficiencies. When all of the Work has been performed and defects and deficiencies corrected, other than those on this list, the Engineer will recommend to the Owner that a Seasonal or Substantial Completion Certificate be issued to the Contractor. If the Owner accepts this recommendation, a Seasonal or Substantial Completion Certificate will be issued to the Contractor stating the Work to be performed, the defects and deficiencies to be corrected, and the estimated cost thereof. The Seasonal or Substantial Completion Certificate shall fix the date within which all such Work shall be performed and within which the defects and deficiencies shall be corrected.

54.2 The Owner, when evaluating an application for Seasonal or Substantial Completion, shall take into consideration the effect of applicable Builders' Lien legislation and the Owner may make his acceptance conditional on the Contractor providing written consents of sureties under any maintenance, Performance or Labour and Materials Payment Bonds, or any other

documentation deemed necessary to ensure that no Surety or Guarantor shall be relieved of his obligations.

54.3 If the Contractor does not complete the Work or correct the defects and deficiencies listed on the Seasonal or Substantial Completion Certificate within the time specified therein, the Owner may have the Work performed and the defects and deficiencies corrected by any means he deems appropriate; the costs of which shall be borne by the Contractor.

54.4 If the Owner issues a Seasonal or Substantial Completion Certificate, the Engineer shall prepare a list of incomplete work and deficiencies indicating the total value of any incomplete Work pursuant to the Contract, together with an estimate of the cost to complete and correct any defects or deficiencies, including the costs of any additional expenses for engineering, surveying, testing, or administration caused by failure of the Contractor, if any, to complete the Work on schedule.

54.5 In preparing a certificate of payment to the Contractor pursuant to the Seasonal or Substantial Completion Certificate, the Owner may deduct a sum equivalent up to two times the amount shown on the Substantial Completion Certificate to be the estimated cost of performing the incomplete Work and correcting the defects and deficiencies, together with the necessary amount to be retained pursuant to the applicable Builders' Lien legislation; and the Contractor shall not be entitled to claim for any damages or lost profits suffered by reason of such deduction. If the amount to be withheld in respect of Work completed, or defects or deficiencies still to be corrected, exceeds the amount otherwise payable to the Contractor, the excess shall be withheld from the amount of the Builders' Lien holdback which the Contractor is entitled to.

54.6 Notwithstanding anything stated under clauses 54.1 through 54.5, the Owner may, at its sole discretion and for multi-stage projects as identified by the Owner, choose to progressively release holdbacks for any identified schedule of the project. The releases shall not override anything stated above and shall have no effect to the bonding validity or to the maintenance period. Both, bonding terms and the maintenance period are still to be triggered by Substantial Completion of the Work.

Article 55 - Cutting, Patching, and Digging

55.1 The Contractor shall do all cutting, fitting, or patching of the Work that may be required to make its parts come together properly, and to connect properly with the Work of Other Contractors shown in, or reasonably applied by, the Contract Documents, and the Contractor shall make good after them, as the Engineer may direct.

55.2 The Contractor shall not endanger any existing work by cutting, digging, or otherwise; and shall not cut or alter the Work of any Other Contractor, except with the consent of the Engineer and then only to the extent permitted by the Engineer.

Article 56 - Clean Up

56.1 The Contractor shall maintain the Work in a safe and tidy condition and free from any accumulation of waste products and debris.

56.2 Upon obtaining Substantial Completion of the Work, the Contractor shall remove his surplus products, tools, construction machinery, and equipment not required for the performance of the remaining Work. He shall also remove waste products and debris, and leave the Work clean and suitable for occupancy unless otherwise specified.

56.3 Construction Completion shall not be obtained until the Contractor has removed his surplus products, tools, construction machinery and equipment, waste products, and debris. If the Contractor fails to comply with the provisions of this Article, the Owner may remove any surplus products, tools, construction machinery and equipment, waste products and debris left on the Work site by the Contractor; and any incidental costs incurred, including storage costs, shall be expensed to the Contractor or deducted from any further monies owing to the Contractor pursuant to the Contract.

Article 57 - Payment for General Requirements

57.1.1 All Work described in the General Requirements of the Contract Specifications is considered incidental to Work described elsewhere, and there shall be no separate payment for work required by the General Requirements, unless otherwise specified.

Article 58 - FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

58.1 Any information collected or generated by the Contractor in the course of the performance of the Contract, is the sole property of The Town of Drayton Valley and it is subject to the Freedom of Information and Protection of Privacy Act, as well as all other regulation requirements governing the management of personal information.

ARTICLE 59 – AGENCY

59.1 The Contractor, while performing any services under this Agreement, is an independent Contractor and is not an agent of the Owner.

ARTICLE 60 – PRIME CONTRACTOR

60.1 The Contractor will be assigned the responsibilities and duties of the "**Prime Contractor**" as defined in the Occupational Health and Safety Act. The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance with the Act and Regulations by all his employees, subcontractors and others on the site.

60.2 The Contractor shall provide to the Engineer a copy of the Contractor's Safety Management Program and Safety Policy. A copy of such manual shall be available for review by the Contractor's employees and subcontractors at all times.

60.3 The Contractor shall conduct regular safety meetings and shall submit minutes of such meetings to the Engineer in a timely manner.

ARTICLE 61 – SUSPENSION OF WORK

61.1 The Owner may at any time and at its sole discretion suspend the Work for a specified or unspecified time by a written notice to the Contractor.

61.2 Upon receiving notice of suspension the Contractor shall immediately suspend all operations except those which in the Owner's opinion are necessary to preserve, care for and protect the job site.

61.3 The Contractor shall only be entitled to be reimbursed for its reasonable, proper and actual expenses incurred in protecting, caring for and preserving the job site.

END OF DOCUMENT

SECTION 00600 – LABOUR AND MATERIAL PAYMENT BOND

SAMPLE LABOUR AND MATERIALS PAYMENT BOND

Policy No. _____ $
_____

Note: This Bond is issued simultaneously with another Bond in favour of the Obligee conditioned for the full and faithful performance of this Contract.

_____as Principal, hereinafter called "the Principal", and _____

a corporation created and existing under the laws of the Province of Alberta and duly authorized to transact the business of Suretyship in the Province of Alberta as Surety, hereinafter called "the Surety" are, subject to the conditions hereinafter contained, held and firmly bound unto The Town of Drayton Valley, as Trustee, hereinafter called "the Obligee", for the use and benefit of the Claimants, their and each of their heirs, executors, administrators, successors and assigns, in the amount of _____ Dollars ($_____) of lawful money of Canada for the payment of which sum well and truly to be made the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written contract with the Obligee, dated the _____day of _____ A.D. _____, for _____

_____
_____
_____

which Contract Documents are by reference made a part hereof, and are hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall make payment to all Claimants for all labour and material used or reasonably required for use in the performance of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A Claimant for the purpose of this Bond is defined as one having a direct Contract with the Principal for labour, material, or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment directly applicable to the

Contract; provided that a person, firm, or corporation who rents equipment to the Principal to be used in the performance of the Contract under a Contract which provides that all or any part of the rent is to be applied towards the purchase price thereof, shall only be a Claimant to the extent of the prevailing industrial rental value of such equipment for the period during which the equipment was used in the performance of the Contract. The prevailing industrial rental value of equipment shall be determined, insofar as it is practical to do so, in accordance with and in the manner provided for in the latest revised edition of the publication of the Canadian Construction Association titled "Rental Rates on Construction Equipment", published prior to the period during which the equipment was used in the performance of the Contract.

2. The Principal and the Surety hereby jointly and severally agree with the Obligee, as Trustee, that every Claimant who has not been paid as provided for under the terms of his Contract with the Principal, before the expiration of a period of 90 days after the date on which the last of such Claimant's work or labour was done or performed or material were furnished by such Claimant, may as a beneficiary of the trust herein provided for, sue on this Bond, prosecute the suit to final judgement for such sum or sums as may be justly due to such Claimant under the terms of his Contract with the Principal and have execution thereon. Provided that the Obligee is not obliged to do or take any act, action or proceeding against the Surety on behalf of the Claimants, or any of them, to enforce the provisions of this Bond. If any act, action, or proceeding is taken either in the name of the Obligee or by joining the Obligee as a party to such proceeding, then such act, action, or proceeding, shall be taken on the understanding and basis that the Claimants, or any of them, who take such act, action, or proceeding shall indemnify and save harmless the Obligee against all costs, charges and expenses, or liabilities incurred thereon and any loss or damage resulting to the Obligee by reason thereof. Provided still further that, subject to the foregoing terms and conditions, the Claimants, or any of them, may use the name of the Obligee to sue on and enforce the provisions of this Bond.

3. No suit or action shall be commenced hereunder by any Claimant

    1. Unless such Claimant shall have given written notice within the time limits hereinafter set forth to each of the Principal, the Surety, and the Obligee, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal, the Surety, and the Obligee at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given

        1. In respect of any claim for the amount or any portion thereof, required to be held back from the Claimant by the Principal, under either the terms of the Claimant's Contract with the Principal or under the Mechanics' Liens Legislation applicable to the Claimant's Contract with the Principal, whichever is the greater, within 120 days after such Claimant should have been paid in full under the Claimant's Contract with the Principal;

2. In respect of any claim other than for the holdback, or portion thereof, referred to above, within 120 days after the date upon which such Claimant did, or performed the last of the work or labour or furnished the last of the materials for which such claim is made under the Claimant's contract with the Principal.

2. After the expiration of one year following the date on which the Principal ceased work on the Contract, including work performed under the guarantees provided in the Contract;

3. Other than in a Court of competent jurisdiction in the Province of Alberta, Canada, and the parties hereto agree to submit to the jurisdiction of such Court.

4. Any material change in the Contract between the principal and the Obligee shall not prejudice the rights or interest of any Claimant under this Bond, who is not instrumental in bringing about or has not caused such change.

5. The amount of this Bond shall be reduced by, and to the extent of any payment or payments made in good faith, and in accordance with the provisions hereof, inclusive of the payment by the Surety of Mechanics' Liens which may be filed of record against the subject matter of the Contract, whether or not claim for the amount of such Lien be presented under and against this Bond.

6. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

IN WITNESS WHEREOF, the Principal and the Surety have signed and Sealed this Bond this_____day

of _____ A.D. _____.

SIGNED and SEALED

In the presence of (

(

(_____(Seal)
Principal

(

(_____(Seal)
Surety

SECTION 00700 – PERFORMANCE BOND

SAMPLE PERFORMANCE BOND

Policy No. _____ $
_____

_____
as principal, hereinafter _____called "the Principal", and
_____ a corporation created and existing under the laws of The Province of Alberta and duly authorized to transact the business of Suretyship in the Province of Alberta as Surety, hereinafter called "the Surety", are held and firmly bound unto **The Town of Drayton Valley**, as Obligee, hereinafter called "the Obligee", in the amount of _____ Dollars ($ _____) lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written contract with the Obligee, dated the ___ day of _____ _____ A.D.
_____ for _____
_____
_____

in accordance with the Contract Documents submitted, therefore, which are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever the Principal shall be, and declared by the Obligee to be, in default under the Contract, the Obligee having performed the Obligee's obligations thereunder, the Surety may promptly remedy the default, or shall promptly

1. complete the Contract in accordance with its terms and conditions; or

2. obtain a bid or bids for submission to the Obligee for completing the Contract in accordance with its terms and conditions, and upon determination by the Obligee and the Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the Obligee and make available as work progresses (even though there should be a default, or a succession of defaults, under the Contract or Contracts of completion, arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract price", as used

in this paragraph, shall mean the total amount payable by the Obligee to the Principal under the Contract, less the amount properly paid by the Obligee to the Principal.

Any suit under this Bond must be instituted before the expiration of two years from the date on which final payment under the Contract falls due.

The Surety shall not be liable for a greater sum that the specified penalty of this Bond.

No right of action shall accrue on this Bond, to or for the use of, any person or corporation other than the Obligee named herein, or the heirs, executors, administrators, or successors of the Obligee.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond this_____day of _____ A.D. _____.

SIGNED and SEALED

In the presence of (

(

(

(_____(Seal)

Principal

(

(

(

(_____(Seal)

Surety

SECTION 00800 – SPECIAL PROVISIONS

1. Disposal of Excess Stripping Material

1. Excess soil materials include topsoil not required to reclaim the right-of-way, or subsoil or spoil materials not required for right-of-way construction must be disposed of by the Contractor.
2. Excess soil materials may only be placed on public land with written approval from the Town of Drayton Valley.
3. Excess soil materials may only be placed on private land with prior written approval from the landowner.

2. Borrow Excavation

1. The Town of Drayton Valley will supply the source for the borrow material. Borrow material is located at the Clean Energy Technology Centre located at 5400 24 Avenue accessible from 50 Street.

3. Existing Rock Rip Rap

2. There is approximately 100 m^2 of existing rock rip rap on the site. The Contractor shall salvage, stockpile and reuse existing rock rip rap as directed by Consultant.

4. Grout and Abandon Existing Corrugated Steel Culvert

1. The Contractor shall completely fill the existing culvert at STA 5+055 with a permanent cementitious fill material with a minimum compressive strength of 0.5 MPa to prevent future collapse of the culvert.
2. The filling of the culvert shall be carried out using methods and materials approved by the Engineer.
3. The Contractor shall take precautions during filling operations to ensure that no blow outs or disruptions of the existing roadway occur.
4. Work shall also include the removal and disposal of the T section of culvert.
5. The CSP culvert at STA 5+066 shall be in operation before grouting of the abandoned culvert begins.

5. 1800 mm Precast Catchbasin Manhole – Install Only

1. Contractor shall install a custom catchbasin manhole to be supplied by the Town as shown on drawings.

6. Catchbasin Manhole Slab – Install Only

1. Contractor shall install a custom catchbasin manhole slab to be supplied by the Town as shown on drawings.

7. NF-31 Frame and Grate

1. Contractor shall supply and install two (2) NF-31 Frames and Grates as shown on drawings.
2. Trash grates similar to those shown on the drawings shall be supplied by the Contractor. Shop drawings for the grates shall be supplied to and approved by the Engineer prior to fabrication or supply.

8. CSP Culvert Installation

1. Contractor shall supply and install a 27 m long by 900 mm diameter CSP (STA 5+066) and an 15.6 m long by 500 mm diameter CSP (STA 5+022) as shown on drawings. Wall thickness of each CSP should be 2.8 mm with 2:1 sloped ends.

9. Roadwork for CSP Culvert Installation

1. For roadwork associated with the installation of the CSP culverts, the Contractor shall remove, stockpile and reinstall road fill material to the gradeline shown on the drawings.
2. Contractor shall supply and place surface gravel and shall be a minimum compacted layer of 100mm depth of crushed gravel. The bottom 50mm shall consist of 4:30 (one and one quarter inch (1 ¼")) gravel, in accordance with Alberta Transportation Specification for Aggregates, compacted into the subgrade. The top 50mm shall be 4:20 (three quarter inch (3 /4")) gravel.

10. Guardrail

1. The Contractor shall carefully remove, stockpile and re-install the existing guardrail between Stations 5+050 to 5+075.

11. Rock Check Dams

1. The Contractor shall install rock check dams as shown on the drawings and in conjunction with Alberta Transportations Erosion and Sediment Control B.M.P. #7 Rock Check Dam.
2. Construction
    1. Excavate a trench key a minimum of 0.15 m in depth at the rock check structure location
    2. Construct structure by machine or hand
    3. Structure should extend from one side of the ditch or channel to the other
    4. Structure should be constructed so that centre of the crest is depressed to form a centre flow width which is a minimum of 0.30 m lower than the outer edges
    5. Height of structures should be less than 0.8 m in height to avoid impounding large volumes of runoff
    6. Downstream slope of the check dam should be 5H:1V (minimum)

7. Upstream slope of the check dam should be 4H:1V (minimum)

12. Rolled Erosion Control Products

1. Erosion Control Blanket - The Contractor shall install S75 single net straw matting or approved equivalent as shown on the drawings and in conjunction with Alberta Transportations Erosion and Sediment Control B.M.P. #13 Rolled Erosion Control Products.
2. Construction
    1. Slopes should be topsoiled and seeded prior to placing RECP.
    2. Ensure blanket is in intimate contact with the soil by properly grading soil, removing rocks or deleterious materials, prior to placing blanket.
    3. In channels, blankets should extend to above the anticipated flow height, with a minimum 0.5 m of free board.
    4. Blanket should be anchored by using wire staples, metal geotextile stake pins, or triangular wooden stakes – All anchors should be a minimum of 0.15 to 0.2 m in length – For loose soils, use longer anchors.
    5. Blankets should be placed longitudinal to direction of flow, with fabric not stretched but maintaining contact with underlying soil.

13. Silt Fence

1. The Contractor shall supply and install silt fence as shown on the drawings and in conjunction with Alberta Transportations Erosion and Sediment Control B.M.P. #1 Silt Fence.
2. Construction
    1. Drive support posts a minimum of 0.3 m (preferably 0.6 m) into ground, spaced a maximum of 2 m apart.
    2. Excavate trench approximately 0.15 m deep by 0.15 m wide for entire length of fence along upstream side of posts.
    3. Extend filter fabric to base of trench and attach on upstream side of posts.
    4. Backfill and compact soil in trench, being careful not to damage fence.

14. Traffic Accommodation Strategy

1. Traffic Accommodation shall account for the road closure during the open cut installation of CSP culverts as well as work performed on road shoulders.
2. Traffic Accommodation shall be carried out in accordance with Specification 7.1, Traffic Accommodation and Temporary Signing, of the Alberta Transportation Standard Specifications for Highway Construction; and as directed by the Consultant.
3. The Owner reserves the right to modify the Contractor's operations if in the opinion of the Consultant, traffic is being unduly hindered.

4. Traffic shall be maintained on the existing roadway throughout the duration of this Contract unless authorized by the Consultant. The Contractor may need to provide suitable provisions to safely accommodate the travelling public around the work area for a portion of the project through the utilization of local roads as an off-site detour.
5. Prior to any prolonged shut down of construction, the Contractor shall ensure that any disturbed roadway surface is restored to a condition suitable for traffic operations as directed by the Consultant.
6. The contractor shall develop a communication strategy to be implemented prior to commencing construction. The communication strategy shall be submitted with the Traffic Accommodation Strategy and shall address liaising with the Town of Drayton Valley and notification of emergency services including the RCMP and ambulance services.
7. Preparation of the Traffic Accommodation Strategy will be considered incidental to the work and no additional payment will be made.

15. Environmental Construction Operations (ECO) Plan

1. One week prior to commencing construction, the Contractor must submit a site specific ECO Plan in accordance with the Alberta Transportation ECO Plan Framework. The ECO Plan shall identify and show mitigation strategies of environmental impacts that may occur as a result of their activities. The ECO Plan will be reviewed by the Consultant representatives prior to commencing construction. The Contractor will ensure effective implementation of his ECO Plan.
2. The ECO plan must address all requirements included in the framework including provisions for care of water during construction.
3. Preparation of the ECO plan will be considered incidental to the work and no additional payment will be made.

DETAILED SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01000 – GENERAL INSTRUCTIONS
SECTION 01015 – CONTRACTOR'S USE OF THE SITE
SECTION 01020 – QUALITY CONTROL
SECTION 01025 – MEASUREMENT AND PAYMENT
SECTION 01040 – CO-ORDINATION
SECTION 01050 – CONSTRUCTION SURVEYING
SECTION 01060 – REGULATORY REQUIREMENTS
SECTION 01070 – ABBREVIATIONS
SECTION 01200 – PROJECT MEETINGS
SECTION 01300 – SUBMITTALS
SECTION 01340 – SHOP DRAWINGS
SECTION 01500 – CONSTRUCTION FACILITIES
SECTION 01545 – PROJECT SAFETY REQUIREMENTS
SECTION 01560 – ENVIRONMENTAL CONTROLS
SECTION 01601 – MATERIAL AND EQUIPMENT
SECTION 01700 – CONTRACT CLOSEOUT

SECTION 01000 – GENERAL INSTRUCTIONS

PART 1.0 – GENERAL

1. Description

1. The work, unless specifically stated otherwise, shall include the furnishing of all materials, products, plants, labour, equipment and transportation necessary to complete the work. The intent is that the Contractor provides a complete job.
2. The work shall not be deemed complete until all components are placed in operation by the Contractor, and are operating satisfactorily.
3. Any minor item of the work not called for in the specifications or shown on the drawings but clearly required to meet the intent of design and normally provided for the proper operation of the work shall be provided as if specifically called for in the contract documents.
4. The complete work under this contract shall be governed by the dictates of good practice in all details, materials and workmanship even if not minutely specified. The components of the work shall be properly coordinated to provide a complete system.

2. Existing Surface Conditions

1. The Contractor shall examine the site of the proposed work, prior to submitting a tender, and ascertain that the location, size and depth of surface structures, including roadway and concrete structures, landscaping and utilities, as shown on the drawings and described in these documents, represent actual conditions.

2. The Contractor shall report immediately any discrepancies between the details shown on the drawings and the actual field conditions or any omissions to the drawings and/or other documents to the Consultant.

3. Site Inspection During Tendering

1. Inspection
    1. The Contractor shall inspect the site and note all existing site conditions.
    2. Make note of the arrangement needed for access during construction, traffic control, maintenance of supplies and interference with existing utilities.
    3. Carry out subsurface investigation if deemed necessary by the Contractor and acceptable to the Owner.
2. Drawings and Documents
    1. Obtain clarification from the Consultant when the meaning of the drawings and the documents is in doubt, prior to submitting the tender.

2. After submission of the tender, no claim will be considered on the grounds that there was any misunderstanding with respect to the conditions imposed by the contract documents.
3. Verbal conversation or agreement made at any time with the officer, agency or employee of the Owner or the Consultant shall not affect or modify any of the terms or obligations under the contract.

4. Documents Required

1. Maintain on the job site at least one (1) copy of each of the following to be available at all times to the Consultant and his representatives:
    - Contract Drawings
    - Specifications
    - Addenda
    - Change Orders
    - Reviewed Shop Drawings
    - Modifications to the Contract
    - Field Test Reports
    - Construction Schedule
    - Manufacturer's Installation and Application Instructions
    - Occupational Health and Safety Regulations

5. Direction of the Work

1. The Consultant will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or for the supervision of the Contractor's performance of this contract, or for the Contractor's failure to perform the work in accordance with the contract. However, if at any time the Consultant is of the opinion that the number of workmen, pieces of equipment, quality of machinery, tools, plant and equipment or articles are insufficient to meet the schedule, he may so advise the Contractor. The Contractor shall promptly make the necessary changes to ensure that the schedule is adhered to.
2. Pursuant to the provisions of the General Conditions of the contract, while it is intended that the Contractor shall be allowed in general to carry out the contract in such a manner that may appear to him to be the most desirable, the Consultant at his discretion may direct the order in which and points at which the work shall be undertaken. This control shall be exercised in the interest of the Owner and it is intended that an agreement be reached between all parties prior to the commencement of the contract.

6. Standard Specifications

1. Wherever standard specifications (ie. CSA, ASTM and such) are referred to in these contract documents the current edition at the date of closing of tenders shall apply.
2. Where there is a clear conflict between the Standard Specifications and the contract documents, the contract documents shall apply.
3. Where there is an ambiguity between the Standard Specifications and any term of these contract documents, the Consultant shall, in the first instance, give an interpretation of the intent of the contract.

7. Security

1. The Owner will not be responsible for any loss or damage to the property of the Contractor. The Contractor shall furnish any additional watchmen as he deems necessary.

8. Parking

1. The Contractor and his employees shall not park their vehicles and equipment in areas designated for local residents.

SECTION 01015 – CONTRACTOR'S USE OF THE SITE

PART 1.0 – GENERAL

1. The Construction Site

1. The Owner will provide the land upon which the work is to be constructed.

2. Contractor's Use of the Site

1. Use of the site is restricted to those areas shown on the plans or approved by the Consultant.
2. The Contractor shall have use of the site, provided that the Contractor shall permit access to the Owner, the Consultant and other Contractors on the site for purposes of inspections, reviews, tests and carrying out work related to the work.
3. Contractor's use of the site for storage and for executing the work is subject to the approval of the Owner.
4. The Contractor shall not unreasonably encumber the site with material or equipment.
5. The Contractor shall obtain and pay for the use of additional storage or work areas needed for operations.
6. The Contractor shall maintain/provide access to all residential and commercial property adjacent to the work at all times, and shall confine activities relevant to the work to areas within the designated working area. No fires are permitted on the site.
7. The Contractor shall conduct construction operations with minimum interference to adjacent roadways, sidewalks and access facilities in general, and shall keep such areas free from materials, debris and equipment at all times.

END OF SECTION

SECTION 01020 – QUALITY CONTROL

PART 1.0 – GENERAL

1. Requirements Included

1. Inspection and testing, administrative and enforcement requirements.
2. Tests and mix designs.

2. Related Requirements Specified Elsewhere

1. Particular requirements for inspection and testing to be carried out as designated by the Consultant are specified under various sections.
2. Section 01300 – Submittals
3. Section 01601 – Material and Equipment
4. Alberta Environment Standards

3. Appointment and Payment

1. The Owner shall retain the services of an independent testing agency.
2. The Owner will pay for such services of testing laboratory except for the following:
    1. Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
    2. Inspection and testing performed exclusively for the Contractor's convenience.
    3. Mill testing and certificates of compliance.
    4. Tests specified in the contract document to be carried out by the Contractor under the supervision of the Consultant.
3. There shall be no additional payment for any of the items in this section as noted.

4. Retesting

1. When tests on products, materials or completed work carried out by the Contractor yield results not meeting the requirements of the contract documents, the Contractor, in addition to carrying out remedial work or replacement of the product or materials, shall provide retesting of the remedied work and the replacement product and materials. Retesting shall be at the Contractor's expense.
2. In every case where the Contractor has submitted test results, which fail to meet the requirements of the contract documents, the Contractor shall submit within a practical and reasonable time, results of a retest showing that the results are in accordance with the requirements of the contract documents.

5. Contractor's Responsibilities

1. Furnish labour and facilities to:
    1. Provide access to work to be inspected and tested.
    2. Facilitate inspections and tests.
    3. Make good work disturbed by inspection and test
    4. Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
2. Notify Consultant sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
3. Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
4. Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by the Consultant.

SECTION 01025 – MEASUREMENT AND PAYMENT

PART 1.0 – GENERAL

1. Payments shall be made on the basis of the unit prices bid in the Unit Price Schedules in the Tender Form.
2. The prices bid for various items of work, unless specifically noted otherwise, shall include the supply of all labour, material, plant and equipment required to construct the work in accordance with the drawings and specifications.
3. The method of measurement of the quantities for payment and the basis for payment will be accordance with the following items of this section. All measurement will be done by the Consultant.
4. The prices bid for supply and installation of materials shall be full compensation for supplying, delivering, loading, unloading, handling, storage, breakage, waste, hauling, installing, cleaning, testing and placing in service the work together with all work subsidiary and incidentals thereto for which separate payment is not provided elsewhere. **Payment shall be only for materials actually installed. There shall be no payment for materials delivered to site.**
5. All existing materials on-site whether structures, vegetation, topsoil, gravel, sand or other excavated, or piled materials are the property of the Owner on which the work is located. Only those materials specifically noted in the specifications or on the drawings as belonging to the Contractor shall become the Contractor's property.
6. Where there are excess excavated materials, unsuitable materials or materials of any kind that are not used in the work, such materials are not the property of the Contractor unless authorized in writing by the Consultant or specified to be disposed of by the Contractor.
7. The sum of the payments in the Unit Price Schedules of the Tender Form shall constitute full payment for the complete works as described in these documents. Extra payment will only be made for items adding to the scope of the works, as described in these documents and/or shown on the drawings.

PART 2.0 – NON-PAYMENT ITEMS

1. Supply of all equipment, labour, materials, plant and services required to complete the work for which no specific payment item has been assigned in the Unit Price Schedule of the Tender Form shall be considered incidental to the work.
2. There shall be no separate payment for incidental work. Payment for incidental work shall be considered to be included in the total tendered price of the Unit Price Schedules of the Tender Form.

3. There shall be no separate payment for Traffic Accommodation. Payment for Traffic Accommodation shall be considered to be included in the total tendered price of the Unit Price Schedule of the Tender Form.
4. All work shown on the plans and drawings, or referred to in the General Conditions, the Supplementary General Conditions, or the General Specifications shall be considered as part of the complete work unless specifically deleted.

PART 3.0 – MEASUREMENT AND PAYMENT CLAUSES

1. GENERAL SITE WORK

1. Mobilization and Demobilization

1. No measurement shall be made.
2. Payment shall be made on the lump sum price bid.
3. Payment shall include all costs involved in preparing the site for execution of work and moving out of the site. The work includes:
    1. Temporary signs and markings to delineate the site.
    2. Traffic control and diversion work.
    3. Liaison with the public.
    4. Other initial site works required for the setting of the work.
    5. Site clean-up.
    6. All incidental work and items required to complete the work for which payment is not specified elsewhere.
4. Payment for mobilization will be 60% of the lump sum amount.
5. Payment for demobilization will be 40% of the lump sum amount payable after all works are completed.

2. Stripping and Stockpile

1. Measurement shall be made in square metres (m^2). The quantities shall be the surveyed area measured for the actual work on site.
2. Payment shall be made on the unit price bid per square metre (m^2) of topsoil area stripped.
3. Payment shall include supply of all labour, material and plant to strip the topsoil. The work includes:
    1. Stripping of topsoil and organic materials, loading, hauling and removal of material to disposal or stockpile on site.
    2. The work is fully described in detail specification Section 02113 – Stripping.

3. Common Excavation

1. Measurement shall be made in cubic metres (m^3). The quantity shall be the volume measured from cut and fill surfaces. Surfaces have been generated and

volumes computed using AutoCAD Civil 3D 2013™ on the unit price bid per cubic metre (m^3).

2. Payment shall be made on the unit price bid per cubic metre (m^3).
3. Payment shall include the supply of all labour, material and plant for the excavation. The work includes:
    1. Cutting, trimming and removal of material to disposal, stockpile area or fill areas.
    2. Shaping, watering, drying, aerating, compacting and trimming.
    3. Locating and protecting existing utilities and structures.
    4. All incidental work and items required to complete the work for which payment is not specified elsewhere.

4. Rework of Unconsolidated Material

1. Measurement shall be made in cubic metres (m^3). The quantity shall be the volume measured from cut and fill surfaces. Surfaces have been generated and volumes computed using AutoCAD Civil 3D 2013™ on the unit price bid per cubic metre (m^3).
2. Payment shall include all labour, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
3. When the Consultant directs the Contractor to excavate and dispose of unsuitable material, including stones or rocks, and not place this material in the embankment, the excavation and the subsequent disposal of unsuitable materials will be considered incidental to the Work and no separate or additional payment will be made.

5. Grout and Abandon Existing Corrugated Steel Pipe

1. Measurement shall be made in cubic metres (m^3). The quantity shall be the volume measured from the surveyed length and diameter of the pipe.
2. Payment shall include the supply of all labour, material and plant for the excavation.
3. Payment shall be made on the unit price bid per cubic metre (m^3) of pipe grouted.

6. Catchbasin Manhole (1800mm diameter) – Install Only

1. Payment shall be at the lump sum price bid and shall include the supply of all labour, material and plant to install new manhole. The work includes:
    1. Locating and protecting existing utilities and structures.
    2. Excavation and the removal of excavated material to disposal areas and ground support.
    3. Water control and disposal.
    4. Temporary fencing.
    5. Supplying and installing concrete manhole material as specified.
    6. Excavation, trench or ground support systems, shoring and sheeting.

7. Concrete bedding, grouting joints, benching, cutting, patching, connecting and leakage testing.
8. Backfilling as specified, compacting, moisture conditioning and grading.
9. Cleaning and removal of debris.
10. All incidental work and items required to complete the work for which payment is not specified elsewhere.
11. The work is fully described in detail specification Section 02563-Manholes and Catchbasins.

7. Catchbasin Manhole Slab – Install Only

1. Payment shall be at the lump sum price bid and shall include the supply of all labour and material to install new catchbasin slab. All incidental work and items required to complete the work for which payment is not specified elsewhere.

8. Double NF-31 Frame and Grate

1. Payment shall include the supply of all labour and material to two (2) new NF-31 Frame and Grates. The work includes:
    1. Installing of catchbasin frame and cover as specified.
    2. All incidental work and items required to complete the work for which payment is not specified elsewhere.

9. Horizontal Directional Drill – Supply and Install Storm Sewer Pipe

1. Measurement shall be along the horizontal centerline of the pipe installed, measured between the two portals.
2. Payment shall be made on the unit price bid per metre (m) of pipe installed for the size and type specified.
3. Payment shall include the supply of all labour, materials and machinery to complete the work using the horizontal directional drill method. The work includes:
    1. Directional Drilling
    2. Trenching and excavating of entry/exit pits.
    3. Hydrovacing – Locating and protecting existing utilities and structures.
    4. Pipe fusing.
    5. Backfilling and compaction.
    6. Surface restoration and site cleaning.
    7. The work is fully described in detail specification Section 02560.

10. Supply and Install Rip Rap

1. Measurement shall be made in square metres (m^2)
2. Payment shall be made on the unit price bid per square metre (m^2) of rap rap installed as specified in the drawings.

3. Payment shall include the supply, processing hauling and placement of rock riprap material; and all labour, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
4. The work is fully described in Section 02371.

11. S75® Single Net Straw Matting or Equivalent

1. Measurement shall be made in square metres (m²)
2. Payment shall be made on the unit price bid per square metre (m²) of straw matting installed as specified in the drawings.
3. The work is fully described in Special Provisions Section 00800.

12. Topsoil Placement

1. Measurement shall be made in square metres (m²).
2. Payment shall be made on the unit price bid per square metre (m²).
3. Payment shall include the supply of all labour, material and plant for topsoiling. The work includes:
    1. Hauling of topsoil from stockpile.
    2. Shaping, spreading, trimming and final grading of topsoil to 150mm thick.
    3. The work is described in detail specification Section 2911 – Topsoil Placement and Finish Grading.
    4. All incidental work and items required to complete the work for which payment is not specified elsewhere.

13. Hydroseeding

1. Measurement shall be made in square metres (m²).
2. Payment shall be made on the unit price bid per square metre (m²).
3. Payment shall include the supply of all labour, material and plant for seeding.
    1. The work is described in detail specification Section 2921 – Seeding and Section 2924 - Hydroseeding.
    2. All incidental work and items required to complete the work for which payment is not specified elsewhere.

14. Silt Fence

1. Measurement shall be made in lineal metres (m).
2. Payment shall be made on the unit price bid per lineal metre (m).
3. Payment shall include the supply of all labour and material. The work includes:
    1. The work described in Special Provisions – Silt Fence.
    2. All incidental work and items required to complete the work for which payment is not specified elsewhere. .

SECTION 01040 – CO-ORDINATION

PART 1.0 – GENERAL

1. Although the specifications set forth the work of various trades under separate Divisions, it is not intended that the work of that trade is limited to or includes all work set forth in that particular Division. The Contractor shall delegate the extent of the work to be done by the various trades and shall co-ordinate execution of the work by all trades.
2. Although the specifications are separated into titled Division, neither the Consultant nor the owner will be an arbitrator to establish limits of any agreements between the Contractor and his Subcontractors.

PART 2.0 – CUTTING AND PATCHING

1. The Contractor shall do all cutting, fitting or patching of the work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors shown in, or reasonably implied by, the Contract Documents.
2. Any cost caused by cutting and patching due to ill-timed work shall be borne by the Contractor.
3. The Contractor shall not endanger any existing property or portion of the work by butting, digging or any other method, and shall be responsible for any damages caused by him.
4. Where new work connects with existing work, and where existing work is altered, cut and patch as required.
5. Co-ordinate the work to minimize the amount of cutting and patching required.
6. Do no cutting that may impair the strength of structures. Obtain the Consultant's approval before cutting, boring or sleeving load-bearing members.
7. Make cuts clean and smooth and make patches equivalent to new work.
8. Provide openings, holes and sleeves as required for process mechanical, building mechanical, electrical and all other components of the work. Provided openings in pre-cast work and cast-in-place work.
9. Drill or field cut smaller openings or holes and cast openings larger than 100mm diameter.

END OF SECTION

SECTION 01050 – CONSTRUCTION SURVEYING

PART 1.0 – GENERAL

1. Reference Points and Layout

1. The Consultant will establish base lines, reference points and benchmarks for the location of principal components of the work.
2. The Contractor shall carefully preserve all benchmarks, reference points and stakes, and legal survey pins, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their loss or disturbance.
3. The Contractor shall give 48 hours advance notice to the Consultant before the respective construction starts. The Consultant's check on the Contractor's survey work and grade sheets shall not relieve the Contractor responsibility.
4. Existing base horizontal and vertical control points will be provided by the Consultant.
5. The Contractor shall not proceed with the work until he has received from the Consultant such base horizontal and vertical control points and instructions required for the execution of the work.
6. The Contractor shall, before commencing work at any point, satisfy himself and to the meaning and correctness of all stakes and instructions. No claims shall be considered for any allowance based on alleged inaccuracies, failure to read reference points correctly, or failure to interpret instruction correctly.
7. If the Contractor, in the course of the work, finds any discrepancy between the drawings and the physical conditions of the locality or any errors or omissions in the drawings or in the layout as given by points and instructions, he shall inform the Consultant immediately in writing, and the Consultant shall promptly verify the same and issue appropriate instructions. Any work done after such discovery, before further work is authorized, will be done at the Contractor's risk.
8. The Contractor shall be responsible for the correctness of the elevations and dimensions from the references provided by the Consultant.
9. The layout of the work shall be done in accordance with the approved work schedule prepared by the Contractor, as updated from time to time.

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END OF SECTION

SECTION 01060 – REGULATORY REQUIREMENTS

PART 1.0 – GENERAL

1. Alberta Laws and Regulations

1. The Laws and Regulations of the place where the work is performed shall govern.
2. The standards of the work shall conform to or exceed the minimum standards of the Canadian General Standards Board, the Canadian Standards Association and the National Building Code of Canada.
3. In the event of a dispute or misunderstanding between the Owner and the Contractor in relation to the stipulations and provisions of this contract, or to the manner and performance of the whole or any part of the contract by either of the parties, the matter shall be submitted to arbitration as provided for by the Alberta Arbitration Act.
4. The Contractor shall ensure compliance on his part and on the part of all of his Subcontractors with the Alberta Occupational Health and Safety Act and the regulations thereunder. For purposes of this Contract, the Contractor shall be the principal Contractor within the context of the Occupational Health and Safety Act and the regulations thereunder.
5. The attention of the Contractor is drawn to the requirements of the Alberta Builders' Lien Act (2000) and regulations thereunder.
6. In the case of a Contract which falls under the requirements of the Public Works Act, the Alberta Public Works Act shall apply.
7. With respect to requirements for preserving historic resources, the Alberta Historical Resources Act (2000) and regulations thereunder shall be complied with. Any item of suspected paleontological, historical or archaeological significance shall remain the property of the Owner, shall be preserved and recovered within the requirements of the Historical Resources Act. Notify the Consultant whenever any item of paleontological, historical or archaeological value is discovered and suspend operations on the work immediately until the Consultant issues instructions and authorizes that the work may proceed. The Owner may instruct the Consultant to issue a change order if, in the opinion of the Consultant, the Contractor is unduly delayed or is required to perform extra work by reason of the discovery and preservation of any paleontological, archaeological or historical resource. The Consultant will, in the first instance, make a determination of the validity of a claim for delay and an estimate of the time of delay, and of the validity of the Contractor's claim for additional payment and an estimate of the amount of the additional payment.
8. In carrying out the work, the Contractor shall conform to all other Alberta Laws and Regulations thereunder, as though they had been specifically named**.**

2. Burning

1. Restrictions of federal, provincial and municipal authorities shall be compiled with, and permits shall be obtained by the Contractor.

3. Regulations

1. Codes, Standards and Regulations are specified in other sections of the specifications, and the work shall be done in accordance with those Codes, Standards and Regulations where applicable where specified Codes, Standards and Regulations are not dated, conform to the latest issues of the specified Codes, Standards and Regulations as amended and revised.

4. Permits

1. The Contractor shall obtain and pay for all permits, licenses, certificates and government inspection required for the performance of the work.

5. Holidays

1. The Contractor shall not work on any Sunday or Statutory Holiday without the Consultant's approval.

6. Weight Regulations

1. The Contractor shall comply with all requirements of the Public Service Vehicles Act.

END OF SECTION

SECTION 01070 – ABBREVIATIONS

PART 1.0 – GENERAL

1. Abbreviations – Specifications, Methods, Standards

1. **General**

AASHTO	American Association of State Highways and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CCA	Canadian Construction Association
CEC	Canadian Electrical Code
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
ISO	International Organization for Standardization
SSPC	Steel Structures Painting Council
NBC	National Building Code
NSC	National Standard of Canada
TAC	Transportation Association of Canada

2. **Utilities**

API	American Petroleum Institute
AWWA	American Concrete Institute
CGA	Canadian Gas Association
GCSB	Canadian General Standards Board
CSPI	Canadian Steel Pipe Institute
FM	Factory Mutual
IAO	Insurer's Advisory Organization
ULC	Underwriters Laboratories of Canada

3. **Mechanical**

AGMA	American Gear Manufacturer's Association
ANSI	American National Standards Institute
NFPA	National Fire Protection Association

4. **Electrical**

AIEE	American Institute of Electrical Engineers
CEC	Canadian Electric Code
CEMA	Canadian Electrical Manufacturer's Association
IEE	Institute of Electrical Engineers
IES	Illuminating Engineering Society
LEMA	Lighting Equipment Manufacturer's Association

NEC	National Electric Code
NESC	National Electrical Safety Code

5. **Use of Abbreviation**

The abbreviations refer to Specifications, Methods and Standards issued by the respective Association, and the abbreviations are used in the specifications.

Alphanumeric designations following the abbreviations denote the specification, method or standard.

2. Abbreviations – Metric

1. **General**

The specifications are metric and metric usage is based upon SI units in accordance with CSA Standard CAN3 Z234.7-76-Canadian Metric Practice Guide. In this specification, SI units are abbreviated in accordance with the metric units and abbreviations below.

2. **Lineal Measure**

Metre	m
Millimetre	mm
Kilometre	km
Micrometre	mirco-m

3. **Area**

Square metre	m^2
Square millimeter	mm^2
Hectare	ha

4. **Volume**

Cubic metre	m^3
Litre	L

5. **Mass and Density**

Kilogram	kg
Gram	g
Tonne	t
Kilogram per metre	kg/m
Gram per metre	g/m

Kilogram per square metre	kg/m²
Gram per square metre	g/m²
Kilogram per cubic metre	kg/m³

6. **Temperature**

Degree Celcius	°C

7. **Force, Pressure, Stress**

Newton	N
Kilonewton	kN
Pascal	Pa
Kilopascal	kPa
Megapascal	MPa

8. **Velocity, Rate of Flow**

Metre per second	m/s
Metre per hour	m/h
Kilometre per hour	km/h
Litre per second	L/s
Cubic metre per second	m³/s

9. **Power, Energy, Heat, Work**

Watt	W
Kilowatt	kW
Kilowatt hour	kWh
Joule	J

10. **Electricity**

Ampere	A
Volt	V

11. **Illumination**

Footcandle	fc
Lumen	lm
Lux	lx

END OF SECTION

SECTION 01200 – PROJECT MEETINGS

PART 1.0 – GENERAL

1. Pre-construction Meeting

1. Pre-construction meetings will be arranged by the Consultant after the Contract is awarded.

2. Progress Meetings

1. The Owner shall provide physical space for progress meetings with location determined by the Owner.
2. Progress meetings will be held on a bi-weekly basis.
3. The Consultant will give to all parties advance notice of meeting dates, times and locations.
4. The Contractor shall have in attendance the Superintendent, the Project Manager and representatives of the Subcontractors if requested by the Consultant.
5. The Consultant will have the Project Manager and/or the Resident Consultant in attendance.
6. The Owner may have a representative in attendance.
7. Minutes will be taken by the Consultant and copies will be distributed to attendees within five (5) working days after each meeting.
8. The Contractor shall keep one complete set of contract documents and drawings at the site at all times. Ensure that the documents and the drawings are the current “issued for construction” set.

END OF SECTION

SECTION 01300 – SUBMITTALS

PART 1.0 – GENERAL

Submittals shall meet the provisions of this Section, to ensure that the specified products are furnished and installed in accordance with design intent. Individual submittals are required as specified in other sections of the specifications. Until submissions are reviewed by the Consultant and approved by the Owner, work involving relevant products may not proceed.

1. Identification of Submittals

1. Completely identify each submittal and resubmittal by showing at least the following information:
    1. Name and address of the submitter, plus name and telephone number of the individual who may be contacted for further information.
    2. Drawing number and specification section number to which the submittal applies.

2. Coordination of Submittals

1. Prior to submittal for Consultant's review, use all means necessary to fully coordinate all material, including the following procedures:
    1. Determine and verify all field dimensions and conditions, materials, catalogue numbers and similar data.
    2. Coordinate as required with all trades and with all public agencies involved.
    3. Secure all necessary approvals from public agencies and other and signify by stamp or other means that they have been secured.
    4. Clearly indicate all deviations from the Contract Documents.

3. Timing of Submittals

1. Make all submittals far enough in advance of scheduled dates of installation to provide all required time for review, for securing necessary approvals, for possible revisions and resubmittal and for placing orders and securing delivery.
2. In scheduling, allow at least three (3) full working days for the Consultant's review following his receipt of the submittal.
3. Costs of delays occasioned by tardiness of submittals will not be borne by the Owner.

4. Approvals

1. Review of all submittals by the Consultant is limited to evaluating if the materials, equipment and methods conform to the intent of the design. The Contractor shall

remain fully responsible for the accuracy of all work and the quality and reliability of all materials and equipment

PART 2.0 – DEFINITION

Submittals means drawings, illustrations, schedules, performance charts, brochures and other descriptive data and samples that are to be provided by the Contractor to illustrate detail portions of work.

1. Construction Schedule

1. Upon award of the Contract and prior to commencement of the work, the Contractor shall submit for approval to the Consultant a construction schedule in the form of a bar chart showing all the principle phases of work, including supply dates for all materials and equipment, and start and completion dates of all Subcontractors.
2. This schedule shall be updated and submitted to the Consultant monthly by the Contractor.
3. If, in the opinion of the Consultant, any Construction Schedule is inadequate as a contract tool, or if it does not show the work being fully completed by the Contract Completion Date, the Consultant may reject it and the Contractor shall provide a Construction Schedule that is acceptable to the Consultant.

2. Shop Drawings

1. All shop drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.
2. Unless otherwise specifically directed by the Consultant, make all shop drawing prints in black line on white background.
3. Submit six (6) copies of all shop drawings.

3. Colours

1. Unless the precise colour and pattern is specifically described in the Contract Documents, whenever a choice of colour or pattern is available in a specified product, submit accurate colour charts and pattern charts to the Consultant for his review and selection.
2. Unless all available colours and patterns have identical costs and identical wearing capabilities, and are identically suited for the installation, completely describe the relative costs and capabilities of each.

4. Record Drawings

1. The Contractor shall maintain a complete and accurate log of control and survey work as it progresses.
2. The Contractor shall keep one complete set of all construction drawings on the site of the work.
3. On the job site set of Contract drawings, the Contractor shall record any changes that are made during the actual construction of the work. The purpose of recording these changes is to provide an As-Constructed record of the work. The Contractor shall be responsible for the adequacy and the reliability of the information recorded on these drawings.
4. At the completion of the construction period, the Contractor shall turn over the set of As-Construction drawings which have been marked up with changes during the course of the work to the Consultant for their preparation of Record Drawings.
5. Holdback of 10% will be applied until the as-built drawings have been provided, reviewed and accepted by the Consultant.
6. The Contractor is to provide to the Consultant the as-built locations and elevations of all valves, hydrants, flushing assemblies, and manholes installed and also include pipe inverts entering or existing all manholes and structures. Any other items not listed and required to complete the work required in the Contract shall be shown on the drawings.

END OF SECTION

SECTION 01340 – SHOP DRAWINGS

PART 1.0 – REQUIREMENTS FOR SHOP DRAWINGS AND PRODUCT DATA

1. The Contractor shall arrange for the preparation of clearly identified shop drawings and shall submit two (2) prints of shop drawings to be retained by the Consultant plus the number of copies required by the Contractor.

   The Contractor shall provide clearly identified Product Data and submit tow (2) prints to be retained by the Consultant plus the number of copies required by the Contractor.

   Product Data shall include, but not be limited to:

   - Product assembly drawings
   - Materials list
   - Principal dimensions
   - Parts and components details
   - Letters of compliance with recognized standards where required
   - Operation data
   - Operation curves
   - Operation manuals where specified
   - Product Name and Model Number
2. Shop drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item, and its method of connection to the work and shall have sufficient space for the Contractor's stamp and the Consultant's stamp.
3. Shop drawings shall be accordance with the International System of Units (SI) metric units.
4. Prior to submission to the Consultant, the Contractor shall review all shop drawings. By this review stamp, the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so, and that he has checked and coordinated each shop drawing with the requirements of the work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, with the date and signature of a responsible person.
5. The Contractor shall submit shop drawings to the Consultant for his review with reasonable promptness and in orderly sequence so as to cause no delay in the work or in the work of other Subcontractors. If either the Contractor or the Consultant so requests they shall jointly prepare a schedule fixing the dates for submission and return of shop drawings. At the time of submission the Contractor shall notify the Consultant in

writing of any deviations in the shop drawings from the requirements of the Contract Documents.

6. The Consultant will review and return shop drawings in accordance with a schedule agreed upon, or otherwise with reasonable promptness. The Consultant's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents. A specific deviation on the shop drawings requested by the Contractor may be approved in writing by the Consultant.
7. The Contractor shall make any changes in shop drawings which the Consultant may require consistent with the Contract Documents and resubmit unless otherwise directed by the Consultant. When resubmitting, the Contractor shall notify the Consultant in writing of any revisions made by the Contractor other than those requested by the Consultant, in his previous review.
8. Each reviewed shop drawing will be stamped by the Consultant with the following form of stamp:

SENON ENGINEERING INC.

THE REVIEW OF THIS DRAWING DOES NOT IN ANY WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ACCURACY, OMISSIONS OR FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS.

☐ No Comment

☐ Amend Proceed & Resubmit Job No. _____

☐ Amend & Resubmit Reviewed by _____

☐ Rejected. See Remarks Date _____

PART 2.0 – DESIGN BY THE CONTRACTOR

1. When the Contractor is responsible for engineering of design of portions of the work, this shall be clearly and specifically indicated in the drawings or in the specifications of the Contract Documents.
2. Where the Contractor is required, either by law or regulation or by the Contract to provide engineering design, he shall use the services of a Professional Engineer registered in the area in which the work is to be performed, and he shall submit shop drawings bearing the seal and signature of that Registered Professional Engineer.

END OF SECTION

SECTION 01500 – CONSTRUCTION FACILITIES

PART 1.0 – GENERAL

1. Gas

1. The Contractor shall provide and pay for all costs for gas required for the performance of the work, in accordance with governing regulations and ordinances.
2. Furnish and install all necessary temporary piping and upon completion of the work remove all such temporary piping.

2. Water

1. The Contractor shall provide and pay for all costs for water required for the performance of the work, in accordance with governing regulations and ordinances.
2. Furnish and install a backflow preventer and all necessary temporary piing and upon completion of the work remove all such temporary piping.

3. Electricity and Lighting

1. The Contractor shall provide and pay for all costs for electricity and artificial lighting required for the performance of the work, in accordance with governing regulations and ordinances.
2. Furnish and install all necessary temporary wiring, distribution boxes, panels, etc. and upon completion of the work, remove all such temporary materials.

4. Telephone

1. The Contractor shall provide, maintain and pay for all costs for a telephone for the Contractor's use.

5. Heating and Ventilating

1. The Contractor shall provide and pay all costs for heating and ventilating, coverings and enclosures as necessary to protect and perform the work.
2. Furnish and install all necessary temporary equipment, piping, wiring, ducting, and other materials to perform the work and upon completion of the work, remove all such temporary equipment.
3. Temporary heating and ventilating shall be in accordance with all governing regulations and ordinances.
4. Temporary heating and ventilating shall be provided to:

1. Facilitate progress of the work.
2. Protect the work and products against dampness and cold.
3. Prevent moisture condensation on surfaces.
4. Provide an atmosphere for curing materials as required.
5. Provide adequate ventilation to meet safety regulations.
6. Prevent hazardous accumulation of dust, fumes, mists, vapours or gases in areas occupied during construction.
7. Ventilate storage spaces containing hazardous or volatile materials.

6. Sanitary Facilities

1. The Contractor shall furnish and install all required temporary toilet buildings with sanitary toilets for use of all workmen that comply with all minimum requirements of the Health Department or other public agency having jurisdiction. These facilities will be maintained in a sanitary condition at all times.

7. Fire Protection

1. The Contractor shall provide and pay all costs for adequate fire protection of the work an adjacent property.
2. Furnish and install temporary extinguishers, hydrants and other equipment, and upon completion of the work remove all such temporary equipment.

8. Falsework and Temporary Construction Supports

1. The Contractor shall be responsible for methods used for the falsework and temporary construction supports.
2. On major structures employ a qualified, Professional Engineer, Registered in Alberta, for the design of temporary works and design in accordance with CSA-S269.2-1975.
3. Record design calculations and drawings to show that temporary works are adequate. Provide design loads, material details and dimensions. Sign and seal design calculations and drawings and revisions thereto.
4. The Consultant's approval to proceed with falsework and temporary construction supports shall not relieve the Contractor of his responsibility.

9. Dewatering

1. The Contractor shall provide all equipment, labour and materials to keep excavations and site free from water to permit construction of the project, and to protect existing surface and subsurface facilities. This would include the supply and installation of a well

point dewatering system if required. Refer to Section 02315 – Trenching, Backfilling and Compaction.

10. Site Cleanliness

1. The Contractor shall maintain the work site in a tidy condition, free from the accumulation of waste products and debris.
2. Remove waste material and debris from the site and deposit in waste containers at the end of each working day.
3. Make arrangements with, and obtain permits from authorities having jurisdiction for disposal of waste and debris.

11. Winter Construction

1. Special construction methods required to perform the work in severe weather shall be the responsibility of the Contractor.
2. Where the specifications call for work to be performed within a given temperature range or above a minimum temperature, it shall be the Contractor's responsibility to provide all temporary enclosures and heat necessary to provide the conditions specified.
3. Where compaction of backfill is specified, the Contractor shall perform the work in a manner such that compaction can be achieved.
4. Where weather conditions are such that compaction of backfill consisting of excavated materials is not possible, the Contractor shall provide unfrozen granular material for backfill, at the Contractor's expense.

12. Access Roads

1. Construct temporary access roads as necessary to perform the work, and maintain temporary access roads until construction is over or until permanent access is established.
2. Locations and drainage facilities for temporary access roads are subject to the approval of the Consultant.
3. No direct payment will be made to the Contractor for construction of temporary access roads and removal and restoration after construction completion.
4. If authorized to use existing roads for access to the project site, the contractor shall maintain such roads for duration of the contract and make good damage resulting from Contractor's use of road, at their own costs.

13. Existing Utilities and Structures

1. Existing utilities and structures include the following: pipes, culverts, ditches or other items which are a part of an existing sewerage, drainage or water system; or which are a part of a gas, electrical, telephone, television, telecommunications or other utility system. Also included are streets, sidewalks, curbs, gutters, swales, poles, fences or any other structures encountered during construction.
2. The Contractor shall be responsible for protection, removal or replacement of existing utilities and structures, or for repair of any damage, which may occur during construction.
3. Existing utilities and structures may be shown on the drawings, or described in the specifications. Such information is shown for design purposes and the existence, location and detail given is information that is obtained during the design period and is not necessarily complete, correct or current.
4. The Contractor shall pay all costs and be responsible for establishing locations and state of use of all existing utilities that may affect the work. The Contractor shall make satisfactory arrangements with the utilities companies involved for the location, protection and inspection of existing utilities.
5. Notice in writing shall be given by the Contractor to the utilities companies a minimum of 48 hours or as required by the utility company before work commences in the vicinity of existing utilities.
6. The Contractor shall pay all the costs involved in protection of utilities, inspection of utilities, and all costs due to delays because of existing utilities and structures.
7. The Contractor shall provide for the uninterrupted flow of all watercourses, sewers and drains encountered during the work.
8. Access shall be maintained to all existing structures such as valves, hydrants, meter chambers and control structures at all times during construction.
9. If interruption of service provided by an existing utility is necessary, the planned shutdown shall be approved by the utility companies. Requests for shutdown shall be made by the Contractor in writing at least 48 hours in advance.
10. The Contractor shall notify all customers or make arrangements with the utility company to notify all customers twenty-four (24) hours in advance of a shut-down.
11. Unless otherwise specified the Contractor shall make arrangements of relocation of existing utilities that the Consultant requests to be relocated; and the actual relocation shall be constructed by the Owner of the utility. The Contractor will be reimbursed the invoiced cost of the relocation. No extra payment is permitted for delays, or standby time.

14. Construction Signage and Safety

1. This project is located within a commercial area. The Contractor shall be responsible for the regulation of traffic during construction and shall perform the work in a manner that will cause the least disruption of traffic.
2. The Contractor shall coordinate the work with the Consultant and the Owner to reduce traffic problems.
3. Provision of flagmen, traffic signs and other traffic controls shall be the Contractor's responsibility and shall be in accordance with the TAC Manual of Uniform Traffic Control Devices and shall be located to the satisfaction of the Consultant.
4. The Contractor shall supply and maintain at no extra cost all barriers, barricades, warning signs, detours, fences, flagmen and all other devices to protect the workers and general public against accidents or injury. All applicable safety standards shall be followed. All excavations or obstructions shall be clearly marked between sunset and sunrise with proper warning flares or lights.

15. Haul Routes

1. Haul routes (roadways, lanes) shall be subject to the approval of the Owner. The Contractor shall be responsible for damage and/or spillage on all roads used for hauling materials and equipment to and from the site. The Contractor shall immediately clean and/or restore the affected areas.
2. Trucks must be loaded in such a manner that no spillage occurs during the haul.

16. Notifications

1. General

   Notify, in writing, every business/resident whose lot is fronting, backing or immediately adjacent to the construction site, at least seven (7) days in advance of construction in the affected areas. Print notice on the Contractor's letterhead and submit to the Consultant for approval prior to delivery. Give approximate dates of construction in affected areas and clearly indicate Contractor's name, address and telephone number, as well as a telephone number that residents can call for 24 hour emergency service. The notice shall also include a contact person for reporting damage to personal property, alternative parking, access, garbage disposal and temporary water systems. A notice that warns parents of the dangers that exist on construction sites should be included in a notice delivered to every household in the vicinity of construction.

2. Disruption of Sanitary Services

In the event that it should become necessary to disrupt sanitary service to any building during construction, the Contractor is required to provide written notice fourty-eight (48) hours prior to the intended disruption.

Any disruption to private residences must be restricted to the Contractor's working hours. Temporary services shall be provided to the residents after the Contractor has completed work for the day if required. The cost shall be included in the overall tender price. No extra payments will be allowed.

3. Disruption of Water Services
If water service interruption is necessary to carry out the work, provide written notice to residents or occupants of the building 48 hours in advance. Identify the duration of the water interruption.

Provide temporary water supply to buildings if existing water service connections are shut down. The cost shall be included in the overall tender price. No extra payment will be allowed.

Notify the Owner 24 in advance for shutting down of water supply to buildings and/or operating (opening/closing) of water valves.

17. Maintenance of Utility Services

1. The Contractor shall be responsible for providing, maintaining and repairing temporary utilities services. The costs for providing temporary utility services shall be included in the overall tender price and no extra payment will be allowed.
2. During construction and warranty periods, if the Contractor fails to respond to requests for remedial works regarding maintaining or repairing temporary utility services, within reasonable time, the Owner shall have the right to carry out the necessary remedial works and shall charge the costs of the remedial works done to the Contractor.

18. Traffic Regulation

1. The Contractor shall be responsible for the regulation of traffic during construction and shall perform the work in a manner that will cause the least disruption of traffic.
2. The Contractor shall coordinate the work with the Consultant and the Owner to reduce traffic problems.
3. Provision of flagmen, traffic signs and other traffic controls shall be the Contractor's responsibility and shall be in accordance with the TAC Manual of Uniform Traffic Control Devices.
4. The Contractor shall supply all barriers, barricades, warning signs, detours, fences, flagmen and all other devices to protect the public. All applicable safety standards shall be followed.

5. The Contractor shall obtain approval to block traffic temporarily if it is necessary to do so to complete the work. Obtain written approval of applicable municipal departments, the Owner and the Consultant. At least two (2) weeks prior to blocking traffic, notify the following bodies:
   - Local Police Department
   - Local Fire Department
   - Public Works Department
   - Utilities Companies
   - Abutting Property Owners
6. The Contractor shall maintain/provide access to all residential and commercial property adjacent to the work at all times.
7. Alternate access to residents and businesses to be provided in accordance with Contract Drawings. The Contractor shall provide two days advance notification of access changes to residents and businesses and shall coordinate changes with the Owner and the affected residents and business community.
8. Adequate construction parking meeting local regulations shall be provided by the Contractor.

SECTION 01545 – PROJECT SAFETY REQUIREMENTS

PART 1.0 – WORK SITE SAFETY

1. This Contractor is "Prime Contractor"

1. The Contractor shall, for the purposes of the Occupational Health and Safety Act-Alberta (the Act), and for the duration of their work of this Contract:

    1. Be the "prime contractor" for the "work site", and
    2. Do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with this Act and the regulations in respect of the work site, and

2. The Contractor shall direct all Subcontractors, other contractors, employers, workers and any other persons at the "work site" on safety related matters, to the extent required to fulfil its "prime contractor" responsibilities pursuant to the Act, regardless of:
    1. Whether or not any contractual relationship exists between the Contractor and of these entities, and
    2. Whether or not such entities have been specifically identified in this Contract.

3. The Owner does not anticipate that there will be any contractors, other than those performing the work of this Contract, engaged in work at the "work site" during the performance of the work of this Contract.

PART 2.0 - GENERAL

1. General

1. Observe and enforce construction safety measures required by Federal and Provincial Governments, Worker's Compensation Board and municipal statutes and authorities.
2. In the event of conflict between any provisions of above authorities the most stringent provision governs.
3. The Contractor shall be responsible for the safety of all persons and property on or about the project and for ensuring that the work is performed in accordance with all applicable safety requirements.

2. Safety Program

1. Develop, maintain and supervise for the duration of the work a comprehensive safety program that will effectively incorporate and implement all required safety precautions.
2. The program shall, as a minimum, respond fully to the requirements of all applicable laws, ordinances, rules, regulations and orders and general construction practices for the safety of persons or property, including without limitation any general safety rules and regulations of the Owner and any Worker's Compensation or Occupation Health and Safety legislation or regulations that may be applicable.
3. Provide a copy of the safety program to the Consultant for delivery to the Owner prior to the commencement of construction.

3. Safety Officer

1. Designate a safety officer who shall be qualified and authorized to supervise and enforce compliance with the safety program.

4. Safety Meetings

1. Arrange regular safety meetings at the Contractor's expense.
2. Such meetings shall occur no less frequently than once per week.
3. Record the minutes of such meetings and maintain a complete file for review by the appropriate authorities.
4. Ensure invitation is extended to the Owner's safety representative to attend these meetings.

5. Safety Equipment

1. Supply and maintain, at the Contractor's own expense, at the office or other well-known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the governing authorities.

6. Fire Prevention and Protection

1. Perform all work in a fire safe manner.
2. Comply with all applicable governmental requirements and supply and maintain at the job site adequate and proper fire-fighting equipment.

7. Accidents and Accident Reporting

1. Except as otherwise agreed to in the Contract, supply and maintain all articles necessary for giving first aid to any person who may be injured on the job site and establish an emergency procedure for the immediate removal of any injured person to a hospital or a doctor's care in accordance with applicable legislative and regulatory requirements.
2. Report in writing to the Owner and the Consultant all accidents of any sort arising out of or in connection with the performance of the work whether on or adjacent to the job site, giving full details and statements of witnesses within 24 hours.
3. If death or serious injuries or damages are caused, the accident shall be reported by the Contractor to the Owner and the Consultant by telephone or messenger in addition to any reporting required under provincial laws and regulations within 2 hours.
4. If a claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report he facts in writing to the Owner and the Consultant, giving full details of the claim.

SECTION 01560 – ENVIRONMENTAL CONTROLS

PART 1.0 – GENERAL

1. Hours of Work

1. The Contractor shall not commence work operations prior to 07:00 hrs and must not work past 22:00 hrs.

2. Noise Control

1. The Contractor shall comply with the requirements of municipal and/or provincial bylaws regarding noise abatement and hours of work and shall take all necessary steps to ensure the generation and transmission of noise and vibration which is found to be objectionable is corrected at no additional cost to the Owner and to the satisfaction of the Consultant.

3. Dust Control

1. Perform the work in a manner that will not produce an objectionable amount of dust as determined by the Owner. Dust control measures shall be paid for by the Contractor.

4. Pollution Control

1. Perform the work in conformance with the applicable sections of the Provincial Regulations with respect to air and water pollution control requirements.

5. Disposal of Wastes

1. Burying of rubbish and waste on site is not permitted.
2. Disposal of waste or volatile materials into waterways, storm or sanitary sewers is not permitted.
3. Pumping or draining of water containing silt in suspension into waterways, sewers or drainage systems is prohibited.

6. Work Adjacent to Waterways

1. Prohibit operation of construction equipment in waterways.
2. Do not remove borrow material or dump excess fill material into waterways.
3. Precautions shall be taken to avoid siltation of any water course.

4. Deleterious material shall not be deposited into any water course or storm sewer system, nor shall it be allowed to be transported into any water course through surface run-off.
5. Disturbance to the bed or bank of any water course shall not be permitted.
6. All disturbed areas adjacent to any water course shall be stabilized, restored and reclaimed as soon as possible following construction, and mitigative measures (ie. silt fences) shall be taken to ensure that surface run-off entering any water course does not contain deleterious material.

7. Site Clearing and Plant Protection

1. Take precautions to prevent depositing mud or debris on public or private roadway adjacent to the work. Clean up immediately, otherwise the Consultant will direct necessary cleanup with all costs charged to the Contractor.

8. Erosion and Sediment Control

1. Contractor is to adhere (at his own expense) to the Alberta Transportation Guidelines for Erosion and Sediment Control, unless specified otherwise in the Contract Documents.
2. Maintain silt fences.
3. Maintain water truck on site at all times for dust control.
4. Maintain site drainage prior to catch basin installation, to ensure that all run-off from the site is directed to on-site trapped low storage.
5. Prevent migration of run-off off of the site.
6. It run-off must be directed offsite, ensure that silt fences are installed to intercept run-off.
7. Provide vehicle wash station on site to eliminate the potential of mud tracking to adjacent properties and/or roadways.

SECTION 01601 – MATERIAL AND EQUIPMENT

PART 1.0 – GENERAL

This section includes a description of materials or product quality and provides general guidelines regarding workmanship, including: Reference standards. Product quality, availability, storage, handling, protection and storage. Manufacturer's instructions. Workmanship and coordination. Existing facilities.

1. Related Sections

1. Section 01020 – Quality Control

2. Reference Standards

ACI	American Concrete Institute
ANSI	American National Standards Institute
ASSHTO	American Association of State Highway Transportation Officials
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CEC	Canadian Electrical code
CAN	National Standard of Canada
CANl	National Standard of Canada/Canadian Gas Association
CAN2	National Standard of Canada/Canadian General Standards Board
CAN3	National Standard of Canada/Canadian Standards Association
CAN4	National Standard of Canada/Underwriter's Laboratories of Canada
CGSB	Canadian General Standards Board
CAN/CSA	National Standard of Canada/Canadian Standards Association
CNTA	Canadian Nursery Trades Association
CSA	Canadian Standards Association
CSPI	Corrugated Steel Pipe Institute
ECUSR	Electrical and Communications System Regulations, Province of Alberta
ISA	International Society of Arboriculture
ISNEA	Illuminating Engineering Society of North America
NBC	National Building Code
MUTCD	Manual of Uniform Traffic Control Devices
RTAC	Regional Transportation Advisory Committee
ULC	Underwriter's Laboratories of Canada
UTCD	Uniform Traffic Control Devices (U.S.)

1. Conform to these standards, in whole or in part as specifically requested in the Specifications.

2. If there is question as to whether any product or system is in conformance with applicable standards, the Consultant reserves the right to have such products or systems tested to prove or disprove conformance .
3. The cost for such testing will be borne by the Owner in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.
4. Conform to the latest date of issue of referenced standards in effect on the date of submission of bids, except where a specific date or issue is noted.

3. Quality

1. Products, materials, equipment and articles (referred to as products throughout the specifications) incorporated in the Work shall be new not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
2. Defective products whenever identified prior to the completion of Work, will be rejected regardless of previous inspections. Inspection does to relieve responsibility but is a precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
3. Should any dispute arise as to the quality or fitness of products, the decision rests strictly with the Consultant based upon the requirements of the contract documents.
4. Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building
5. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations except where required for operating instructions or when located in mechanical or electrical rooms.

4. Availability

1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify the Consultant of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
2. . In the event of failure to notify the Consultant at commencements of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available products of similar character at no increase in Contract Price.

5. Storage, Handling and Protection

1. Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturers' instructions when applicable.
2. Store packaged or bundled products in original and undamaged condition with manufacturers seal and labels intact. Do not remove from packaging or bundling until required in the work.
3. Store products subject to damage from weather in weatherproof enclosures.
4. Keep sand when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
5. Remove and replace damaged products at own expense and to the satisfaction of the Consultant.

6. Inspection and Take Over Procedures

1. Prior to application of Construction Completion Certificates, carefully inspect the work and ensure it is complete and the site is clean. Notify the Consultant in writing, of satisfactory completion of the work and request an inspection.

SECTION 01700 – CONTRACT CLOSEOUT

PART 1.0 – GENERAL

1. Related Sections

1. Section 01000 – General Instructions
2. General Conditions of the Contract: Fiscal provisions, legal submittals and other administrative requirements.

2. Final Cleaning

1. When the work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining work.
2. Haul surplus or salvage materials that are the property of the Owner to the Owner's storage site.
3. Remove surplus or salvaged materials belonging to the Contractor from the site.
4. When the work is totally performed, remove remaining products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner.
5. Remove waste materials and debris from the site at regularly schedules times or dispose of as directed by the Consultant. Do not burn waste materials on site.
6. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
7. Clean haul routes.
8. Ensure clean and functioning accesses.
9. Broom clean paved surfaces, rake clean other ground surfaces.
10. Clean all catchbasins, manholes, storm and sanitary sewers of any foreign material that may have entered the system during construction.
11. Clean all tar, oil or asphalt from manholes, catchbasins and valve hardware and from all finished concrete surfaces.
12. In case of dispute, the Owner may complete the required cleanup and deduct the cost from any amount owing the Contractor.

3. Record Documents

1. Collect reviewed submittals (per Section 01300) and assemble documents executed by Subcontractors, suppliers and manufacturers.
2. Submit material prior to final Progress Certificate Application.
3. Provide warranties and bonds fully executed and notarized.

4. Submit a final Progress Certificate giving total adjusted Contract Sum, previous payments and monies remaining due.
5. As specified in other sections of the specifications, the Contractor is required to provide a set of engineering drawings with approved changes made during construction and as-built details marked in red for review by the Consultant, who will prepare record drawings. The Contractor is also required to provide service connection reports, survey notes, test results and all other documents kept throughout construction. Such information shall be turned over to the Consultant before both the Construction Completion Certificate is issued and final holdback is released.
6. Record documents shall be neat, legible and accurate.

4. Inspection and Take Over Procedures

1. Prior to application of Construction Completion Certificates, carefully inspect the work and ensure it is complete and the site is clean. Notify the Consultant in writing, of satisfactory completion of the work and request an inspection.

DETAILED SPECIFICATIONS

DIVISION 2 – SITE WORK

SECTION 02113 – STRIPPING
SECTION 02311 – SITE GRADING
SECTION 02315 – TRENCH EXCAVATION, BACKFILL AND COMPACTION
SECTION 02317 – ROADWAY EXCAVATION AND BACKFILL
SECTION 02342 – GEOTEXTILES – WOVEN AND NON-WOVEN
SECTION 02371 – RIP-RAP
SECTION 02563 – MANHOLES AND CATCH BASINS
SECTION 02610 – CORRUGATED STEEL PIPE CULVERTS
SECTION 02701 – AGGREGATES - GENERAL
SECTION 02911 – TOPSOIL PLACEMENT AND FINISH GRADING
SECTION 02921 – SEEDING
SECTION 02924 – HYDROSEEDING

SECTION 02113 – STRIPPING

PART 1.0 – GENERAL

1. Description

1. This section specifies requirements for stripping of topsoil and organic material from the site.
2. The work includes:
    1. Stripping and stockpiling for re-use.

2. Regulations

1. Abide by provincial and municipal regulations with regard to diversions or alterations to drainage patterns

3. Limits

1. Stripping shall not exceed the limits shown on the drawings or as designated by the Consultant.
2. The Consultant may waive stripping of wet land areas, at his discretion.

PART 2.0 – PRODUCTS

Not applicable

PART 3.0 – EXECUTION

1. Notification

1. The Contractor shall notify the Consultant in writing, a minimum of 3 working days prior to commencement of stripping.
2. The Consultant and the Contractor shall inspect the area to be stripped to establish specific requirements and to review procedures, which shall be confirmed in writing by the Contractor

2. Stripping and Stockpiling

1. Load, haul and place in stockpiles as designated by the Owner.
2. Stockpile in a manner that will not endanger persons, the work or adjacent property.

3. Keep topsoil stockpiles separate and do not mix with common excavation.
4. Maintain a minimum of 1 meter separation between topsoil and common excavation material when piling.
5. Leave openings in stockpiles so that fields are accessible to Owner.

3. Mixing

6. If the topsoil and subsoil are mixed and the topsoil is adversely affected, the Contractor shall, at his own expense, engage a soils specialist to determine the necessary remedial work, and shall perform the required work.

END OF SECTION

SECTION 02311 – SITE GRADING

PART 1.0 – GENERAL

1. Description

1. This section specifies requirements for excavation, drainage excavation, borrow excavation, embankment construction, and disposal of material in accordance with this specification and conforming to lines, grades, dimensions and typical cross sections shown on plans or established by Engineer.

2. Definitions

1. Topsoil Stripping: Excavation and stockpiling of material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping, and seeding.
2. Rock Excavation: Rock Excavation shall include the removal from their original position of rock in solid beds or masses, and boulders or detached rock having a volume of one half cubic metre content or more ; and placing, disposing or stockpiling of the materials as directed by the Consultant.
3. Common Excavation: Excavation, placement, and compaction in embankments of all on-site materials whatever nature, which are not included under the definition of topsoil stripping, waste excavation, borrow excavation, or rock excavation, including dense tills, hardpan, frozen materials, and partially cemented materials which can be ripped and excavated with heavy construction equipment.
4. Waste Excavation: Excavation and removal from site or disposed on-site as designated by the Engineer of any material unsuitable for use in work or surplus to requirements.
5. Borrow Excavation: Excavation, delivery to site, placement, and compaction of suitable material obtained off-site or as shown on the drawings and used in embankment.
6. Transition Material: Refers to the "brown dirt" layer of material encountered between the bottom of topsoil and top of common material. Transition material to be treated as waste excavation.
7. Embankment: Material derived from usable excavation and placed above original ground or in stripped or undercut areas up to subgrade level.
8. Subgrade Elevation: Elevation immediately below pavement structure.

3. Regulations

1. Adhere to municipal, provincial, and national codes if blasting is required.

4. Traffic Provisions

1. Provide and maintain roadways, walkways and detours, for vehicular and pedestrian traffic as directed by Engineer.

5. Measurement for Payment

1. Excavated materials to be measured and paid for in cubic metres for insitu cut, or for in-place fill. Volumes will be calculated by the Engineer.
2. Volume excavated from solid rock masses to be calculated from cross sections of original rock surface and design grade line for excavation. Excavated boulders and rock fragments to be measured by Engineer and volume determined by measuring three maximum mutually perpendicular dimensions.
   No additional payment to be made for:
   1. Unnecessary excavation beyond lines established.
   2. Extra handling of windrowed materials blended on embankment slopes.
   3. Moisture adjustment of material.
   4. Construction, maintenance and restoration of haul roads.
   5. Watering for dust control.
   6. Over haul.

PART 2.0 – PRODUCTS

1. Materials

1. Embankment materials require approval of Engineer.

PART 3.0 – EXECUTION

1. Compaction Equipment

1. Compaction equipment must be capable of obtaining required densities for materials on project. Equipment that does not achieve specified densities must be replaced.

2. Water Distributors

1. Apply water with equipment capable of uniform distribution and in a manner acceptable to Engineer.

3. Excavating

1. Advise Engineer sufficiently in advance of excavation operations for initial cross sections to be taken.
2. Maintain grades, cross slopes, pumps or ditches to keep excavations free of running or standing water.

4. Topsoil Stripping

1. Strip topsoil from areas and to depths indicated or directed prior to beginning of excavation and embankment work. Avoid contamination of topsoil and underlying soil.
2. Strip transition material and dispose in designated locations.
3. Topsoil excavated to be stockpiled in a location as directed by Engineer.

5. Rock Excavation

1. If during excavation, material appearing to conform to classification for rock is encountered, notify Engineer in sufficient time to enable measurements to be made to determine volume of rock.
2. Remove rock to 300 mm below sub-grade elevation indicated.
3. Provide effective drainage to ditches, leaving no undrained pockets in foundation.
4. Scale down rock slopes and remove rock fragments which are liable to slide or roll down slopes.

6. Waste Excavation

1. Notify Engineer whenever unsuitable materials are encountered in cut or embankment sections and remove unsuitable materials to depth and extent directed.
2. Dispose of waste excavation in waste site designated. If no site is designated dispose of material off-site in an area located by Contractor and approved by Engineer. Costs associated with disposal to be included in unit rate for waste excavation.

7. Borrow Excavation

1. Use all suitable materials removed from excavations in embankments before taking materials from borrow areas.
2. Obtain from borrow areas indicated on plans additional suitable embankment material.
    1. Engineer to designate location and extent of borrow areas, and allowable depth of cutting.
    2. Shape edges of borrow areas on slopes of 4:1 and provide drainage as directed.
    3. Trim and leave borrow pits in a condition to permit accurate measurement of material removed.

8. Blasting

1. Control blasting to minimize flying particles.
2. Treat trees damaged or scarred by flying rock with an approved tree paint.
3. Cut, remove, and place in a designated area trees felled or severely damaged by blast or flying rock.

9. Side Ditches

1. Construct side ditches to depths and widths indicated or directed, to permit ready flow of surface water.
2. Maintain and keep ditches open and free from debris until final acceptance of work.

10. Common Excavation

1. When directed, scarify or bench existing slopes in side hill or sloping sections to ensure a proper bond between new materials and existing surfaces. Obtain prior approval of method to be used.
2. Scarify existing ground to a depth of 150 mm and mix embankment material with existing materials to ensure a good bond.
3. Do not place material which is frozen or place material on frozen surfaces.
4. Maintain a sloped surface during construction to ensure ready run-off of surface water.
5. After a period of wet weather remove or scarify, dry and recompact embankment materials softened by moisture.
6. Wetting or drying of fill material shall be carried out such that in place fill has a moisture content of optimum plus or minus 2%.

7. With material containing less than 25% by volume of stone or rock fragments larger than 100 mm:
    1. Place and compact to full width in uniform layers not exceeding 150 mm loose thickness. Engineer may authorize thicker lifts if specified compaction can be achieved.
    2. Compact each layer to a density of between 95% and 100% of Standard Proctor.
8. Where material consists principally of rock:
    1. Place to full width in layers of sufficient depth to contain maximum sized rocks but in no case is layer thickness to exceed 1 m.
    2. Individual rock fragments not exceeding 150 mm in vertical dimension to be permitted provided their vertical dimension does not exceed one-third of fill section depth.
    3. Carefully distribute rock material to fill voids with smaller fragments to form a compact mass.
    4. Fill surface voids at subgrade level with rock spalls or selected material to form an earth-tight surface.
    5. Boulders and rock fragments with dimensions exceeding 75 mm not to be placed within 150 mm of pavement subgrade elevation.
9. Report to the Engineer any damage to existing trees and/or shrubs.

11. Dust Control

1. Control dust during site grading operations by watering.

12. Finishing and Tolerances

1. Blade finished surfaces in cut and fill areas free from ruts, depressions, rocks in excess of 75 mm, and debris.
2. Roll finished surfaces to a tight dense condition.
3. Surfaces to be within 100 mm of design elevations but not uniformly high or low.

13. Maintenance

1. Maintain finished surfaces in a condition in accordance with this Section until acceptance by Engineer.

SECTION 02315 – TRENCH EXCAVATION, BACKFILL AND COMPACTION

PART 1.0 – GENERAL

1. Description

1. This section refers to the supply and installation of crushed gravel for the road granular sub-base and base

2. Related Work

1. Section 02342 –Geotextiles – Non-Woven and Woven

3. Definitions

1. Common excavation: Excavation, placement and compaction in embankments of all on site materials whatever nature, which are not included under the definition of topsoil stripping, waste excavation, borrow excavation or rock excavation; including dense tills, hardpan, frozen materials and partially cemented materials and rock, concrete or masonry less than 1.0 m^3 in volume .
2. Rock excavation: Rock excavation shall be paid for when the material encountered consists of mass or bedrock or a boulder of volume greater than 1 cubic meter and requires for its removal drilling, blasting wedging, sledging, barring or breaking away from its parent mass. It shall be the Contractors responsibility to demonstrate, to the Consultant's satisfaction that the material cannot be removed or that difficulty is being experienced through excavation by conventional means. In doing so, the Contractor may be required by the Consultant to seek and explore planes of weakness or layers that may ease the excavation process. Frozen material is not classified as rock.
3. Bedding Material: Materials placed at the bottom of the trench beneath and up to the spring line of the pipe.
4. Pipe foundations: Sub grade material immediately below bedding.
5. Initial Backfill: Non frozen material placed within the trench, above the spring line of the pipe to 300 mm above the crown of the pipe in layers not exceeding 150mm and compacted by manual forces (wacker tampers) to 98 % Standard Proctor Density.
6. Class 1 Backfill: Class 1 backfilling shall consist of backfilling the trench with non-frozen sand or gravel compacted in even layers not exceeding 300 mm in depth so that there is no subsequent subsidence in the trench. Backfill shall be compacted to a minimum of 100% Standard Proctor Density. Fillcrete may be used in lieu of Class 1 backfill.

7. Class 2 Backfill: Class 2 backfilling shall consist of replacing the non-frozen excavated material in even layers not exceeding 300 mm in depth, and compacting each layer by mechanical means to 95% Standard Proctor Density in landscaped areas and 98% Standard Proctor Density within the road carriage way.
8. Bedding Class: Pipes to be bedded to one of following classes as specified on drawings

Class A

1. Concrete cradle: Pipe is bedded in concrete up to the outside pipe diameter for a minimum width of pipe diameter plus 200 mm. Above cradle, granular backfill is placed and compacted to 300 mm above pipe to a density of 98% Standard Proctor Density .
2. Concrete arch: Pipe is bedded in carefully compacted granular bedding to spring line. Top half of pipe is covered with concrete to minimum depth of 14 of inside diameter of pipe. Arch width is to be a minimum of pipe outside Diameter plus 200 mm.

Class B

1. Pipe is bedded on a minimum 100 mm thickness of compacted approved granular material placed on an undisturbed non-frozen trench bottom. Approved granular material shall be hand placed and compacted to a density of 98% Standard Proctor Density in 150mm layers, or to the spring line of the pipe whichever is less, for the full width of the trench up to300mm above the crown of the pipe. Shape bed true to grade and to provide continuous, uniform bearing surface for barrel of pipe. Shape transverse depressions as required to receive bell if bell and spigot pipe is used. Gradation of bedding material shall be as per Part 2.1.2 of this Section.

9. Granular bedding: Pipe is bedded on compacted approved granular material placed on a non-frozen flat trench bottom, depth of bedding to be:

Pipe Diameter (mm)	Bedding Depth (mm)
675 and smaller	100
750 and larger	150

10. Granular bedding must be compacted to 100% Standard Proctor Density with an optimum moisture content of+ 1% to -2% and pass a roll test prior to the placement of subsequent layers. The required compaction can be generally best achieved if the soil is dried or moistened to within +/- 3% of the optimum moisture content.
11. Fill concrete: Controlled density, low strength concrete used as trench backfill material where specified by Consultant.

12. Topsoil: The top layer of soil containing organic material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

4. Protection

1. Existing Buried Utilities

1. Size, depth, and location of existing utilities shown on Drawings are for guidance only; completeness and accuracy are not guaranteed.

2. Prior to commencing any excavation work, notify applicable utility authorities, and establish location and state of use of buried services. Clearly mark such locations to prevent disturbance during work.

3. Maintain and protect from damage, water, sewer, gas, electric, or other utilities encountered.

4. Obtain written authorization of owner of utility and Engineer before moving or otherwise disturbing utility.

2. Existing Surface Features

1. Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within right of way or adjoining properties from damage while work is in progress. Repair to Consultant's satisfaction any damage which may occur.

2. Where excavation necessitates root or branch cutting do so only under direct control of the Consultant.

3. Shoring and Bracing

1. Whenever shoring, sheeting, timbering and bracing of excavations is required, engage services of a Professional Engineer to design and acne responsibility for adequacy of shoring and bracing. Professional Engineer is to be registered in Alberta.

2. When requested by the Consultant, submit for review drawings and calculations signed and stamped by the Professional Engineer responsible for their preparation.

3. Close sheeting, when required, to be designed and constructed to prevent adjacent soil or water from entering excavation.

4. Access

    1. Maintain unobstructed access to fire and police appurtenances, telephone, electric, water, sewer, gas or other public utilities and private properties.

5. Flooding

    1. Protect open excavation against flooding and damage from surface water runoff or groundwater seepage.

5. Safety Requirements

1. Observe and adhere to all applicable sections of the Alberta Regulations 271/76 or any revisions thereto made under the Occupational Health and Safety Act covering the worker safety in trenches and excavations, shoring and bracing as required. Open cut trenches shall be shaped as required by the Act and the Accident Prevention Regulations of the Occupational Health and Safety Division of the Department of Labor and Municipal Ordinances and as may be necessary to protect life, property, the environment and the Work.

2. Adhere to all crossing permit (railway, pipeline, telecommunications, etc.) requirements.

3. Provide barricades, flares, etc. To adequately denote area of excavation adjacent to roadways and public thoroughfares.

PART 2.0 – PRODUCTS

1. Bedding and Initial Materials

1. Well graded sand consisting of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
2. The material shall meet the following gradation:

Sieve Size (mm)	Percent Passing (by weight)
12.5	100

5	90-100
1.25	65-95
0.630	50-75
0.315	35-60
0.160	18-45
0.08	2-10

3. Native hand placed material may be used as initial backfill gradation.
4. Material to be used as specified by Consultant or as shown on drawing.
5. Concrete required for Class A bedding, grades, supports, encasement to be 25 MPa sulphate resistant (Type 50) to Section 03300.
6. Native backfill to be approved material selected from trench excavation or other source, unfrozen and free from deleterious material and with moisture content within 2% of optimum.

2. Roadway Trench Backfill Material

1. To minimize fill settlement under self weight, excavated soil with a moisture content exceeding 2% of optimum shall be conditioned and dried prior to use as backfill.
2. Wet fill material must be dried or blended with drier material to produce a uniform homogenous material prior to use as a trench backfill. If this is not practical, the wet material should be wasted or used in landscape areas and berms where bearing capacity is not required.
3. Suitable replacement soils would include imported clay with a moisture content within 2 % of its optimum moisture content for compaction or imported granular materials suitable for compaction.

3. Class I Backfill Material

1. Material for Class l backfill shall consist of sound, hard, durable, uniformly graded crushed gravel and shall not contain organic or soft materials, materials that break up when alternately frozen and thawed or wetted and dried, or other deleterious materials. When compacted to +l% to -2% of the optimum moisture content to not less than 95% of the maximum dry density corrected for the stone content as determined by ASTM 0698, the material shall have a minimum bearing ratio as defined ASTM Dl 883, of fifteen percent (15%) .
2. Class 1 backfill shall meet the following gradation when tested to ASTM C136:

Sieve Size (mm)	Percent Passing (by weight)
60	100
16	32-85
5.0	20-65
0.315	6-30
0.08	2-10

4. Samples

1. At least two (2) weeks prior to commencing work, inform of proposed source of granular materials.
2. The Contractor shall provide a sieve analysis of the material for approval.
3. Sand and gravel shall be approved before being used.

5. Filter Fabric

1. Please refer to Section 02342-Geotextiles - Non-Woven and Woven.

6. Fill Crete

1. Non-shrinking fill made up of a mixture of Portland cement, sand, water and admixtures conforming to the following:
    1. Minimum 28 day compressive strength 1.00 to 2.00 MPa
    2. Slump 100mm±25mm
    3. Portland cement Type 10
    4. Air entrainment 5% ±1%

PART 3.0 – EXECUTION

1. Site Preparation

1. Remove trees, shrubs, vegetation, fences and other obstructions, ice and snow, from surfaces to be excavated within limits indicated.
2. Strip top soil from within limits of excavation and stockpile as directed, for rereading after backfilling. Avoid intermixing of subsoil fill materials with organic material and from other forms of contamination.

2. Dewatering

1. Keep excavation dry while work is in progress.

2. Dispose of water in a manner not detrimental to public health, environment, public and private property or any portion of work completed or under construction.

3. Excavation

1. Excavate to lines, grades, elevations and dimensions indicated on drawing. Ground profiles are approximate only. Precise line and grade will be set out by Consultant. Allow Consultant two working days advance notice to set out line and grade.

1. Trench Width:

1. The minimum trench width below the crown of the pipe shall be not less than the nominal diameter of the pipe plus 400 mm. The maximum width of the trench below the crown of the pipe including shoring shall be not more than the nominal diameter of the pipe plus 600 mm or not more than a total width of 900 mm, whichever is the larger. Where the maximum trench width is exceeded, the Contractor shall, at his own expense, provide special bedding or take other precautions as directed. Where more than one pipe is laid in the same trench, the minimum and maximum widths shall be as directed.
2. The Contractor shall confine his activities to the immediate area of the trench. All activities outside trench boundaries shall be performed so as not to damage other existing features. The Contractor shall generally have the option of using either vertical shored trenches or Vee trenches. Every effort shall be made to restrict the trench widths to minimize the area disturbed.
3. All excavated material shall be piled at least 1.0 m clear of the trench top to prevent material from falling back into the excavation. The material shall be piled in such a manner that it will not endanger the work, or obstruct other work or rights-of-way. Sufficient clear space must be left on one side of the trench to accommodate the surveyor's stakes.
4. The trench shall be excavated so that the pipe can be laid to the alignment, grade and depth required.

2. Trench Rock Excavation:

1. Where excavation is made in rock or where excavation is made in a material which cannot provide an even, uniform and smooth surface; or where large stones are encountered in the trench, such material shall be removed to provide a clear distance between any part or projection of such material and the surface of all pipe and fittings of not less than 150 mm for 600 mm outside diameter pipe or less, and 200 mm for pipe having an outside diameter greater than 600 mm. The sub grade shall then be made by backfilling with an approved sand compacted in 75 mm layers at the Contractors expense. Excavated rock shall not be used for backfill. The finished subgrade surface shall be shaped by hand tools to provide a uniform and continuous support for the pipe.

2. Blasting for excavation will be permitted only with the approval of the Town of Drayton Valley and only when proper precautions are taken for the protection of persons or property. The Contractors method of procedure in blasting shall conform to provincial statutes and municipal ordinances.
3. The sub grade shall provide a uniform and continuous support for the pipe and fittings on solid undisturbed ground. Any over excavation by the Contractor below the required grade shall be backfilled at his expense with an approved compacted sand.

2. Cut pavement or sidewalk. Neatly along limits of proposed excavation.
3. Where edge of existing pavement is damaged as a result of trench excavation in shoulder, a minimum 300 mm width to be cut neatly and continuously and reinstated in accordance with clause 3.9 of this section. Work included under restoration.
4. Notify Consultant when soil at proposed elevation of trench bottom appears unsuitable for foundation of installation. Remove unsuitable material and replace with approved 40 mm screened rock bedding.
5. Notify Consultant if new construction conflicts with a discovered obstruction. Allow Consultant sufficient time to consider alternative alignment to avoid conflict with obstruction. Modify alignment as directed by Consultant.
6. Unless otherwise authorized by the Consultant, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m of open trench at end of days operation.
7. Stockpile suitable excavated materials required for trench backfill in an approved location.
8. Dispose of surplus and unsuitable material at a waste site approved by the Consultant/Owner.
9. Do not obstruct flow of surface drainage or natural watercourses.
10. Obtain Consultant's approval for method of excavation.
11. Excavate rock to a level 150 mm below the barrel of pipe

4. Trench Bottom Preparation

1. Where required due to removal of unsuitable material or unauthorized over excavation, bring bottom of excavation to design grade with approved material.
2. Unstable Subgrade:
    1. Where the sub grade of the trench is unstable or will not properly support the pipe, or where it contains materials harmful to the pipe such as ashes, cinders, refuse, vegetable or organic material, the Contractor shall excavate such material to the width, depth and length as directed and dispose of the material. The subgrade shall then be made by backfilling with an approved stabilizing gravel compacted in 75 mm layers. The finished subgrade surface shall be shaped by hand tools to provide a uniform and continuous support for the pipe. The stabilization gravel may be completely wrapped in filter fabric as specified. The fabric shall be overlapped a minimum of 500 mm at

all joints to provide a full, continuous wrap and shall be smooth and free of tension, stress, folds, wrinkles or creases.

2. Where the subgrade cannot be made to properly support the pipe by replacing unsound material with stabilizing gravel, the Contractor shall construct a foundation for the pipe in accordance with a stamped drawing prepared at the time by a Professional Engineer .

3. Payment for this work shall be made in accordance with the provisions for extra work unless specified otherwise

5. Pipe Bedding and Initial Backfill

1. Concrete Bedding and Encasement
    3. Do concrete work to Section 03300. Place concrete details indicated or directed
    4. Pipe may be positioned on concrete blocks or cradles to facilitate placing of concrete bedding. When necessary rigidly anchor or weight pipe to prevent flotation when concrete is placed.
    5. Do not backfill over concrete until 60% of compressive concrete strength has been attained or within 7 days after placing.
2. Granular Bedding
    1. Place granular bedding materials to Class B unless otherwise indicated on drawings.
    2. Shape bed true to grade to provide continuous uniform bearing surface for pipe exterior. Do not use blocks when bedding pipe.
    3. Shape transverse depressions in bedding as required to accommodate bells when applicable.
    4. Compact full width of bed to a density of98% Standard Proctor.
    5. Place layers simultaneously on both sides of installed work to equalize loading.
    6. Place material by hand under, around, and over pipe until 300 mm of cover is provided. Dumping material directly on pipe will not be permitted

6. Backfilling

1. Bedding and initial backfilling shall be as specified for the particular pipe installed.
2. General backfilling:
    1. Class 1 backfill as defined in Section 1.2 - Definitions shall be used underneath all existing asphalt road or concrete areas. Class 2 backfill as defined in Section 1.2. Definitions shall be used in all other areas including future roads, boulevards and open areas.
    2. No boulders, rock, ice, snow, organic material or debris shall be permitted in the trench. These unsuitable materials shall be hauled away.

3. All surplus excavated material shall also be hauled away, or disposed of as Directed. In the event of deficiency of backfill material, suitable material shall be supplied by the Contractor at his expense.
4. All trenches shall be backfilled as the work proceeds and no more than 30 m shall be left open at the end of a day's work.

7. Backfill Compaction

1. The Contractor shall be responsible for adequate compaction of the trenches and for the correction of settlement during the maintenance period of the Contract. Mechanical compaction equipment shall not be used until there is sufficient cover to prevent damage to the pipe.
2. The type of compaction equipment shall be chosen with regard to minimizing the vibration effect on nearby buildings and utilities. The Contractor shall inspect the Condition of buildings prior to construction. The Contractor is responsible for any damage caused to buildings due to construction.

8. Testing Backfill Compaction

1. Compaction results shall be based on a minimum of one density test per 100 metres of trench for each 1.0 metre of compacted vertical backfill. Additional tests may be called for by the Town of Drayton Valley as deemed necessary.
2. If a density test indicates insufficient compaction at any depth, then two more densities, that are proportionally representative of trench length, shall be taken at that depth. If the average of these tests is below the required density, the trench shall be re-excavated and re-compacted to meet the specified density.
3. This testing in no way relieves the Contractor of his maintenance responsibilities with respect to settlements as specified. The Contractor shall repair any settlement and damaged surface improvements due to the settlement which occurs during the maintenance period.
4. The cost of all initial testing will be borne by the Contractor. Non-conformity with the specified density or moisture content shall constitute sufficient grounds for rejection of the work.

9. Trench Backfill and Compaction for Shallow Utilities

1. This clause shall apply to the installation of power, gas, telephone and cable in new development areas.
2. Road and lane crossings, roads, lanes or other areas that will be subject to traffic, are to be backfilled as outlined under Class 1 or Class 2 backfill in clause 1.2 of this section.

3. Trenches· in landscaped areas; such as road ditches within road right-of-way; shall be backfilled and compacted as follows:
    1. Place initial 350 mm ±lift of native backfill material and compact to 95% Standard proctor density.
    2. Place balance of backfill material in 300mm lifts and compact to 95% Standard Proctor Density.
    3. Following compaction of final lift, fill depression with native material leaving a slight hump over trench to accommodate future settlement. Level ssurrounding area.

10. Fill Concrete Backfill

1. Place bedding and initial backfill material as per clause 3.6.
2. Backfill with fill concrete described in Section 2.5 to level directed by Consultant.
3. Vibrate to ensure all voids are filled
4. Allow 48 hours curing time prior to working over top of fill concrete.

11. Restoration

1. Replace topsoil as directed by Consultant
2. Restore traveled areas to the pavement or concrete structure shown on the contract drawing.
3. Clean and reinstate areas affected by work as directed.

END OF SECTION

SECTION 02317 – ROADWAY EXCAVATION AND BACKFILL

PART 1.0 – GENERAL

1. Description

1. This section specifies requirements for road excavation, road drainage excavation, borrow excavation, embankment construction and disposal of material in accordance with specification and conforming to lines, grades, dimensions, and typical cross sections shown of plans or established by Consultant.

2. Related Work

1. Section 02113 -Stripping

3. Definitions

1. Topsoil Stripping: excavation and stockpiling of material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
2. Common Excavation: excavation, placement and compaction in embankments of all on site material whatever nature, which are not included under the definition of topsoil stripping, waste excavation, borrow excavation or rock excavation, including dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
3. Waste Excavation: excavation and removal from site or disposed on site as designated by Consultant of any material unsuitable for use in work or surplus to requirements.
4. Rock Excavation: rock excavation shall be paid for when the material encountered consists of mass or bedrock or a boulder of volume greater than 1.0 m^3. Such rock excavation is divided into two categories; Type 'A' and Type 'B', contingent upon its hardness and difficulty experienced in excavation. It shall be the Contractors responsibility to demonstrate to the Consultant's satisfaction that the material cannot be removed or that difficulty is being experienced through excavation by conventional means. In doing so, the Contractor may be required by the Consultant to seek and explore planes of weakness or layers that may ease the excavation process. Frozen material is not classified as rock.
    1. Type 'A' Rock: Type ‘A’ rock refers to materials such as fractured sandstone, shale or ledge rock which can be removed by a backhoe for the depth of excavation. For open excavation, it refers to materials which in the opinion of the Consultant result in:

a)Substantial delay or decrease in the normal rate of excavation using conventional equipment.

b) Significant damage or wear to the excavating equipment.

2. Type 'B' Rock: Type ‘B’ rock required drilling, blasting, wedging or jack hammering to remove as determined by the Consultant

5. Borrow Excavation: Excavation, delivery to site, placement and compaction of suitable material obtained off site and used in embankment.
6. Unsuitable Sub grade: Material at design sub grade level not suitable for pavement structure sub grade, shall be removed as directed by Consultant and replaced with suitable material.
7. Embankment: Material placed above original ground or in stripped or undercut areas up to sub grade elevation.
8. Pavement Structure: Combination of layers of unbound or stabilized granular sub base, base and asphalt or concrete surfacing.
9. Sub grade Elevation: Elevation immediately below pavement structure.
10. Sub grade Preparation: Shaping, scarifying, conditioning, blading and compacting of sub grade.

4. Requirements of Regulatory Agencies

1. Adhere to municipal, provincial, and national codes if blasting is required.

5. Traffic Provisions

1. Provide and maintain roadways, walkways and detours for vehicular and pedestrian traffic as directed by Consultant.

6. Protection

1. Existing Surface Features
    1. Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within right of way or adjoining properties from damage while work is in progress. Repair to Consultant’s satisfaction any damage, which may occur.
2. Trees and Shrubs
    1. Where excavation necessitates root or branch cutting, do so only under direct control of the Consultant.
    2. Protect existing trees and shrubs.

7. Safety Requirements

1. Adhere to municipal and provincial requirements relating to safety of trenching work, including shoring and bracing as required.
2. Adhere to all crossing permit (railway, pipeline, telecommunications duct, etc.) requirements.

8. Traffic Provisions

1. Provide and maintain roadways, walkways and detours for vehicular and pedestrian traffic as directed by Consultant.
2. Provide barricades, flares, etc. to adequately denote area of excavation adjacent to roadways.

PART 2.0 – PRODUCTS

1. Materials

1. Embankment Material
    1. Embankment materials to be approved by the Consultant.
2. Sub grade replacement material.
    1. Unsuitable sub grade replacement aggregates shall consist of the following:
        1. Native fill sand.
        2. 75 mm or 150 mm pit run gravel
        3. Other material approved by the Consultant.

Material to be used as specified by the Consultant, or as shown on the drawing.

PART 3.0 – EXECUTION

1. Compaction

1. Compaction equipment must be capable of obtaining required densities for materials on project. Equipment that does not achieve specified densities must be replaced.
2. Field tests for density and moisture content shall be taken by a third party competent in materials testing. The cost of this testing shall be borne by the Contractor. Non- conformity with the specified density or moisture content shall constitute sufficient grounds for rejection of the work

3. Trench backfill encountered in the preparation of the subgrade which has not been compacted sufficiently, shall be excavated and re-compacted.
4. The Contractor shall be responsible for any repair required to road works arising from subsidence of trenches after the completion of the maintenance period of the underground services

2. Testing Compaction

1. Compaction results shall be based on a minimum of one density test per 1,500 m^2 of road. Additional tests may be called for by the Town of Drayton Valley as deemed necessary.
2. Field density tests shall conform to ASTM DI 556, ASTM D21 67, or ASTM D2922 for comparison with a maximum density determined according to ASTM D698 Method "A".

3. Water Distributors

1. Apply water with equipment capable of uniform distribution and in a manner acceptable to Consultant.

4. Excavating

1. Advise Consultant sufficiently in advance of excavation operations for initial cross section to be taken.
2. Maintain crowns, cross slopes, pumps or ditches to keep excavations free of running or standing water.

5. Topsoil Stripping

1. Stripping of topsoil to be in accordance with Section 02113.

6. Rock Excavation

1. If during excavation, material appearing to conform to classification for rock is encountered, notify Consultant in sufficient time to enable measurements to be made to determine volume of rock.
2. Remove rock to 300 mm below sub grade elevation indicated.
3. Provide effective drainage to ditches, leaving no undrained pockets in foundation.

4. Scale down rock slopes and remove rock fragments, which are liable to slide or roll down slopes.

7. Common Excavation

1. Material designated as common excavation to be excavated, hauled and compacted to fill areas up to 1.0 km from the end of cut.

8. Waste Excavation

1. Notify Consultant whenever unsuitable materials are encountered in cut or embankment sections and remove unsuitable materials to depth and extent directed.
2. Dispose of waste excavation at designated waste site. If no waste site is designated dispose of material off site in an area located by Contractor and approved by Consultant. Costs associated with disposal to be included in unit rate for waste excavation. A copy of the site permit or license is to be provided by the Contractor where the solid waste is disposed.

9. Borrow Excavation

1. Use all suitable materials removed from excavation in embankments before taking material from borrow area.
2. Obtain from borrow areas located on project property additional suitable embankment material.
    1. Consultant to designate location and extent of borrow areas, and allowable depth of cutting.
    2. Shape edges of borrow areas on slopes of 4: 1 and provide drainage as directed
    3. Trim and leave borrow pits in a condition to permit accurate measurements of material removed.

10. Unsuitable Subgrade

1. Notify Consultant when unsuitable materials are encountered at design sub grade elevation. Sub cut and dispose of unsuitable material and replace with a compacted approved material. Material shall be placed in successive layers not exceeding 150 mm in depth and compacted to a minimum of 95% Standard Proctor Density below 300 mm of top of subgrade.

2. When sub grade after sub cutting is still unsuitable, geotextile may be installed at direction of Consultant.

11. Subgrade Preparation

1. Please refer to Section 02231 - Subgrade Preparation.

12. Blasting

1. Control blasting to minimize flying particles.
2. Cut, remove and place in a designated area trees felled or severely damaged by blast of flying rock.

13. Side Ditches

1. Construct side ditches to depths and widths indicated or directed to permit ready flow of surface water.
2. Maintain and keep ditches open and free form debris until final acceptance of work.

14. Embankments

1. Scarify, bench or key in existing slopes in side hills or sloping sections to ensure a proper bond between new materials and existing surfaces. Obtain prior approval of method to be used.
2. Scarify existing ground to a depth of 150 mm and mix embankment material with existing materials to ensure a good bond.
3. Do not place material which is frozen, or place material on frozen surfaces.
4. Maintain a crowned surface during construction to ensure ready run off of surface water.
5. After a period of wet weather, remove or scarify, dry and re compact embankment materials softened by moisture.
6. Wetting or drying of fill material shall be carried out such that in place fill has a moisture content of +/-3% of optimum.
7. With material containing less than 25% by volume of stone or rock fragments larger than loom.
    1. Place and compact to full width in uniform layers not exceeding 150 mm loose thickness. Consultant may authorize thicker lifts if specified compaction is demonstrated to be achievable.
    2. Compact each layer to a minimum density of 98% Standard Proctor Density except last 300 mm up to sub grade elevation. Compact last 300 mm to a minimum density of 100% standard proctor.

8. Where material consists principally of rock:
    1. Place to full width in layers of sufficient depth to contain maximum sized rocks but in no case is layer thickness to exceed 1 m.
    2. Individual rock fragments not exceeding 150 mm in vertical dimension to be permitted provided their vertical dimension does not exceed one third of fill section depth.
    3. Carefully distribute rock material to fill voids with smaller fragments to form a compact mass.
    4. Fill surface voids at sub grade level with rock spalls or selected material to form an earth tight surface.
    5. Boulders and rock fragments with dimensions exceeding 75 mm not to be placed within 150 mm of pavement sub grade elevation.
9. Construct and compact embankments to an elevation at least 50 nun above design elevations and cut back to design elevations.

15. Proof Rolling

1. Proof rolling, (load testing) of the subgrade and at the surface of the finished granular base course level, prior to asphalt placement shall be conducted on all new and rehabilitated roadways. There shall be representation by the Consultant, Contractor and Owner. Any areas showing deflection shall be rectified as required.
2. The Consultant may authorize use of other acceptable proof rolling equipment. Alternately, use a single axle dual wheeled water truck with a load of 9100 kg on the rear axle or a tandem gravel truck fully loaded to maximum GVW with tires inflated to a minimum of275 kPa.
3. Make sufficient passes with proof vehicle to ensure the surface is subjected to a tire load within 500 mm of any point.
4. Where proof rolling reveals areas of deflection indicating defective sub grade, Consultant shall determine limits of unsuitable sub grade excavation and shall specify replacement material/procedures and/or structure as per the recommendations of a geotechnical engineer.

16. Tolerances

1. The finished surface of the subgrade shall conform to approved grades and shall show no depression more than 15 mm under a straightedge 3.0 m long when placed parallel to the centerline. Sub grade higher than the approved grades shall be cut to the required grades.
2. The tolerance for ditches, boulevards, etc., shall be ±30 mm.

17. Maintenance

1. Maintain road surfaces until next course of material is placed or until project or that portion thereof is accepted.

END OF SECTION

SECTION 02342 – GEOTEXTILES – WOVEN AND NON-WOVEN

PART 1.0 – GENERAL

1. Description

1. This section specifies requirements for supply and installation of woven and non-woven synthetic geotextile material to be used for separation membranes, filter material, placement beneath rip rap, hydraulic filers and drainage systems.

2. Mill Certificates

1. At least one week prior to start of work, furnish the Consultant with copies of mill test data and a certificate that geotextile material delivered to the job site meets the requirements of this Section.

3. Approval

1. Obtain written approval of Consultant for geotextile material before installation of material in the work.

PART 2.0 – PRODUCTS

1. Material

1. Non- Woven
    1. Synthetic fiber: Rot proof, unaffected by action of oil or salt water and not subject to attack by insects or rodents.
    2. Fabric: Non-woven construction supplied in rolls of 3.0 m width, 50 m lengths, minimum thickness of3.0 mm, and minimum weight of280 g/m^2
    3. Seams: Welded or sewn in accordance with manufacturer recommendations.
    4. Physical Properties:
        a. Breaking load and elongation to ASTM 04632 Grab Test Method.
            - Stronger principal direction - 800 N.
            - Weaker principal direction- 800 N.
            - Seam strength - 2,200 kPa.
        b. Mullen burst strength - 2,200 kPa.
        c. Permeability - 1. 1 x 10-2 emfs.
        d. Equivalent opening size (EOS) - ASTM sieve size 0.14 mm.

5. PVC coating (where specified): the protective PVC plastic coating shall be suitable to resist deleterious effects of natural weather exposure, immersion in salt water and shall not show any material difference in its initial compound properties. The coating shall be 048 nun thick

2. Woven

1. Synthetic fiber: Rot proof, unaffected by action of oil or salt water and not subject to attack by insects or rodents.
2. Fabric: Durable, permeable, woven, polypropylene fabric composed of continuous synthetic filaments with typical properties as follows:

Grab tensile strength-ASTN 04632	890N.
Tensile Tear Strength-ASTM 04533	330N.
Mullen Burst Strength-ASTM D3786	2750kPa.
Puncture-ASTM 04833	400N.

Filter fabrics shall be Amoco or Layfield products or approved equivalent.

PART 3.0 – EXECUTION

1. Installation

1. Place material by unrolling on to graded surface, stretch taut and retain in position.
2. Protect fabric from displacement or damage until and during placement of overlaid material layers.
3. Place fabric on sloping surfaces in one continuous length from toe of slope to upper extent of fabric.
4. Overlap each successive strip of fabric 500 mm over previously laid strip.
5. Join successive strips of geotextile as recommended by manufacturer.
6. Protect geotextile material from displacement and damage during placement of granular sub base and/or granular base material.
7. After installation, cover with granular material within two (2) days of placement.
8. Remove and replace fabric damaged or deteriorated as directed by Consultant.

2. Protection

1. Do not permit passage of any vehicle directly on filter fabric at any time

END OF SECTION

SECTION 02371 – RIP-RAP

PART 1.0 – GENERAL

1. Description

1. This Section specifies requirements for supplying and placing rock rip-rap.

PART 2.0 – PRODUCTS

1. Material

1. Stone
    1. Hard, dense, durable stone, free from seams, cracks, or other structural defects, to meet the following size distribution for the use intended
    2. Rip rap sizes should conform to size gradation indicated on drawings.

2. Geotextile Filter
    1. Geotextile: in accordance with Section 02342 - Geotextiles - Non-Woven and Woven.

PART 3.0 – EXECUTION

1. Placing

1. Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.
2. Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
3. Place geotextile on prepared surface in accordance with Section Geotextiles - Non-Woven and Woven and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.
4. Place rip-rap to thickness and details as indicated.
5. Place stones in manner approved by Consultant to secure surface and create a stable mass. Place larger stones at bottom of slopes.
6. Hand Placing:
    1. Use larger stones for lower courses and as headers for subsequent courses.
    2. Stagger vertical joints and fill voids with rock spalls or cobbles.
    3. Finish surface evenly, free of large openings and neat in appearance.

END OF SECTION

SECTION 02563 – MANHOLES AND CATCH BASINS

PART 1.0 – GENERAL

1. Description

1. This Section specifies requirements for supply and installation of manholes, catch basins and sewer appurtenances.

2. Submittals

1. Submittals in accordance with Section 01300.

PART 2.0 – PRODUCTS

1. Materials

1. Cast-in-place concrete:
    1. In accordance with Section 03300 - Cast-in-Place Concrete.
    2. Portland cement to CAN/CSA-A5, Type 50.
    3. Concrete mix design to produce 25 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse-aggregate, with water/cement ratio to CSA-A23.1.
    4. Air entrainment to CSA-A23.1.
    5. Additives: Fly ash to CAN/CSA-A23.5.
2. Concrete reinforcement: in accordance with Section 03200.
3. Precast manhole units: to ASTM C478M, circular. Top sections flat slab top type with opening offset for vertical ladder installation.
4. Precast catch basin sections: to ASTM C478M.
5. Joints as follows:
    1. Sanitary manhole shall have all joints made watertight utilizing rubber gaskets conforming to the requirements of CSA-A257.3 and ASTM C443, preformed bituminous gasket (Rub-R-Nec) or other approved sealant.
    2. Joints between slab top, concrete adjusting rings, and frame shall be made watertight utilizing preformed bituminous gasket (Rub-R-Nec) or other approved sealant.
6. Mortar:
    1. Aggregate: to CAN3 - A82.56
    2. Masonry Cement: to CAN/CSA-A3000-A8, sulphate resistant, Type 50.
7. Ladder rungs: to CAN/CSA-G30.18, No.25M billet steel deformed bars, hot dipped galvanized to CAN/CSA-G164. Rungs to be safety pattern drop step type.
8. Adjusting rings: to ASTIVI C478M.

9. Concrete Brick: to CAN3-Al 65 Series.
10. Drop manhole pipe: to be same as sewer pipe.
11. Frames, gratings, covers to dimensions as indicated and following requirements:
    1. Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
    2. Gray iron castings: to ASTM A48, Class 20.
    3. Ductile iron castings: to ASTM A536, Class 60-40-18.
    4. Castings: sand blasted or cleaned and ground to eliminate surface imperfections and coated with two applications of asphalt varnish.
12. Safety platform - aluminum grates to be MSU (Mississauga) or approved equal.
13. Granular bedding and backfill: in accordance with Section 02701 Aggregates.
14. Concrete mixes and materials: in accordance with Section 03300 Cast-in-Place Concrete.

PART 2.0 – PRODUCTS

1. Excavation and Backfill

1. Excavate and backfill in accordance with Section 02315 Excavating Trenching and Backfilling and as indicated.
2. Obtain approval of Engineer before installing, manholes, catch basins, outfall structures, storm water inlet/outlet structures storm water outlet control structures, or storm water treatment units.

2. Concrete Work

1. Do concrete work in accordance with Section 03300 - Cast-in-Place Concrete.
2. Place concrete reinforcement in accordance with Section 03200 Concrete Reinforcement.
3. Position metal inserts in accordance with dimensions and details as indicated.

3. Installation

1. Construct units in accordance with details indicated, plumb and true to alignment and grade.
2. Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
3. Dewater excavation to approval of Engineer and remove soft and foreign material before placing concrete base.
4. Cast bottom slabs directly on undisturbed ground.

5. Set precast concrete base on a minimum of 150 mm granular bedding to depth specified on Drawing 1.01, compacted to 95% Standard Proctor.
6. Precast units:
    1. Set bottom section of precast units in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight as follows:
        a. Sanitary manholes: with approved rubber ring gaskets or bituminous compound or combination thereof.
        b. Storm manholes and catch basin barrel section joints may be left unparged. Where specified, make storm manholes watertight with approved rubber ring gaskets, bituminous compound, cement mortar or combination thereof.
    2. Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
    3. Plug lifting holes with [precast] concrete plugs set in cement mortar or mastic compound.
7. For sewers:
    1. Place stub outlets and bulkheads at elevations and in positions indicated.
    2. Bench to provide a smooth u-shaped channel. Side height of channel to be 0.5 times full diameter of sewer. Slope adjacent floor at 10:1. Curve channels smoothly. Slope invert to establish sewer grade.
8. Compact granular backfill to 100% Standard Proctor.
9. Place unshrinkable backfill in accordance with Section 02315 - Excavating, Trenching and Backfill.
10. Installing units in existing systems:
    1. Where new unit is to be installed in existing run of pipe, ensure full support of existing pipe during installation. Carefully remove portion of existing pipe to dimensions required and install new unit as specified.
    2. Make joints watertight between new unit and existing pipe.
    3. Where deemed expedient to maintain service around existing pipes and when systems constructed under this Project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.
11. Set frame and cover to required elevation on no more than three concrete rings and no more than one course of brick. Make brick joints and join brick to frame with cement mortar. Parge and make smooth and watertight using bituminous gasket.
12. Place manhole frame and cover on, top section to an elevation 5 mm below finished surface elevation. If adjustment required use concrete ring.

13. Place catch basin frame and cover on top section to an elevation 10 mm below finished surface elevation and 10 mm behind the face of curb.
14. Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from 6intering system.
15. Install safety platforms in manholes having depth of 6 m or greater, as indicated.

4. Adjusting Tops of Existing Units

1. Remove existing grates and frames and store for re-use at locations designated by Engineer.
2. Sectional units:
    1. Raise or lower straight walled sectional units by removing slab top and adding or removing precast sections as required.
    2. Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section with slab top.
    3. When amount of raise is less than 300 mm use standard manhole grade rings.
3. Monolithic units:
    1. Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation for 150 mm or less alteration.
    2. Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
    3. When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
    4. Install additional manhole ladder rungs in adjusted portion of units as required.
    5. Re-use existing gratings and frames.
    6. Re-set gratings and frames to required elevation on no more than three concrete rings and no more than one course of brick. Make brick joints and join brick to frame with cement mortar, parge and trowel smooth.
        a. Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

SECTION 02610 – CORRUGATED STEEL PIPE CULVERTS

PART 1.0 – GENERAL

1. Description

1. This Section specifies requirements for supplying and installing corrugated steel pipe culverts

2. Related Work

1. Section 02315 - Trench Excavation, Backfill, and Compaction

PART 2.0 – PRODUCTS

1. Corrugated Steel Pipe

1. Corrugated steel pipe (CSP) and structural plate corrugated steel pipe (SPCSP) to CSA G-401.
2. Provide watertight cut-off collars as indicated.
3. Prefabricated end sections as indicated.

PART 3.0 – EXECUTION

2. Trenching, Bedding, and Backfill

1. Do trenching, bedding, and backfill work to Section 02315.
2. Trench line and grade as established by Engineer.
3. Do not backfill until pipe grade and alignment is inspected by Engineer.

3. Laying Corrugated Steel Pipe Culverts

1. Commence pipe placing at downstream end.
2. Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.
3. Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
4. Do not allow water to flow through pipes during construction except as permitted by Engineer.

4. Joints

1. Corrugated Steel Pipe
    1. Match corrugations or indentations of coupler with pipe sections before tightening.
    2. Tap couplers firmly as they are being tightened to take up slack and ensure a snug fit.
    3. Insert and tighten bolts.

2. Structural Plate
    1. Erect in final position by connecting plates with bolts at longitudinal and circumferential seams.
    2. Drift pins may be used to facilitate matching of holes.
3. Place plates in sequence recommended by manufacturer with joints staggered so that not more than three plates come together at any one point.
4. Draw bolts up tight, without overstress, before beginning backfill.
5. Repair spots where damage has occurred to spelter coating by applying two coats of approved asphalt paint or two coats of zinc rich epoxy paint.

END OF SECTION

SECTION 02701 – AGGREGATES - GENERAL

PART 1.0 – GENERAL

1. Description

1. This Section specifies general requirements for supplying and processing of aggregates to be stockpiled or incorporated into work. Specific requirements for physical properties of aggregates are given in related work sections.

2. Source Approval

1. Source of materials to be incorporated into work or stockpiled requires approval.
2. Inform Engineer of proposed source of aggregates and provide access for sampling at least two weeks prior to commencing production.
3. If, in opinion of Engineer, materials from proposed source do not meet or cannot reasonably be processed to meet specified requirements, procure an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
4. Should a change of material source be proposed during work, advise Engineer two weeks in advance of proposed change to allow sampling and testing.
5. Acceptance of a material at source does not preclude future rejection if it is subsequently found to lack uniformity or if it fails to conform to requirements specified or if its field performance is found to be unsatisfactory.

3. Production Sampling

1. Aggregate will be subject to continual sampling during production.
2. Provide Engineer with ready access to source and processed material for purpose of sampling and testing.
3. Bear the cost of sampling and testing of aggregates in order to meet design gradations and specifications.

PART 2.0 – PRODUCTS

1. General

1. Aggregate shall be sound, hard, durable material free from soft, thin, elongated, or laminated particles, organic material, or other deleterious substances.
2. Flat and elongated particles are those whose greatest dimension exceeds five times their least dimension.
3. Fine aggregates satisfying requirements of applicable section shall be one, or a blend of following:

1. Natural sand.
2. Manufactured sand and/or fines.
3. Screenings produced in crushing of quarried rock, boulders, gravel or slag.
4. Coarse aggregates satisfying requirements of applicable section shall be one of following:
    a. Crushed rock or slag.
    b. Gravel composed of naturally formed particles of stone.

2. Materials

1. Gradation: To be within the limits and for the types of materials specified in Table A appended to this Section, when tested to ASTM C1 17 and ASTM C1 36, and having a smooth curve without sharp breaks when plotted on a semi-log grading chart to ASTM El 1.
2. Production of Manufactured Fines: Manufactured fines are defined as that portion of the material passing the 5,000 sieve size which is produced by the crushing process. In the event the manufactured fines in the total combined aggregate do not meet the requirement for the specified Asphaltic Concrete Mix, extra manufactured fines shall be produced by screening the pitrun material so that the screened material contains no more than 5% material passing a 5,000 sieve. This screened material shall then be crushed so that 100% passes the 10,000 sieve and. a minimum of 95% passes the 5,000 sieve. All material produced by this crushing process-shall be placed in a separate stockpile and designated as manufactured fines.
3. Moisture Content: <u>As specified in specific sections.</u>

PART 3.0 – EXECUTION

1. Processing

1. Process aggregate uniformly using methods that prevent contamination, segregation, and degradation.
2. Split and combine aggregates if required to obtain gradation requirements specified. Use approved methods and equipment. Do not blend in stockpiles.
3. Blending to increase percentage of crushed particles or decrease percentage of flat and elongated particles is permitted.
4. Wash aggregates, if required to meet specifications. Use only equipment approved by Engineer.

2. Handling

1. Handle and transport aggregates to avoid segregation, contamination and degradation.

3. Stockpiling

1. Stockpile aggregates on site in locations indicated or designated. Do not stockpile on completed pavement surfaces where damage to pavement may result.
2. Stockpile aggregates in sufficient quantities to meet project schedules.
3. Stockpiling sites shall be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials.
4. Except where stockpiled on acceptably stabilized areas, provide a compacted sand base not less than 300 mm in depth to prevent contamination of the aggregate or, if permitted, stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into work.
5. Separate aggregates by substantial dividers or stockpile far enough apart to prevent intermixing.
6. Reject intermixed or contaminated materials. Remove and dispose of rejected materials as directed within 48 hours of rejection.
7. Stockpile materials in uniform layers of thickness as follows:
    1. Max 1 m for coarse aggregate and base course materials.
    2. Max 2 m for fine aggregate and subbase materials.
    3. Max 1.5 m for other materials.
8. Complete each layer over entire stockpile area before beginning next layer.
9. Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
10. Coning of piles or spilling of material over edges of pile will not be permitted. Stacking conveyors will not be permitted for stockpiling road base and graded seal coat aggregates.
11. During winter operations prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

4. Stockpile Cleanup

1. Leave stockpile site in a tidy, well drained condition, free of standing surface water.
2. Remove any unused aggregates as directed.

END OF SECTION

SECTION 02911 – TOPSOIL PLACEMENT AND FINISH GRADING

PART 1.0 – GENERAL

1. Description

1. This Section specifies requirements for final site grading for topsoil placement, and covers the supply, placement, modification, and preparation of topsoil.

2. Site Conditions

1. Known underground and surface utility lines and buried objects are indicated on the Drawings. Contractor to verify locations prior to starting Work.

3. Protection

1. Prevent damage to existing trees, roots, fencing, landscaping, natural features, bench marks, existing buildings, existing pavement, surface or underground utility lines which are to remain. Make good any damage.
2. Protect existing trees and shrubs.

4. Samples and Testing

1. Topsoil must be approved for use in the Work by Engineer.
2. Supply to the Engineer, four weeks prior to start of topsoil placement, a one-litre sample of topsoil to be used in the Work.
3. Subject to the results of soil testing, the Engineer may make recommendations for modifications to the soil to make it acceptable for use in the Work. Any modifications or additives required will be considered incidental to the Work.
4. When source of such topsoil is exhausted, topsoil from a new source shall not be used until tested and approved by the Engineer.

PART 2.0 – Products

1. Materials

1. Topsoil: A fine friable medium loam, capable of sustaining good agricultural growth, meeting accepted horticultural practices and approved by Engineer. Topsoil shall meet the following requirements:
    1. Contain a minimum 4% organic matter for clay loams and minimum 2% for sandy loams.
    2. Acidity range pH of 6.0 to 7.8.

3. Free of subsoil, roots, vegetation, weed seeds, stones larger than 50 mm in greatest dimension, or any other extraneous material.
4. Topsoil containing noxious weeds is not acceptable.

2. Herbicide: "Round-Up" or other approved chemical base glysophate equal.

PART 3.0 – Execution

1. Preparation

1. Apply herbicide 10 days in advance of grading to kill existing weeds and grasses on-site, if required by the Engineer.
2. Fine grade subgrade, within 50 mm of design rough grade.
3. Fine grade subgrade, eliminating uneven areas and low spots. Remove debris, roots, branches, stones in excess of 50 mm diameter, and building materials. Remove subsoil that has been contaminated with oil or gasoline.

2. Spreading Topsoil

1. Spread dry topsoil during dry weather over approved, dry unfrozen subgrade, where indicated.
2. Bring topsoil up to finished grade.
3. Apply topsoil to 150 mm minimum depth after settlement.
4. Manually spread topsoil around existing trees and plants to prevent damage by grading equipment.
5. Care must be taken not to raise existing soil levels within drip line of plant material.
6. Scarify to a depth of 225 mm to break up lower horizons without substantial mixture of topsoil.
7. Apply 10-47-0 or equivalent fertilizer at a rate of 450 kg/ha.
8. Prepare loose friable seed bed by means of rototilling to a depth of 150 mm.
9. Dispose of debris.
10. Level surface to final design grades within a tolerance of 25 mm and ensure positive drainage.
11. Ensure that the topsoil is properly blended into the adjacent property.

END OF SECTION

SECTION 02921 – SEEDING

PART 1.0 – GENERAL

1. Description

1. This Section specifies requirements for supplying and sowing grass seeds.

PART 2.0 – Products

1. Grass Seed

1. Fine Grass Mixture: Canada "Certified" seed, "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada Seeds Act and Seeds Regulations, according to the following grass seed mixture:

    35% Kentucky Blue Grass Species
    60% Creeping Red Fescue
    5% Perennial Rye

2. Coarse Grass Mixture: Canada "Certified" seed, "Canada No. 1 Ground Cover Mixture" in accordance with Government of Canada Seeds Act and Seeds Regulations, as specified by the Engineer.
3. Supply in packages individually labelled in accordance with Seeds Regulations and indicating name of supplier and date bagged.

2. Water

1. Free of impurities that would inhibit germination and growth.
2. Supplied by Owner at designated source.

PART 3.0 – Execution

1. Workmanship

1. Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
2. Remove and dispose of weeds, debris, stones 50 mm in diameter and larger, soil contaminated by oil, gasoline, and other deleterious materials.

2. Seed Bed Preparation

1. Verify that grades are correct. If discrepancies occur, notify Engineer and do not commence Work until instructed by Engineer.
2. Fine grade surface free of humps and hollows to smooth, even grade, to elevations indicated to tolerance of plus or minus 25 mm.
3. Surface drainage is to be as shown on the site grading plan.

3. Seed Placement

1. For mechanical seeding:
    1. Use "Brillion" type mechanical landscape seeder with sand discs which accurately places seeds at specified depth and rate and rolls in single operation.
    2. Use equipment and method acceptable to Engineer.
2. For manual seeding:
    1. Use "Cyclone" type manually operated seeder.
    2. Rake surface to ensure seed is properly embedded.
    3. Remove any topsoil lumps in excess of 50 mm in size.
    4. Use equipment and method acceptable to Engineer.
3. On cultivated surfaces, uniformly sow fine grass seed at rate of 170 kg/ha and coarse grass seed at rate of 75 kg/ha.
4. Blend applications 150 to 300 mm into adjacent grass areas and previous applications to form uniform surfaces.
5. Sow half of required amount of seed in one direction and remainder at right angles.
6. Embed seed into soil to depth of 6 to 10 mm. Not less than 85% of seed to be placed at specified depth and covered by soil.
7. Consolidate mechanically seeded areas by rolling area if soil conditions warrant, or if directed by Engineer, with equipment approved by Engineer immediately after seeding.
8. Consolidate manually seeded areas by rolling area with equipment approved by Engineer immediately after seeding.
9. Protect seeded areas against -damage. Remove protection material after lawn areas have been established and accepted by Engineer.

4. Acceptance for Issue of Construction Completion Certificate

1. Seeded areas will be accepted by Engineer provided that:
    1. Areas are uniformly graded and seeded to Clauses 3.1, 3.2, and 3.3 of this Section.
    2. Areas are free of perennial weeds, rocks, and debris.

2. Deficiencies to be corrected prior to issuance of the Construction Completion Certificate.

5. Maintenance During Warranty Period

1. From the issue date of the Construction Completion Certificate to the end of the one year warranty period, perform the following maintenance operations:
    1. Repair and reseed dead or bare spots, repair rutting, and areas of settlement to satisfaction of Engineer.
    2. Repaired areas must be cut at least three times and seed must be fully established before area will be accepted.
    3. Cut grass to 50 mm whenever it reaches height of 100 mm.
    4. Eliminate weeds by mechanical means.

END OF SECTION

SECTION 02924 – HYDROSEEDING

PART 1.0 – GENERAL

1. References

1. Provide hydroseeding in accordance with the following standards (latest revision) except where specified otherwise.
2. Government of Canada
    1. Seeds Act and Seeds Regulations
    2. Fertilizers Act and Fertilizers Regulations
3. Government of Alberta
    1. Weed Control Act and Weed Regulation.

2. Submittals

1. Provide the following submittals.
2. The following test results at least 15 days prior to the delivery of seeds to the Site.
    1. Certificate of Analysis for each seed supplied with test results showing:
        - germination rate, or when native seeds are specified and are not a part of the seed tables, the Tetrazolium results, and
        - purity.
    2. Seed mix composition expressed as a percentage of each seed species by dry mass for each seed mix specified.

3. Delivery, Storage and Handling

1. Provide seed in standard containers clearly labelled with the following information:
    1. Supplier's name and address.
    2. Lot number.
    3. Net mass.
    4. Mixture Composition: Names and percentages of individual seed species.
2. Protect seed from direct sunlight, moisture, mould, and other detrimental conditions, while in transit and storage.
3. Provide fertilizer in standard containers clearly labelled with the following information:
    1. Supplier's name and address.
    2. Specified composition.
    3. Net mass.

PART 2.0 – Products

1. Materials

1. Provide materials in accordance with the following.
2. Seed Mix Composition:
    1. . Common No. 1 Grade seeds in accordance with the Government of Canada Seeds Act and Seeds Regulations. Supply seed mixed by a conditioner and bulk storage facility approved by the authority responsible for Canada Seeds Act & Regulations. All seed shall be tested by a Registered Seed Lab.
    2. Seeds and seed mixtures subjected to moisture, mould, and detrimental conditions will not be accepted by the Consultant.
    3. Agronomic Composition: Seed Mix Composition per Zone 3 as shown in the following schedule titled Agronomic Seed Mix.

Agronomic Seed Mix

Common Name	Latin Name	Seed Mix – Percentage by Dry Weight
		Zone 3
Pubescent Wheat Grass	Agropyron trichophorum	40%
Dahurian Wildrye	Elymus dahuricus	22%
Sheep Fescue	Festuca ovina	30%
Perennial Ryegrass	Lolium perenne	8%

    4. Cover Crop: Add agronomic seed Common No. 1 Grade to the Seed Mix Composition specified in the schedule titled Agronomic Seed Mix. Add cover crop seed using a seed variety selected by the Contractor, when seeding is performed after September 15 of any year, or a later date if acceptable to the Consultant.
3. Fertilizers:
    1. Do not apply fertilizers where native seed mixes are applied.
    2. In accordance with the Canada Fertilizers Act and Fertilizers Regulations.
    3. Compatible with the seed mix composition and soil conditions.
    4. Composition: Nitrogen 16, Phosphates 20, Potash 0
4. Water: Free of impurities that would inhibit or adversely affect germination and growth of the seed.
5. Hydro-mulch: Wood or wood cellulose fibre mulch, 100% biodegradable, compatable with the environment, free of growth and germination inhibiting factors, free of weeds, and free of other deleterious matter.

6. Tackifier: A polymer or resin tackifier, for use with the mulch, capable of joining the mulch particles together and securing the mulch to the ground.
7. Hydro-mulch and tackifier shall not form an impervious seal that prevents moisture from reaching the underlying soil.
8. Equipment: Hydraulic seeding equipment including slurry tank, agitation system, pumps, hoses, and nozzles.

PART 3.0 – Execution

1. Preparation

1. Prepare areas for hydroseeding by slope texturing as specified in Section – 02910.
2. Provide prepared surfaces that are free of frost and standing water.

2. Notification of Commencement of Work

1. Notify the Consultant at least 48 hours prior to any seeding Work. Do not commence seeding operations until all areas designated for seeding have been prepared to the satisfaction of the Consultant.
2. Do not commence seeding operations until the Consultant has reviewed the Certificate of Seed Analysis and verified the specified seed mix composition supplied.

3. Weather Conditions

1. Do not proceed with the work when, in the opinion of the Consultant, weather conditions are unsuitable. The Consultant will not allow work to proceed when wind conditions are such that material is being carried beyond the designated work areas or that the material is not being uniformly applied. Use equipment and method acceptable to Engineer.

4. Application

1. Hydroseed the areas specified in the Contract Documents or as directed by the Consultant.
2. Measure the quantities of seeding materials by weight.
3. Apply the following at the rates specified:
    1. Hydroseed mix composition at a rate of 75 kg/hectare.
    2. Hydro-mulch at a rate recommended by the manufacturer, and the tackifier at a rate recommended by the manufacturer.
    3. Fertilizer composition at a rate of 150kg/hectare.
    4. Cover crop seed at a rate of 5 kg/hectare.

4. Apply the seeding materials during calm weather.
5. Add the seeding materials, using the proper sequence, into the hydraulic seeder under continuous agitation to produce a thoroughly mixed slurry.
6. Apply the slurry uniformly with non-fluctuating pump pressure, and at the optimum angle for adherence to surfaces and germination of seed.
7. When a fertilizer composition is required in the Contract Documents, apply it uniformly.
8. Where the seeding adjoins existing vegetation, overlap the slurry application at least 300 mm into adjacent vegetated areas.
9. Do not seed on hardened, crusted or rutted soil.
10. Protect seeded areas against erosion or damage.

5. Protection

1. Take reasonable care to prevent the contamination of structures, signs, guardrails, fences, utilities, and other installations from the seeding operations. Remove offending contamination using methods acceptable to the Consultant.
2. Ensure seeding does not dislodge soil or cause erosion.
3. Protect existing work, and the Work of the Contract, and repair any damage to such Work.

6. Watering

1. Water the seeded areas after seeding to achieve germination and a uniform stand of grass
2. Apply water uniformly to seeded areas without causing displacement or erosion of the materials and soil.
3. Minimize travel on seeded surfaces.
4. Use watering equipment and techniques authorized by the Consultant.

7. Reseeding

1. At locations that fail to show a uniform stand of grass for any reason during the calendar year following the year of initial seeding, repair the defective locations as determined by the Consultant. A uniform stand of grass will be considered growth that shows no deterioration or exposed soil greater than 1 square metre in size, and provides a minimum of 80 percent ground cover as determined by the Consultant.
2. The Consultant will inspect the seeding during the month of May of the calendar year following the year of initial seeding. Complete any required reseeding work prior to June 15 of that year. This date will be extended if, in the opinion of the Consultant, the weather conditions prior to June 15 are not suitable for reseeding Work.

3. Meet all the requirements for initial seeding, including seeding method, seed and fertilizer compositions and application rates, and slope texturing as applicable.
4. The Contractor will not be required to reseed any area more than once.

END OF SECTION

APPENDIX A - GEOTECHNICAL REPORT

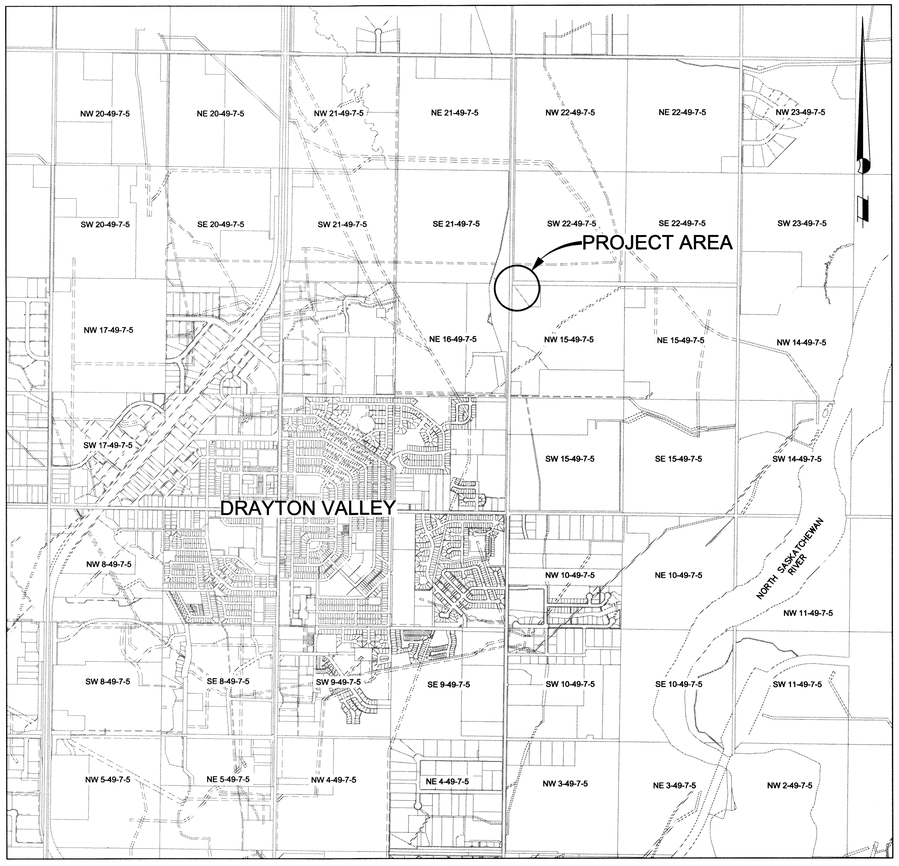
ISSUED FOR TENDER DRAWINGS FOR:

TOWN OF DRAYTON VALLEY

SLOPE AND DRAINAGE REHABILITATION
in
NE 16-49-7-5
ROADWAY PLAN 1099 LZ
TOWN OF DRAYTON VALLEY

336-000
JUNE 2018

SENON ENGINEERING INC.



KEY PLAN

DRAWING NO.	REV	DRAWING LIST
COV	1	COVER SHEET
EC	1	EXISTING CONDITIONS
SP	1	SITE PLAN
PP1	1	ROADWAY AND DITCHES PLAN AND PROFILE STA 5+010 TO STA 5+097(ROAD) STA 10+000 TO STA 10+026 (DITCH/BERM)
PP2	1	CHANNEL PLAN AND PROFILE – STA 0+000 TO STA 0+110
XS1	1	ROADWAY AND DITCHES CROSS SECTIONS STA 5+010 TO STA 5+097
XS2	1	CHANNEL SECTIONS STA 0+000 TO STA 0+085
DET	1	DETAILS

NO	DATE	REVISION	BY	APP
1	06/04/18	ISSUED FOR TENDER	GF	
0	05/29/18	ISSUED FOR REVIEW	GF	

PROFESSIONAL ENGINEER J. FITZNER ALBERTA
JUNE 4 '18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

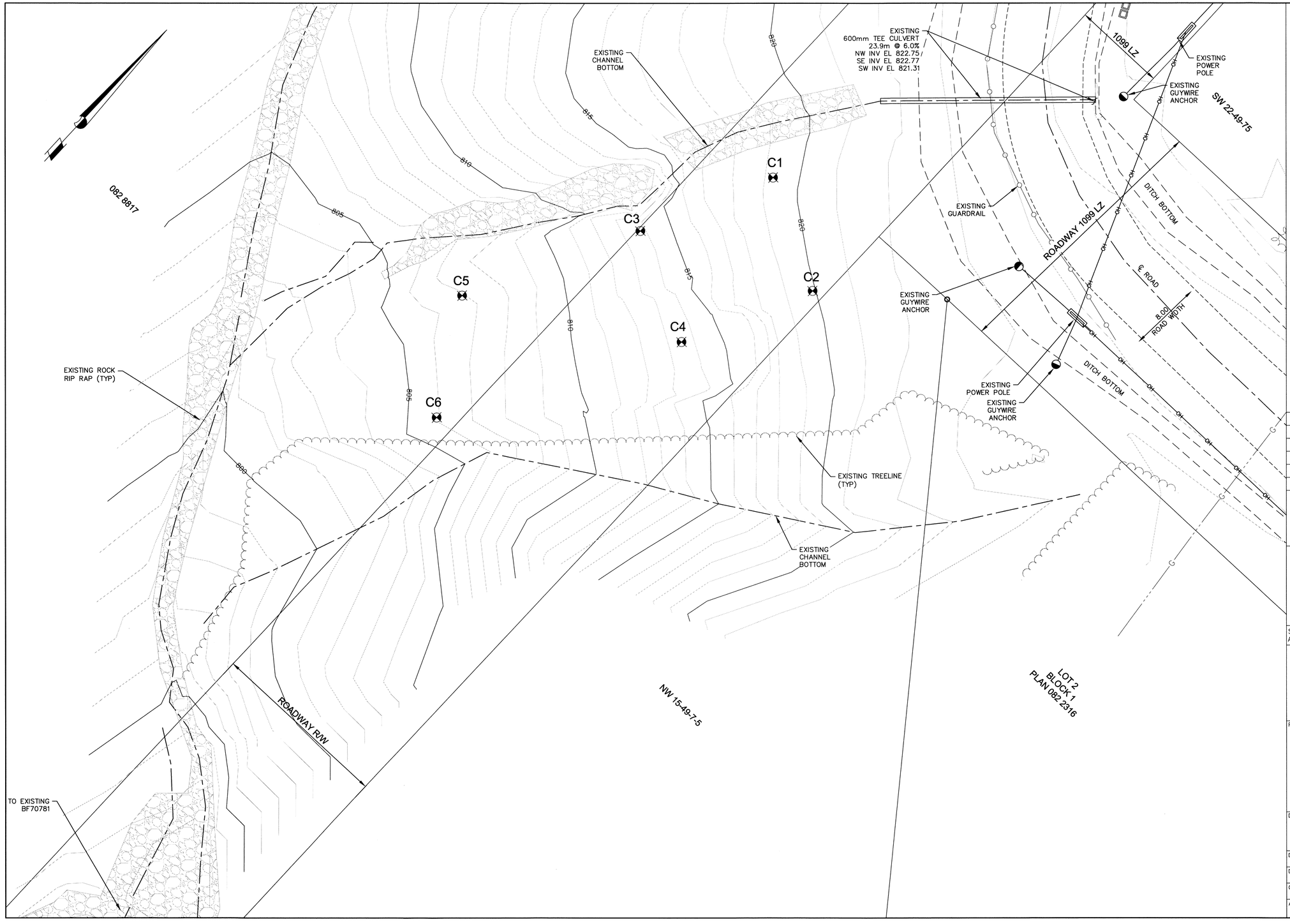
PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT
SLOPE AND DRAINAGE REHABILITATION
in
NE 16-49-7-5
ROADWAY PLAN 1099 LZ
TOWN OF DRAYTON VALLEY

DRAWING
COVER SHEET

DESIGN JH	DATE 05/29/18	SCALE NTS
DRAWN JH	PROJECT NO. 336-000	
CHECKED GF	DRAWING NO COV	REV 1
APPROVED		



LEGEND

5.0m MAJOR ORIGINAL GROUND CONTOURS — 820

1.0m MINOR ORIGINAL GROUND CONTOURS

FOUND IRON PIN (FIP)

TESTHOLE

NOTES

- ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
- DRAWING TO SCALE ON FULL SIZE (22" x 34") SHEET ONLY.
- ORIGINAL GROUND TOPOGRAPHIC SURVEY IS METRIC AND GEODETIC IN 3TM COORDINATES FIP, N-5900707.650, E-63557.738, EL 822.506m

NO	DATE	REVISION	BY	APP
1	06/04/18	ISSUED FOR TENDER	GF	
0	05/29/18	ISSUED FOR REVIEW	GF	

PROFESSIONAL ENGINEER G.FITZNER ALBERTA — JUNE 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

TOWN OF DRAYTON VALLEY — PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING

EXISTING CONDITIONS

DESIGN JH	DATE 05/29/18	SCALE 1:200
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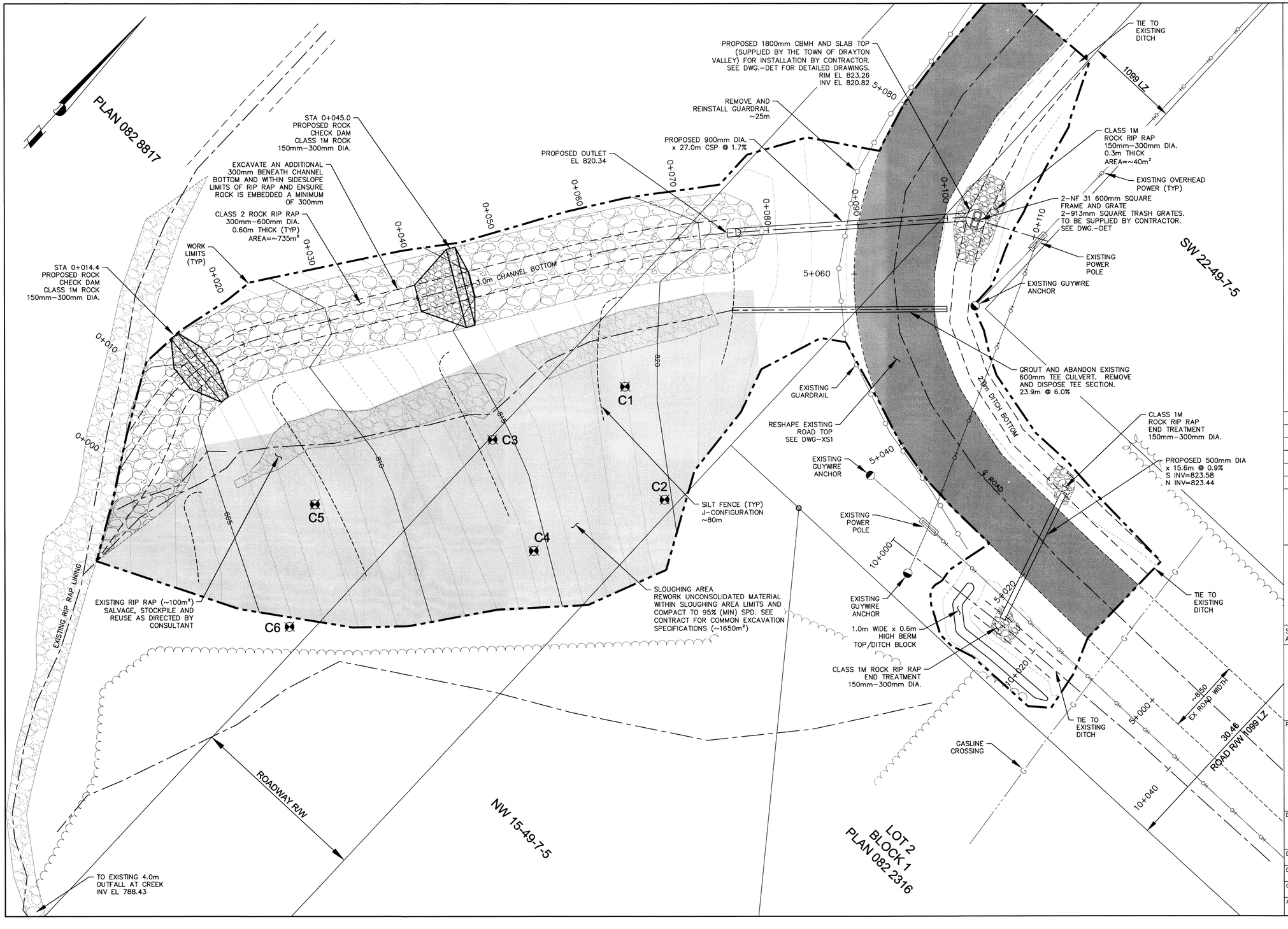
CHECKED GF	DRAWING NO EC	REV 1
APPROVED		



LEGEND

- 5.0m MAJOR DESIGN CONTOURS — 820
- 1.0m MINOR DESIGN CONTOURS
- EXISTING ROAD SHOULDER
- TESTHOLE

NOTES

- RIP RAP ARMOURING TO BE INSTALLED AS PER ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL – BMP #14 RIP RAP ARMOURING
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0	05/29/18	ISSUED FOR REVIEW	GF	

PROFESSIONAL ENGINEER G. FITZNER ALBERTA
June 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

TOWN OF DRAYTON VALLEY PULLING TOGETHER

SENON ENGINEERING INC.

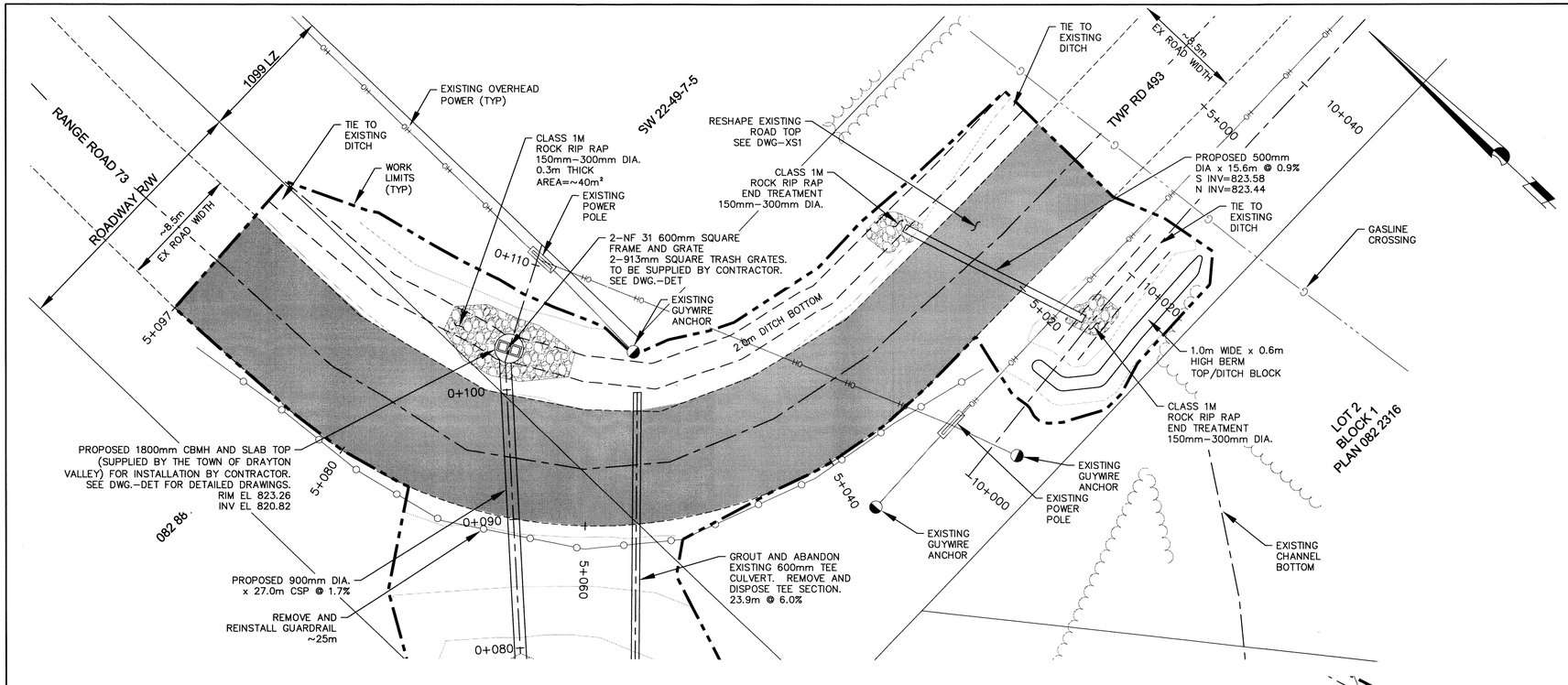
PROJECT

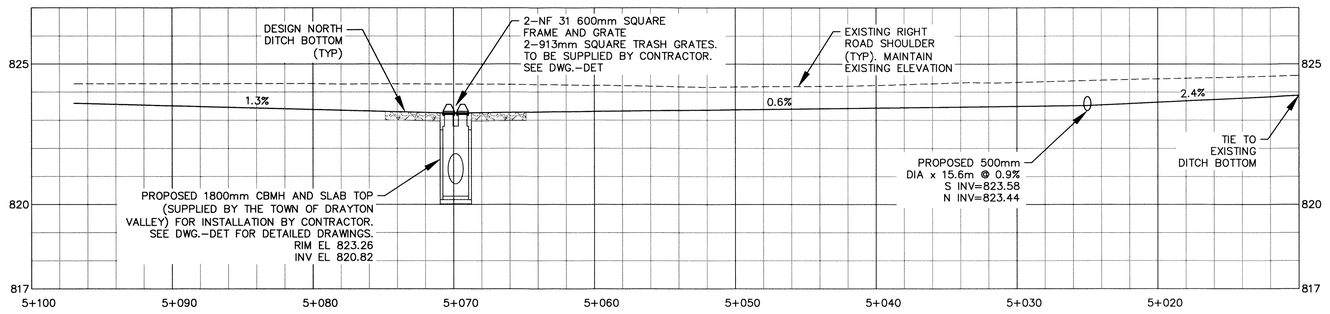
SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

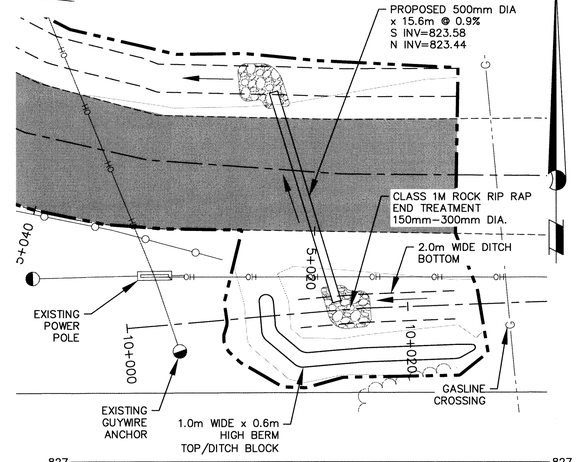
DRAWING

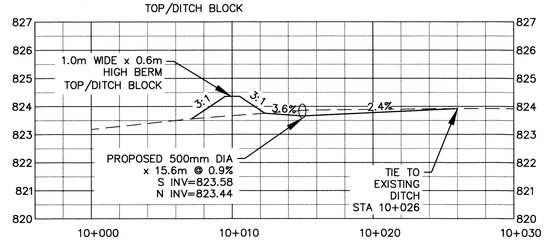
SITE PLAN

DESIGN JH	DATE 05/29/18	SCALE 1: 200	
DRAWN JH	PROJECT NO. 336–000		
CHECKED GF	DRAWING NO. SP	REV 1	
APPROVED			









LEGEND

5.0m MAJOR DESIGN GROUND CONTOURS — 820

1.0m MINOR DESIGN GROUND CONTOURS

EXISTING ROAD SHOULDER

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0	05/29/18	ISSUED FOR REVIEW	GF	RF

PROFESSIONAL ENGINEER G. FITZNER ALBERTA
June 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

TOWN OF DRAYTON VALLEY PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING: ROADWAY AND DITCHES PLAN AND PROFILE STA 5+010 TO STA 5+097(ROAD) STA 10+000 TO STA 10+026 (DITCH/BERM)

DESIGN JH	DATE 05/29/18	SCALE H 1:200 V 1:100
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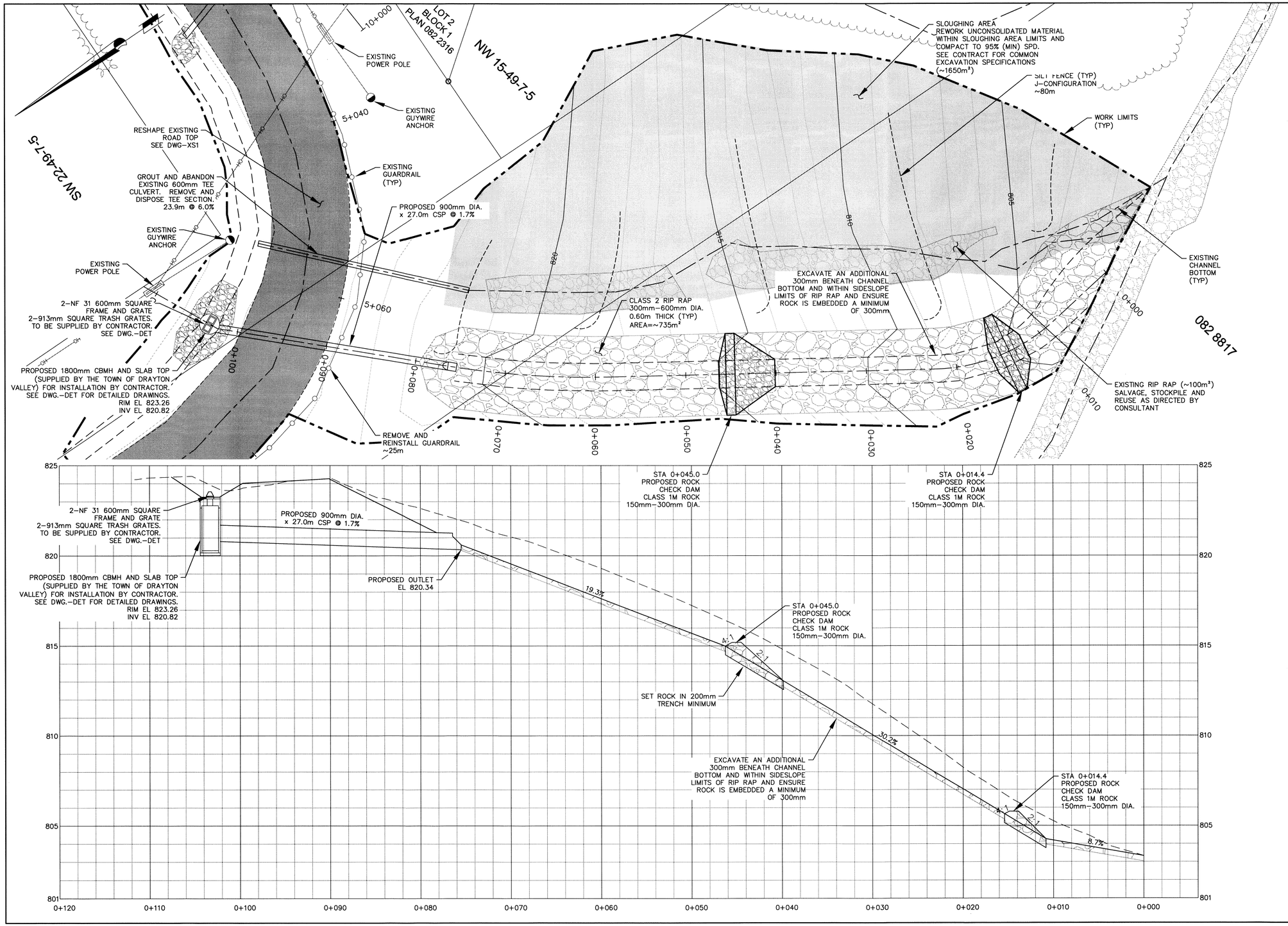
CHECKED GF	DRAWING NO PP1	REV 1
APPROVED		



LEGEND

5.0m MAJOR DESIGN GROUND CONTOURS — 820

1.0m MINOR DESIGN GROUND CONTOURS

EXISTING ROAD SHOULDER

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0	05/29/18	ISSUED FOR REVIEW	GF	

PROFESSIONAL ENGINEER G. FITZNER ALBERTA
JUNE 4/18

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TOWN OF DRAYTON VALLEY PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING

CHANNEL PLAN AND PROFILE STA 0+000 TO STA 0+110

DESIGN JH	DATE 05/29/18	SCALE H 1:200 V 1:100
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CHECKED GF	DRAWING NO PP2	REV 1
APPROVED		

SOUTH

NORTH

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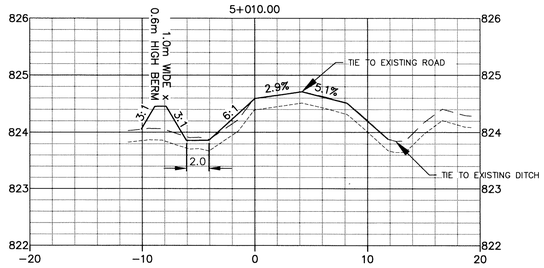

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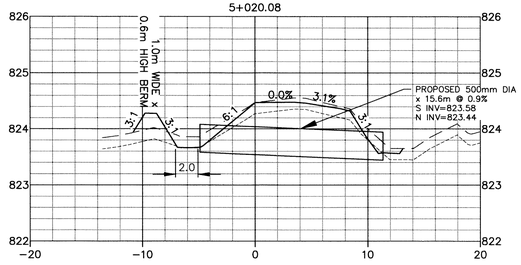

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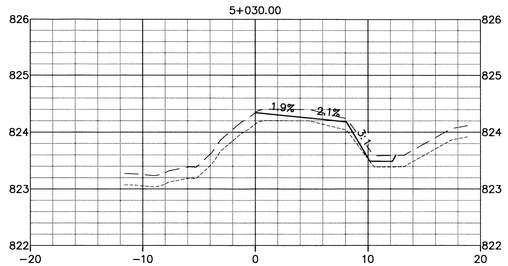

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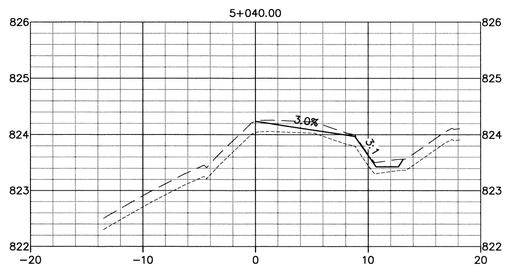

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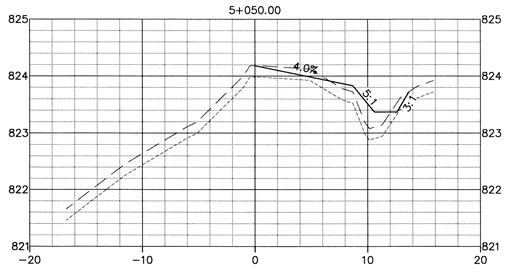

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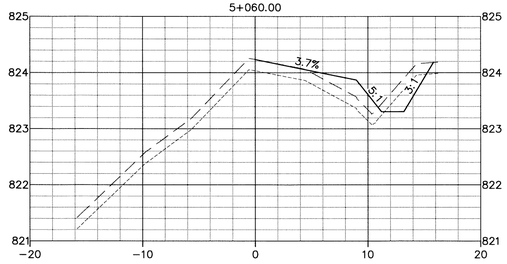

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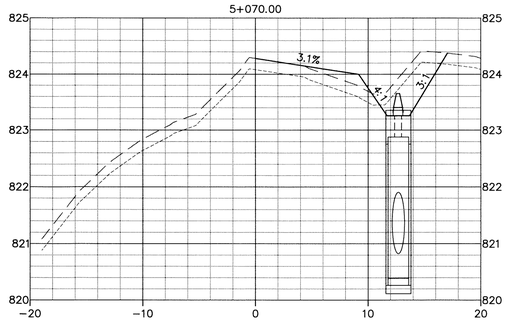

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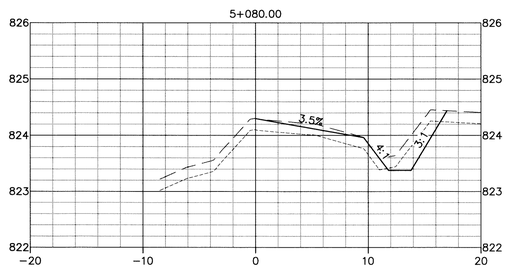

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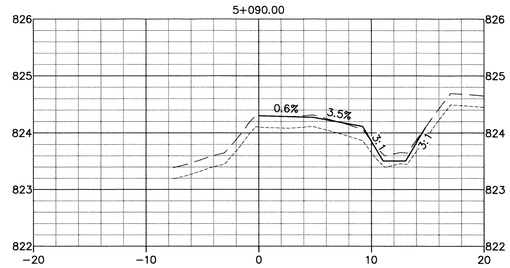

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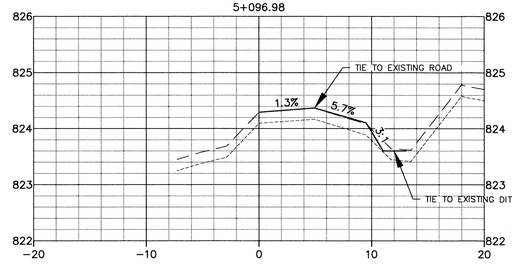

LEGEND

ORIGINAL GROUND

STRIPPING

DESIGN GROUND

NOTES

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- DRAWING TO SCALE ON FULL SIZE (22" x 34") SHEET ONLY.

NO	DATE	REVISION	BY	APP
1	06/04/18	ISSUED FOR TENDER	GF	
0	05/29/18	ISSUED FOR REVIEW	GF	RF

PROFESSIONAL ENGINEER G. FITZNER ALBERTA

JUNE 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING

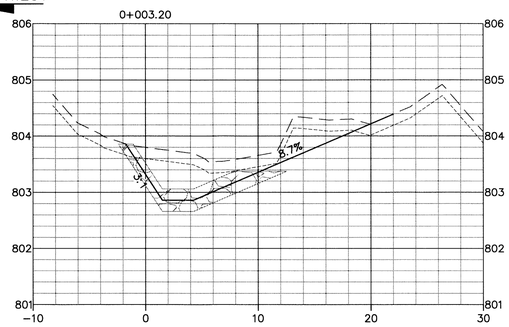
ROADWAY AND DITCHES CROSS SECTIONS STA 5+010 TO STA 5+097

DESIGN JH	DATE 05/29/18	SCALE H 1:250 V 1:50
DRAWN JH	PROJECT NO 336-000	
CHECKED GF	DRAWING NO XS1	REV 1
APPROVED		

NORTHWEST

SOUTHEAST

0+003.20



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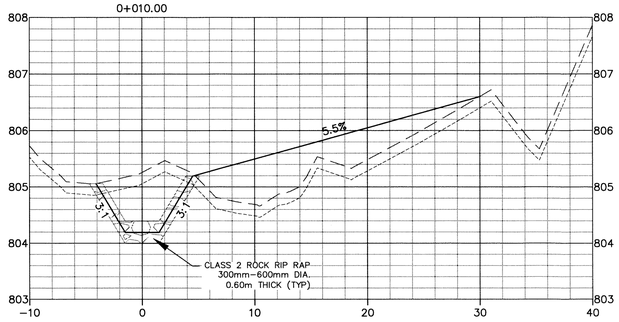

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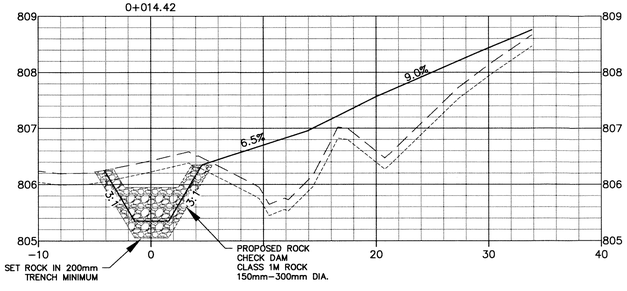

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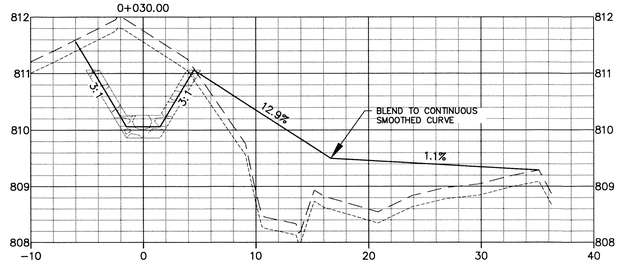

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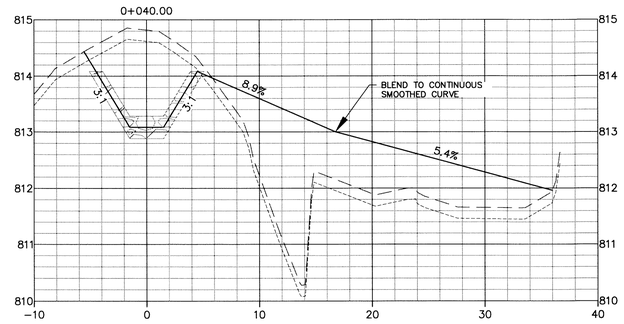

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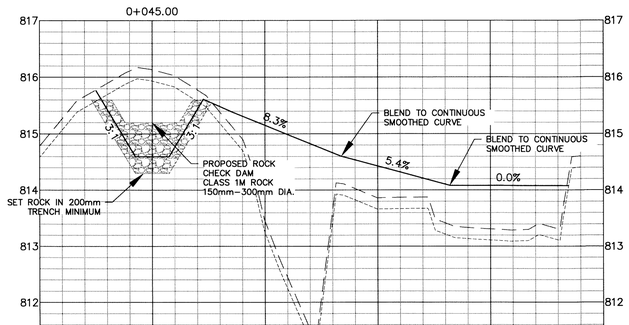

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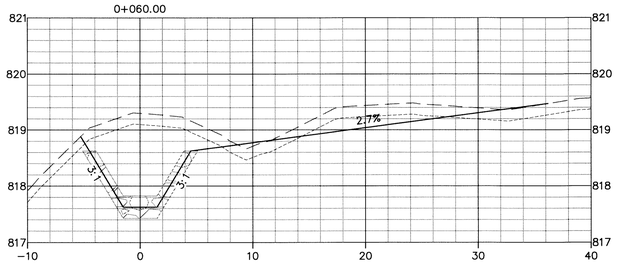

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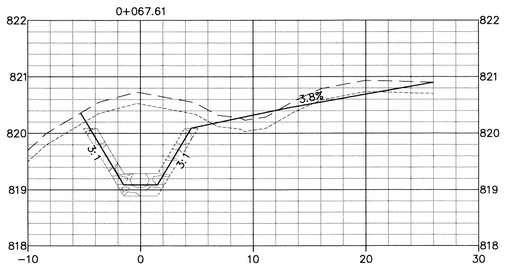

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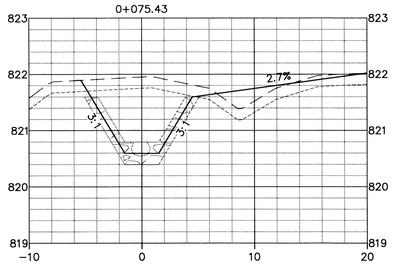

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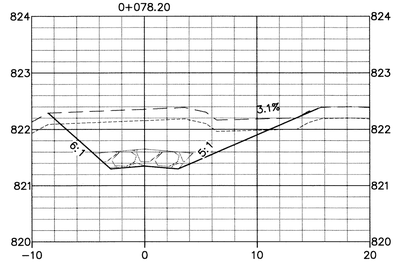

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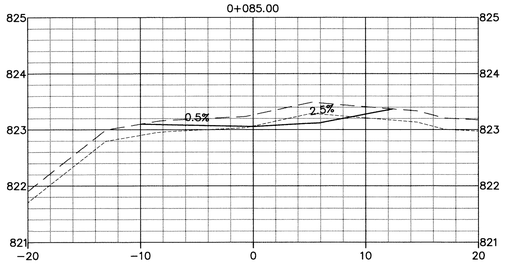

LEGEND

ORIGINAL GROUND

STRIPPING

DESIGN GROUND

NOTES

- RIP RAP ARMOURING TO BE INSTALLED AS PER ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL – BMP #14 RIP RAP ARMOURING
- TOPSOIL TO BE PLACED PRIOR TO HYDROSEEDING AND INSTALLING ROLLED EROSION CONTROL PRODUCTS AND APPLIED AS PER ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL – BMP #25 TOPSOILING.
- HYDROSEEDING TO BE APPLIED AS PER ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL – BMP #24A HYDROSEEDING.
- SILT FENCE TO BE INSTALLED AS PER ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL – BMP #1 SILT FENCE (FILTER FENCE)
- SUPPLY AND INSTALL NON-WOVEN GEOTEXTILE FILTER FABRIC TO CHANNEL AND UNDER RIP RAP IN VICINITY OF PROPOSED CATCHBASIN MANHOLE.
- SUPPLY AND INSTALL S75® SINGLE NET STRAW BLANKET OR EQUIVALENT TO ALL NEWLY CONSTRUCTED DITCHES AS SPECIFIED BY MANUFACTURER.
- ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
- DRAWING TO SCALE ON FULL SIZE (22" x 34") SHEET ONLY.

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0	05/29/18	ISSUED FOR REVIEW	GF	RF

PROFESSIONAL ENGINEER G. FITZNER ALBERTA
June 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

PULLING TOGETHER

SENON ENGINEERING INC.

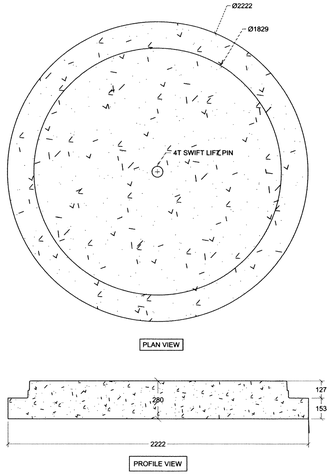
PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING

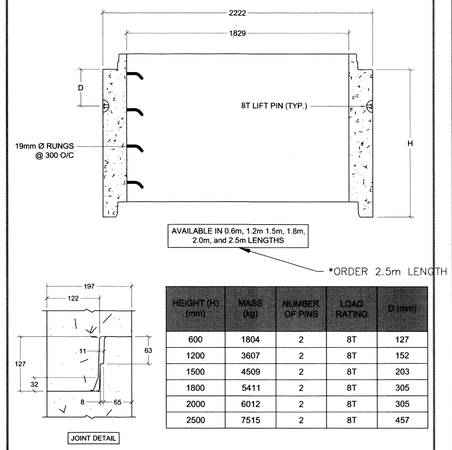
CHANNEL SECTIONS STA 0+003.2 TO STA 0+085

DESIGN JH	DATE 05/29/18	SCALE H 1:250 V 1:50
DRAWN JH	PROJECT NO 336-000	
CHECKED GF	DRAWING NO XS2	REV 1
APPROVED		



DRAWN BY:	NJM PHAM	1600mm MANHOLE BASE	INLAND Pipe
SCALE:	NTS		
DATE:	NOVEMBER 25, 2015	DIMENSIONS IN mm APPROX MASS: 2405 kg	
DRAWING #:	1800mm MH BASE		
REVISION #:	REV. 1		
CHECKED BY:	TYSON DYCK		

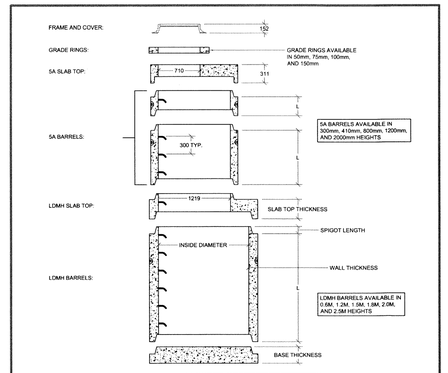
7136 11th AVE NW, CALGARY, AB
PH: 403.279.8521 FAX: 403.279.7643



HEIGHT (H) (mm)	MASS (kg)	NUMBER OF PINS	LOAD RATING	D (mm)
600	1804	2	8T	127
1200	3607	2	8T	152
1500	4509	2	8T	203
1800	5411	2	8T	305
2000	6012	2	8T	305
2500	7515	2	8T	457

DRAWN BY:	SAM HAN	1800mm MANHOLE RISER	INLAND Pipe
SCALE:	NTS		
DATE:	NOVEMBER 12, 2015	DIMENSIONS IN mm	
DRAWING #:	1800mm MH RISER		
REVISION #:	REV. 1		
CHECKED BY:	TYSON DYCK		

7136 11th AVE NW, CALGARY, AB
PH: 403.279.8521 FAX: 403.279.7643

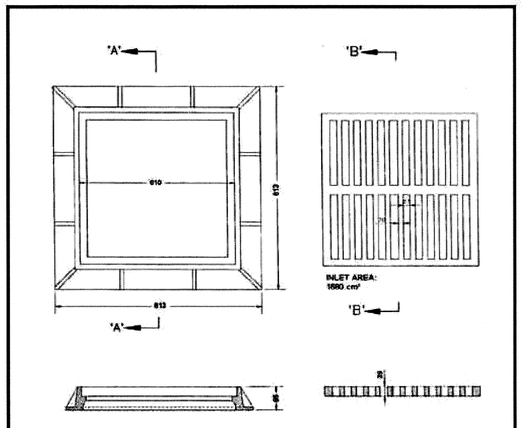


INSIDE DIAMETER NOMINAL (mm)	INSIDE DIAMETER ACTUAL (mm)	SPIGOT LENGTH (mm)	WALL THICKNESS (mm)	SLAB TOP THICKNESS (mm)	BASE THICKNESS (mm)
1500	1524	121	171	265	280
1800	1829	127	197	265	280
2100	2134	127	222	270	280
2400	2438	127	248	280	280
2700	2743	149	273	280	280
3000	3048	152	279	270	280

DRAWN BY:	LUCAS STEFAN	TYPICAL LARGE DIAMETER MANHOLE DETAIL	INLAND Pipe
SCALE:	N/A		
DATE:	NOVEMBER 16, 2015	DIMENSIONS IN mm	
DRAWING #:	LDMH DETAILS		
REVISION #:	Rev. 1		
CHECKED BY:	TYSON DYCK		

7136 11th AVE NW, CALGARY, AB
PH: 403.279.8521 FAX: 403.279.7643

CATCHBASIN MANHOLE AND SLAB TOP SUPPLIED BY THE TOWN OF DRAYTON VALLEY



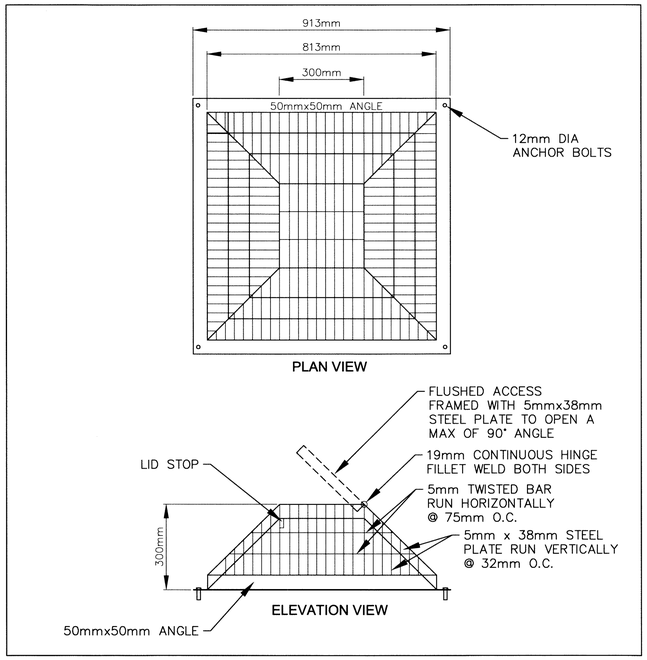
SPECIFICATIONS:

THE CASTINGS SHALL BE TRUE TO PATTERN AND FREE FROM CINDOKE, GAS HOLES, FLAWS AND EXCESSIVE SHRINKAGE. SURFACES OF THE CASTINGS SHALL BE FREE FROM RUST ON SAND AND SHALL BE REASONABLY SMOOTH. RUNNERS, RISERS, FINS AND OTHER CAST ON PIECES SHALL BE REMOVED. IN OTHER RESPECT THE CASTINGS SHALL CONFORM TO WHATEVER POINTS MAY BE AGREED UPON BETWEEN THE MANUFACTURER AND THE ENGINEER. UPON REQUEST OF THE ENGINEER THE MANUFACTURER SHALL BE PREPARED TO CERTIFY THAT HIS PRODUCT CONFORMS TO THE REQUIREMENTS OF A.S.T.M. DESIGNATION A-48

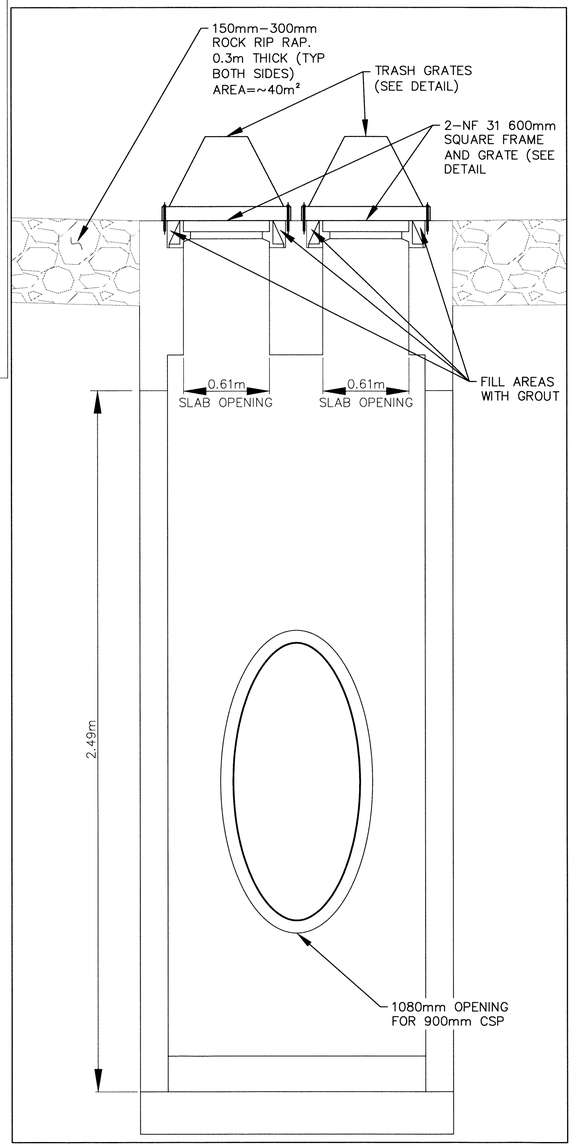
Norwood Foundry LIMITED

600mm (24") SQUARE CATCH BASIN FRAME & GRATE

NF-31



913mm SQUARE TRASH GRATE
1:10



1800mm CATCHBASIN MANHOLE DETAIL
HOR 1:10
VERT 1:5

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PROFESSIONAL ENGINEER G. FITZNER ALBERTA
June 4/18

SENON ENGINEERING INC.
APEGA PERMIT TO PRACTICE NO: P12108

TOWN OF DRAYTON VALLEY PULLING TOGETHER

SENON ENGINEERING INC.

PROJECT

SLOPE AND DRAINAGE REHABILITATION in NE 16-49-7-5 ROADWAY PLAN 1099 LZ TOWN OF DRAYTON VALLEY

DRAWING

DETAILS

DESIGN	DATE	SCALE
JH	05/29/18	NTS
DRAWN JH	PROJECT NO. 336-000	
CHECKED GF	DRAWING NO	REV
APPROVED	DET	1