INSTRUCTIONS TO TENDERERS

Lang Municipal Drain 2018
Municipality of Brockton

Sealed Tenders shall be received by the Clerk of the Municipality of Brockton at her office (100 Scott Street, P.O. Box 68, Walkerton, Ontario) until: Friday, February 15, 2019 at 12:00 Noon, Local Time.

1. A Certified cheque is required as Tender security in the amount of $20,000.00.

2. Further information and particulars are available at the office of the Engineers:

   Dietrich Engineering Limited
   Consulting Engineers
   10 Alpine Court
   Kitchener, Ontario N2E 2M7
   (519) 880-2708

3. The Contractor shall return a completed copy of the Scope of Work along with the completed Form of Tender and Agreement to the Municipality. For complete Scope of Work, see Plan, Profiles, Specifications and Special Provisions (Division H of Specifications).

4. This drain shall be constructed in accordance with the latest applicable “Specifications for the Construction of Municipal Drainage Works”, consisting of the following Divisions:

   DIVISION A - General Conditions
   DIVISION B - Specification for Open Drains
   DIVISION C - Specifications for Tile Drains
   DIVISION H - Special Provisions

5. The Contractor shall supply all labour, equipment and materials to complete the drainage works as shown on the Plan(s) and described in the Specifications. The Contractor shall include in the Tender price all applicable Federal and Provincial Sales Taxes.

6. Tenders shall be made on a lump sum basis on the forms provided for the complete works. Acceptance of the Tender by the Municipality shall constitute a formal and binding Contract when signed by the Township officials.

7. Lowest or any Tender not necessarily accepted at the discretion of the Municipality of Brockton in accordance with the Purchasing and Procurement Policy.

FORM OF TENDER AND AGREEMENT

Lang Municipal Drain 2018
Municipality of Brockton

TO: Members of Municipal Council
RE: Construction of the Lang Municipal Drain 2018

The undersigned, having carefully examined the Plan, Profiles, Specifications and the site of the work, and understanding all conditions, hereby offers to enter into a Contract to supply all materials and to construct the said work for the Municipality complete and ready for use in accordance with the Plan, Profiles and Specifications on file at the office of the Engineer, which Drawings and Specifications form the basis of the proposal for the following prices.
To Wit:

TOTAL CONSTRUCTION COSTS	**$** _____
13% H.S.T.	$ _____
TOTAL TENDER LANG MUNICIPAL DRAIN 2018	**$** _____

A Certified cheque is required as Tender security in the amount of $20,000.00 payable to the Municipality and a copy of the Scope of Work are enclosed.

Work **shall** begin after	**April 1, 2019**
Work **shall** be completed on or before	**May 15, 2019**

The Contractor shall comply with the above completion date. Failure to do so will render the Tender liable for rejection by the Municipality.

OFFERED ON BEHALF OF THE CONTRACTOR	ACCEPTED ON BEHALF OF THE MUNICIPALITY
Company_____	Mayor _____
Authorized Signature _____	Clerk _____
Address _____	Date _____
_____	[Seal]
Telephone ( ) _____ Date _____	

This proposal or Form of Tender and Agreement when signed and offered by the Contractor shall constitute a formal and binding Contract when accepted and signed on behalf of the Municipality.

SCOPE OF WORK

Lang Municipal Drain 2018
Municipality of Brockton
Reference No. 1631

Labour, Equipment and Materials

A) MAIN DRAIN (OPEN)

	Description	Quantity	$/Unit	Total
1)	Clearing, Grubbing & Mulching (Sta. 0+000 to Sta. 0+192)	l.s.		$
2)	Open ditch excavation (Sta. 0+000 to Sta. 0+192)	l.s.		$
TOTAL CONSTRUCTION COSTS MAIN DRAIN (OPEN)				**$**

B) MAIN DRAIN (CLOSED)

	Description	Quantity	$/Unit	Total
1)	Stripping and stock piling topsoil (Approximately 15 metre width)	1,088 m	$	$
2)	Supply 750mm diameter, solid high density polyethylene outlet pipes complete with rodent grates (320 kPa, CSA B182.8, split coupler joining system, Twin pipe system (Sta. 0+330 to Sta. 0+336)	12 m	$	$
	Installation of 750mm diameter, H.D.P.E. outlet pipes complete with quarry stone rip-rap protection and geotextile filter material (Mirafi 180N or equivalent, approximately 40 m2, Twin pipe system (Sta. 0+330 to Sta. 0+336)	l.s.		$
3)	Supply 675mm diameter concrete field tile (2400D)	391 m	$	$
a)	Installation of 675mm diameter concrete field tile by means of excavator on crushed stone bedding (Twin pipe system Sta. 0+336 to Sta.0+470)	268 m	$	$
b)	Installation of 675mm diameter concrete field tile by means of a wheel trencher (Sta. 0+798 to Sta. 0+921)	123 m	$	$

4)	Supply 825mm diameter concrete field tile (2400D)	241	m	$	$
	Installation of 825mm diameter concrete field tile by means of a wheel trencher (Sta. 0+470 to Sta. 0+711)	241	m	$	$
5)	Supply 750mm diameter concrete field tile (2400D)	75	m	$	$
	Installation of 750mm diameter concrete field tile by means of a wheel trencher (Sta. 0+711 to Sta. 0+786)	75	m	$	$
6)	Supply 600mm diameter concrete field tile (2400D)	298	m	$	$
	Installation of 600mm diameter concrete field tile by means of a wheel trencher (Sta. 0+921 to Sta.1+219)	298	m	$	$
7)	Supply 750mm diameter, solid high density polyethylene pipe (320 kPa, CSA B182.8, split coupler joining system) (Sta. 0+786 to Sta. 0+798)	12	m	$	$
	Installation of 750mm H.D.P.E. pipe by means of excavator on crushed stone bedding (Sta. 0+786 to Sta. 0+798)	12	m	$	$
8)	Supply 350mm diameter concrete field tile	175	m	$	$
	Installation of 350mm diameter concrete field tile by means of a wheel trencher (Sta. 1+251 to Sta. 1+329) (Sta. 1+341 to Sta. 1+438)	175	m	$	$
9)	Supply 375mm diameter solid high density polyethylene pipe (320 kPa, CSA B182.8 split coupler joining system)	24	m	$	$
a)	Installation of 375mm H.D.P.E. pipe laneway crossing by means of excavator on crushed stone bedding (Sta. 1+329 to Sta. 1+341)	12	m	$	$
b)	Installation of 375mm H.D.P.E. pipe by means of excavator on crushed stone bedding (Sta. 1+239 to Sta. 1+251)	12	m	$	$
10)	Supply 200mm diameter solid high density polyethylene pipe (320 kPa, CSA B182.8 split coupler joining system)	12	m	$	$
	Installation of 200mm H.D.P.E. pipe by means of excavator on crushed stone bedding (for stub to Lot 10, Concession 5)	12	m	$	$
11)	Supply & install 900mm x 2400mm concrete catch basin (Sta. 0+357)	1	ea.	$	$

12)	Supply & install 900mm x 2400mm concrete junction box (Sta. 0+470)	1	ea.	$	$
13)	Supply & install 900mm x 1200mm concrete junction box (Sta. 0+711 & Sta. 1+203)	2	ea.	$	$
14)	Supply & install 600mm x 600mm concrete catch basin (Sta. 1+341 & Sta. 1+438)	2	ea.	$	$
15)	Supply & install 750mm diameter high density polyethylene 45 deg. elbow (320 kPa, CSA B182.1, c/w bell ends, Sta. 0+792)	1	ea.	$	$
16)	Supply & install 375mm diameter high density polyethylene 45 deg. elbows (320 kPa, CSA B182.1, split coupler joining system, Sta. 1+239 & Sta. 1+245)	2	ea.	$	$
17)	Construction of a plunge pool at the outlet (Sta. 0+330 to Sta. 0+320)		l.s.		$
	Sub-Total				**$**
18)	Open Ditch Enclosure (Approximately 5,200m^3)				
a)	Open ditch cleanout prior to ditch enclosure to salvage and stock pile available topsoil	834	m	$	$
b)	Loading and hauling of excess subsoil from tile drain installation to backfill existing open ditch (Approximately 780m^3)	780	m^3	$	$
c)	Stripping topsoil from designated fill site & replacing and leveling back over fill site	7,000	m^2	$	$
d)	Loading and hauling of fill material from designated fill site to backfill existing open ditch (Approximately 4,420m^3)	4,420	m^3	$	$
e)	Levelling & fine grading of topsoil over backfilled ditch and new tile drain with an approved bulldozer		l.s.		$
	Sub-Total				**$**

19)	Work to be done on Concession Road 4 East Road Allowance (Sta. 1+219 to Sta. 1+239)				
	a) Stripping and stock piling topsoil (Approximately 15 metre width)	10	m	$	$
	b) Supply 525mm diameter solid high density polyethylene pipe (320 KPa, CSA B182.8 bell & spigot joining system)	20	m	$	$
	Installation of 525mm H.D.P.E. pipe by means of excavator on crushed stone bedding (Sta. 1+219 to Sta. 1+239)	20	m	$	$
	c) Supply 450mm diameter H.D.P.E. pipe (320 kPa) Solid Pipe	14	m	$	$
	Installation of 450mm H.D.P.E. pipe by means of excavator on crushed stone bedding (Sta. 1+223 to Sta. 1+237)	14	m	$	$
	d) Supply & install 900mm x 1200mm concrete ditch inlet catch basins (Sta. 1+219 & Sta. 1+239)	2	ea.	$	$
	e) Asphalt patch - 50mm HL4	6	t	$	$
	Sub-Total				**$**

TOTAL CONSTRUCTION COSTS
MAIN DRAIN (CLOSED) **$**

C) BRANCH "A"

	Description	Quantity		$/Unit	Total
1)	Stripping and stock piling topsoil (Approximately 15 metre width)	457	m	$	$
2)	Supply 300mm diameter concrete field tile	200	m	$	$
	Installation of 300mm diameter concrete field tile by means of a wheel trencher (Sta. 0+000 to Sta. 0+200)	200	m	$	$
3)	Supply 250mm diameter concrete field tile	257	m	$	$
	Installation of 250mm diameter concrete field tile by means of a wheel trencher (Sta. 0+200 to Sta.0+457)	257	m	$	$
4)	Supply & install 600mm x 600mm concrete catch basin (Sta. 0+457)	1	ea.	$	$

TOTAL CONSTRUCTION COSTS
BRANCH "A" **$**

D) BRANCH "B"

	Description	Quantity	$/Unit	Total
1)	Stripping and stock piling topsoil (Approximately 15 metre width)	194 m	$	$
2)	Supply 450mm diameter concrete field tile	182 m	$	$
	Installation of 450mm diameter concrete field tile by means of a wheel trencher (Sta. 0+000 to Sta.0+182)	182 m	$	$
3)	Supply 450mm diameter H.D.P.E. pipe (320 kPa) Solid Pipe	12 m	$	$
	Installation of 450mm diameter concrete field tile by means of excavator on crushed stone bedding (Sta. 0+182 to Sta.0+194)	12 m	$	$
4)	Supply & install 900mm x 1200mm concrete catch basin (Sta. 0+194)	1 ea.	$	$

TOTAL CONSTRUCTION COSTS BRANCH "B" **$**

E) PROVISIONAL ITEMS

A Provisional Item is an item that may or may not be required as a part of the Contract. The decision as to whether a Provisional Item will form part of the Contract will be at the discretion of the engineer at time of construction. Payment for Provisional Items will only be made for work authorized in writing (text or email) by the Engineer. Payment for work performed under a Provisional Item shall be based on the Unit Price bid in the Scope of Work below.

	Description	Quantity		$/Unit	Total
1)	Additional costs associated with installation of concrete field tile due to poor soil conditions. Additional costs include the supply of all labour, equipment and materials required.				
a)	**825mm diameter concrete field tile (2400D)**				
	150mm depth of stone bedding and backfill up to haunches (no geotextile).	75	m	$	$
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	75	m	$	$
b)	**750mm diameter concrete field tile (2400D)**				
	150mm depth of stone bedding and backfill up to haunches (no geotextile).	75	m	$	$
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	75	m	$	$
c)	**675mm diameter concrete field tile (2400D)**				
	150mm depth of stone bedding and backfill up to haunches (no geotextile).	75	m	$	$
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	75	m	$	$
d)	**600mm diameter concrete field tile (2400D)**				
	150mm depth of stone bedding and backfill up to haunches (no geotextile).	100	m	$	$
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	100	m	$	$
e)	**450mm diameter concrete field tile.**				
	150mm depth of stone bedding and backfill up to haunches (no geotextile).	50	m	$	$
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	50	m	$	$

f) **350mm diameter concrete field tile.**

	150mm depth of stone bedding and backfill up to haunches (no geotextile).	50	m	$ _____ $ _____
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	50	m	$ _____ $ _____

g) **300mm diameter concrete field tile.**

	150mm depth of stone bedding and backfill up to haunches (no geotextile).	50	m	$ _____ $ _____
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	50	m	$ _____ $ _____

h) **250mm diameter concrete field tile.**

	150mm depth of stone bedding and backfill up to haunches (no geotextile).	75	m	$ _____ $ _____
	300mm depth of stone bedding and backfill up to haunches (bedding wrapped in no geotextile filte material).	75	m	$ _____ $ _____
2)	Supply and place quarry stone rip-rap including geotextile filter material underlay.	50	m^2	$ _____ $ _____
3)	Wheel machine lift outs due to stoney conditions.	5	ea.	$ _____ $ _____
4)	Additional stripping, stock piling and levelling of top soil not covered in the above items.	500	m^2	$ _____ $ _____
5)	Tile Connections			
a)	100mm diameter tile drain	10	ea.	$ _____ $ _____
b)	150mm diameter tile drain	5	ea.	$ _____ $ _____
c)	200mm diameter tile drain	1	ea.	$ _____ $ _____

TOTAL ESTIMATED PROVISIONAL ITEMS **$** _____

TOTAL CONSTRUCTION COSTS
LANG MUNICIPAL DRAIN 2018 **$** _____

Summary of Construction Costs

A) MAIN DRAIN (OPEN)	$
B) MAIN DRAIN (CLOSED)	$
C) BRANCH "A"	$
D) BRANCH "B"	$
E) PROVISIONAL ITEMS	$
TOTAL CONSTRUCTION COSTS LANG MUNICIPAL DRAIN 2018	**$**
H.S.T. 13%	$
TOTAL TENDER LANG MUNICIPAL DRAIN 2018	**$**

The Engineer's Estimated Construction Costs do not include Provisional Items (Section E)

The **"TOTAL CONSTRUCTION COSTS"** on the **"FORM OF TENDER AND AGREEMENT"** shall include **PROVISIONAL ITEMS** (Section 'E' above) and shall be considered the Contractor's bid price.

DIVISION A
GENERAL CONDITIONS

DIVISION A
GENERAL CONDITIONS

A.1 SCOPE

The work to be done under this contract consists of supplying all labour, equipment and materials to construct the drainage work as outlined in the Scope of Work, Drawings, General Conditions and other Specifications.

A.2 TENDERS

Tenders are to be submitted on a lump sum basis for the complete works or a portion thereof, as instructed by the Municipality. The Scope of Work must be completed and submitted with the Form of Tender and Agreement. A certified cheque is required as Tender Security, payable to the Treasurer of the Municipality.

All certified cheques, except that of the bidder to whom the work is awarded will be returned within ten (10) days after the tender closing. The certified cheque of the bidder to whom the work is awarded will be retained as Contract Security and returned when the Municipality receives a Completion Certificate for the work.

A certified cheque is not required if the Contractor provides an alternate form of Contract Security such as a Performance Bond for 100% of the amount of the Tender or other satisfactory security, if required/permitted by the Municipality. A Performance Bond may also be required to insure maintenance of the work for a period of one (1) year after the date of the Completion Certificate.

A.3 EXAMINATIONS OF SITE, DRAWINGS AND SPECIFICATIONS

The Tenderer must examine the premises and site to compare them with the Drawings and Specifications in order to satisfy himself of the existing conditions and extent of the work to be done before submission of his Tender. No allowance shall subsequently be made on behalf of the Contractor by reason of any error on his part. Any estimates of quantities shown or indicated on the Drawings, or elsewhere are provided for the convenience of the Tenderer. Any use made of these quantities by the Tenderer in calculating his Tender shall be done at his own risk. The Tenderer for his own protection should check these quantities for accuracy.

The standard specifications (Divisions B through G) shall be considered complementary and where a project is controlled under one of the Divisions, the remaining Divisions will apply for miscellaneous works.

In case of any inconsistency or conflict between the Drawings and Specifications, the following order of precedence shall apply:

- Direction of the Engineer
- Special Provisions (Division H)
- Scope of Work
- Contract Drawings
- Standard Specifications (Divisions B through G)
- General Conditions (Division A)

A.4 PAYMENT

Progress payments equal to 87±% of the value of work completed and materials incorporated in the work will be made to the Contractor monthly. An additional ten per cent (10±%) will be paid 45 days after the final acceptance by the Engineer, and three per cent (3±%) of the Contract price may be reserved by the Municipality as a maintenance holdback for a one (1) year period from the date of the Completion Certificate. A greater percentage of the Contract price may be reserved by the Municipality for the same one (1) year period if in the opinion of the Engineer, particular conditions of the Contract requires such greater holdback.

After the completion of the work, any part of this reserve may be used to correct defects developed within that time from faulty workmanship and materials, provided that notice shall first be given to the Contractor and that he may promptly make good such defects.

A.5 CONTRACTOR'S LIABILITY INSURANCE

Prior to commencement of any work, the Contractor shall file with the Municipality evidence of compliance with all Municipality insurance requirements (Liability Insurance, WSIB, etc.) for no less than the minimum amounts as stated in the Purchasing Procedures of the Municipality. All insurance coverage shall remain in force for the entire contract period including the warranty period which expires one year after the date of the Completion Certificate.

The following are to be named as co-insured: Successful Contractor
Sub-Contractor
Municipality
Dietrich Engineering Ltd.

A.6 LOSSES DUE TO ACTS OF NATURE, ETC.

All damage, loss, expense and delay incurred or experienced by the Contractor in the performance of the work, by reason of unanticipated difficulties, bad weather, strikes, acts of nature, or other mischances shall be borne by the Contractor and shall not be the subject of a claim for additional compensation.

A.7 COMMENCEMENT AND COMPLETION OF WORK

The work must commence as specified in the Form of Tender and Agreement. If conditions are unsuitable due to poor weather, the Contractor may be required, at the discretion of the Engineer to postpone or halt work until conditions become acceptable and shall not be subject of a claim for additional compensation.

The Contractor shall give the Engineer a minimum of 48 hours notice before commencement of work. The Contractor shall then arrange a meeting to be held on the site with Contractor, Engineer, and affected Landowners to review in detail the construction scheduling and other details of the work.

If the Contractor leaves the job site for a period of time after initiation of work, he shall give the Engineer and the Municipality a minimum of 24 hours notice prior to returning to the project. If any work is commenced without notice to the Engineer, the Contractor shall be fully responsible for all such work undertaken prior to such notification.

The work must proceed in such a manner as to ensure its completion at the earliest possible date and within the time limit set out in the Form of Tender and Agreement.

A.8 WORKING AREA AND ACCESS

Where any part of the drain is on a road allowance, the road allowance shall be the working area. For all other areas, the working area available to the Contractor to construct the drain is specified in the Special Provisions (Division H).

Should the specified widths become inadequate due to unusual conditions, the Contractor shall notify the Engineer immediately. Where the Contractor exceeds the specified working widths without authorization, he shall be held responsible for the costs of all additional damages.

If access off an adjacent road allowance is not possible, each Landowner on whose property the drainage works is to be constructed, shall designate access to and from the working area. The Contractor shall not enter any other lands without permission of the Landowner and he shall compensate the Landowner for damage caused by such entry.

A.9 SUB-CONTRACTORS

The Contractor shall not sublet the whole or part of this Contract without the approval of the Engineer.

A.10 PERMITS, NOTICES, LAWS AND RULES

The Contractor shall obtain and pay for all necessary permits or licenses required for the execution of the work (but this shall not include MTO encroachment permits, County Road permits permanent easement or rights of servitude). The Contractor shall give all necessary notices and pay for all fees required by law and comply with all laws, ordinances, rules and regulations relating to the work and to the preservation of the public's health and safety.

A.11 RAILWAYS, HIGHWAYS AND UTILITIES

A minimum of 72 hours' notice to the Railway or Highways, exclusive of Saturdays, Sundays, and Statutory Holidays, is required by the Contractor prior to any work activities on or affecting the applicable property. In the case of affected Utilities, a minimum of 48 hours' notice to the utility owner is required.

A.12 ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any error or unusual conditions which may be found. Any attempt by the Contractor to correct the error on his own shall be done at his own risk. Any additional cost incurred by the Contractor to remedy the wrong decision on his part shall be borne by the Contractor. The Engineer shall make the alterations necessary to correct errors or to adjust for unusual conditions during which time it will be the Contractor's responsibility to keep his men and equipment gainfully employed elsewhere on the project.

The Contract amount shall be adjusted in accordance with a fair evaluation of the work added or deleted.

A.13 ALTERATIONS AND ADDITIONS

The Engineer shall have the power to make alterations in the work shown or described in the Drawings and Specifications and the Contractor shall proceed to make such changes without causing delay. In every such case, the price agreed to be paid for the work under the Contract shall be increased or decreased as the case may require according to a fair and reasonable evaluation of the work added or deleted. The valuation shall be determined as a result of negotiations between the Contractor and the Engineer, but in all cases the Engineer shall maintain the final responsibility for the decision. Such alterations and variations shall in no way render the Contract void. No claims for a variation or alteration in the increased or decreased price shall be valid unless done in pursuance of an order from the Engineer and notice of such claims made in writing before commencement of such work. In no such case shall the Contractor commence work which he considers to be extra before receiving the Engineer's approval.

A.14 SUPERVISION

The Contractor shall give the work his constant supervision and shall keep a competent foreman in charge at the site.

A.15 FIELD MEETINGS

At the discretion of the Engineer, a field meeting with the Contractor or his representative, the Engineer and with those others that the Engineer deems to be affected, shall be held at the location and time specified by the Engineer.

A.16 PERIODIC AND FINAL INSPECTIONS

Periodic inspections by the Engineer will be made during the performance of the work. If ordered by the Engineer, the Contractor shall expose the drain as needed to facilitate inspection by the Engineer.

Final inspection by the Engineer will be made within twenty (20) days after he has received notice from the Contractor that the work is complete.

A.17 ACCEPTANCE BY THE MUNICIPALITY

Before any work shall be accepted by the Municipality, the Contractor shall correct all deficiencies identified by the Engineer and the Contractor shall leave the site neat and presentable.

A.18 WARRANTY

The Contractor shall repair and make good any damages or faults in the drain that may appear within one (1) year after its completion (as dated on the Completion Certificate) as the result of the imperfect or defective work done or materials furnished if certified by the Engineer as being due to one or both of these causes; but nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the laws of the Country, Province or Locality in which the work is being done. Neither the Completion Certificate nor any payment there under, nor any provision in the Contract Documents shall relieve the Contractor from his responsibility.

A.19 TERMINATION OF CONTRACT BY THE MUNICIPALITY

If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days notice in writing from the Engineer to supply additional workmen or materials to commence or complete the works, or if he should fail to make prompt payment to Sub-Contractors, or for material, or labour, or persistently disregards laws, ordinances, or the instruction of the Engineer, or otherwise be guilty of a substantial violation of the provisions of the Contract, then the Municipality, upon the certificate of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, by giving the Contractor written notice, terminate the employment of the Contractor and take possession of the premises, and of all materials, tools and appliances thereon, and may finish the work by whatever method the Engineer may deem expedient but without delay or expense. In such a case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price will exceed the expense of finishing the work including compensation to the Engineer for his additional services and including the other damages of every name and nature, such excess shall be paid by the Contractor. If such expense will exceed such unpaid balance, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer.

If the Contract is terminated by the Municipality due to the Contractor's failure to properly commence the works, the Contractor shall forfeit the certified cheque bid deposit and furthermore shall pay to the Municipality an amount to cover the increased costs, if any, associated with a new Tender for the Contract being terminated.

If any unpaid balance and the certified cheque do not match the monies owed by the Contractor upon termination of the Contract, the Municipality may also charge such expense against any money which may thereafter be due to the Contractor from the Municipality.

A.20 TESTS

The cost for the testing of materials supplied to the job by the Contractor shall be borne by the Contractor. The Engineer reserves the right to subject any lengths of any tile or pipe to a competent testing laboratory to ensure the adequacy of the tile or pipe. If any tile supplied by the Contractor is determined to be inadequate to meet the applicable A.S.T.M. standards, the Contractor shall bear full responsibility to remove and/or replace all such inadequate tile in the Contract with tile capable of meeting the A.S.T.M. Standards.

A.21 POLLUTION

The Contractor shall keep their equipment in good repair. The Contractor shall refuel or repair equipment away from open water.

If polluted material from construction materials or equipment is caused to flow into the drain, the Contractor shall immediately notify the Ministry of the Environment, and proceed with the Ministry's protocols in place to address the situation.

A.22 SPECIES AT RISK

If a Contractor encounters a known Species at Risk as designated by the MNR or DFO, the Contractor shall notify the Engineer immediately and follow the Ministry's guidelines to deal with the species.

A.23 ROAD CROSSINGS

This specification applies to all road crossings (Municipality, County, Regional, or Highway) where no specific detail is provided on the drawings or in the standard specifications. This specification in no way limits the Road Authority's regulations governing the construction of drains on their Road Allowance.

A.23.1 Road Occupancy Permit

Where applicable, the Contractor must submit an application for a road occupancy permit to the Road Authority and allow a minimum of five (5) working days for its review and issuance.

A.23.2 Road Closure Request and Construction Notification

The Contractor shall submit written notification of construction and request for road closure (if applicable) to the Road Authority and the Engineer for review and approval a minimum of five (5) working days prior to proceeding with any work on the road allowance. The Contractor shall be responsible for notifying all applicable emergency services, schools, etc. of the road closure or construction taking place.

A.23.3 Traffic Control

The Contractor shall supply flagmen, and warning signs and ensure that detour routes are adequately signed in accordance with no less than the minimum standards as set out in the Ontario Traffic Manual's Book 7.

A.23.4 Weather

No construction shall take place during inclement weather or periods of poor visibility.

A.23.5 Equipment

No construction material and/or equipment is to be left within three (3) metres of the travelled portion of the road overnight or during periods of inclement weather.

If not stated on the drawings, the road crossing shall be constructed by open cut method. Backfill from the top of the cover material over the subsurface pipe or culvert to the under side of the road base shall be Granular "B". The backfill shall be placed in lifts not exceeding 300mm in thickness and each lift shall be thoroughly compacted to 98% Standard Proctor. Granular "B" road base for County Roads and Highways shall be placed to a 450mm thickness and Granular "A" shall be placed to a thickness of 200mm. Granular road base materials shall be thoroughly compacted to 100% Standard Proctor.

Where the road surface is paved, the Contractor shall be responsible for placing HL-8 Hot Mix Asphalt patch at a thickness of 50mm or of the same thickness as the existing pavement structure. The asphalt patch shall be flush with the existing roadway on each side and without overlap.

Excavated material from the trench beyond 1.25 metres from the travelled portion or beyond the outside edge of the gravel shoulder may be used as backfill in the trench in the case of covered drains. The material shall be compacted in lifts not exceeding 300mm.

A.24 LANEWAYS

All pipes crossing laneways shall be backfilled with material that is clean, free of foreign material or frozen particles and readily tamped or compacted in place unless otherwise specified. Laneway culverts on open ditch projects shall be backfilled with material that is not easily erodible. All backfill material shall be thoroughly compacted as directed by the Engineer.

Culverts shall be bedded with a minimum of 300mm of granular material. Granular material shall be placed simultaneously on each side of the culvert in lifts not exceeding 150mm in thickness and compacted to 95% Standard Proctor Density. Culverts shall be installed a minimum of 10% of the culvert diameter below design grade with a minimum of 450mm of cover over the pipe unless otherwise noted on the Drawings.

The backfill over culverts and subsurface pipes at all existing laneways that have granular surfaces on open ditch and closed drainage projects shall be surfaced with a minimum of 300mm of Granular “B” material and 150mm of Granular “A” material. All backfill shall be thoroughly compacted as directed by the Engineer. All granular material shall be placed to the full width of the travelled portion.

Any settling of backfilled material shall be repaired by or at the expense of the Contractor during the warranty period of the project and as soon as required.

A.25 FENCES

No earth is to be placed against fences and all fences removed by the Contractor shall be replaced by him in as good a condition as found. Where practical the Contractor shall take down existing fences in good condition at the nearest anchor post and roll it back rather than cutting the fence and attempting to patch it. The replacement of the fences shall be done to the satisfaction of the Engineer. Any fences found in such poor condition where the fence is not salvageable, shall be noted and verified with the Engineer prior to commencement of work.

Fences damaged beyond repair by the Contractor’s negligence shall be replaced with new materials, similar to those materials of the existing fence, at the Contractor’s expense. The replacement of the fences shall be done to the satisfaction of the Landowner and the Engineer.

Any fences paralleling an open ditch that are not line fences that hinder the proper working of the excavating machinery, shall be removed and rebuilt by the Landowner at his own expense.

The Contractor shall not leave fences open when he is not at work in the immediate vicinity.

A.26 LIVESTOCK

The Contractor shall provide each landowner with 48 hours notice prior to removing any fences along fields which could possibly contain livestock. Thereafter, the Landowner shall be responsible to keep all livestock clear of the construction areas until further notified. The Contractor shall be held responsible for loss or injury to livestock or damage caused by livestock where the Contractor failed to notify the Landowner, or through negligence or carelessness on the part of the Contractor.

A.27 STANDING CROPS

The Contractor shall be responsible for damages to standing crops which are ready to be harvested or salvaged along the course of the drain and access routes if the Contractor has failed to notify the Landowners 48 hours prior to commencement of the work on that portion of the drain.

A.28 SURPLUS GRAVEL

If as a result of any work, gravel or crushed stone is required and not all the gravel or crushed stone is used, the Contractor shall haul away such surplus material.

A.29 IRON BARS

The Contractor is responsible for the cost of an Ontario Land Surveyor to replace any iron bars that are altered or destroyed during the course of the construction.

A.30 RIP-RAP

Rip-rap shall be quarry stone rip-rap material and shall be the sizes specified in the Special Provisions. Broken concrete shall not be used as rip-rap unless otherwise specified.

A.31 CLEARING, GRUBBING AND BRUSHING

This specification applies to all brushing where no specific detail is provided on the drawings or in the Special Provisions.

The Contractor shall clear, brush and stump trees from within the working area that interfere with the installation of the drainage system.

All trees, limbs and brush less than 150mm in diameter shall be mulched. Trees greater than 150mm in diameter shall be cut and neatly stacked in piles designated by the Landowners.

A.32 RESTORATION OF LAWNS

This specification applies to all lawn restoration where no specific detail is provided on the drawings or in the Special Provisions and no allowance for damages has been provided under Section 30 of the Drainage Act RSO 1990 to the affected property.

The Contractor shall supply “high quality grass seed” and the seed shall be broadcast by means of an approved mechanical spreader. All areas on which seed is to be placed shall be loose at the time of broadcast to a depth of 25mm. Seed and fertilizer shall be spread in accordance with the supplier’s recommendations unless otherwise directed by the Engineer. Thereafter it will be the responsibility of the Landowner to maintain the area in a manner so as to promote growth.

DIVISION B
SPECIFICATIONS FOR OPEN DRAINS

DIVISION B
SPECIFICATIONS FOR OPEN DRAINS

B.1 ALIGNMENT

The drain shall be constructed in a straight line and shall follow the course of the present drain or water run unless noted on the drawings. Where there are unnecessary bends or irregularities on the existing course of the drain, the Contractor shall contact the Engineer before commencing work to verify the manner in which such irregularities or bends may be removed from the drain. All curves shall be made with a minimum radius of fifteen (15) metres from the centre line of the drain.

B.2 PROFILE

The Profile Drawing shows the depth of cuts from the top of the bank to the final invert of the ditch in metres and decimals of a metre, and also the approximate depth of excavated material from the bottom of the existing ditch to the final invert of the ditch. These cuts are established for the convenience of the Contractor; however, bench marks (established along the course of the drain) will govern the final elevation of the drain. The location and elevation of the bench marks are given on the Profile Drawing. Accurate grade control must be maintained by the Contractor during ditch excavation.

B.3 EXCAVATION

The bottom width and the side slopes of the ditch shall be those shown on the drawings. If the channel cross-section is not specified it shall be a one metre bottom width with 1.5(h):1(v) side slopes. At locations along the drain where the cross section dimensions change, there shall be a transitional length of not less than 10:1 (five metre length to 0.5 metre width differential). Where the width of the bottom of the existing ditch is sufficient to construct the design width, then construction shall proceed without disturbing the existing banks.

Where existing side slopes become unstable, the Contractor shall immediately notify the Engineer. Alternative methods of construction and/or methods of protection will then be determined prior to continuing work.

Where an existing drain is being relocated or where a new drain is being constructed, the Contractor shall strip the topsoil for the full width of the drain, including the location of the spoil pile. Upon completion of levelling, the topsoil shall be spread to an even depth across the full width of the spoil.

An approved hydraulic excavator shall be used to carry out the excavation of the open ditch unless otherwise directed by the Engineer.

B.4 EXCAVATED MATERIAL

Excavated material shall be placed on the low side of the drain or opposite trees and fences. The Contractor shall contact all Landowners before proceeding with the work to verify the location to place and level the excavated material.

No excavated material shall be placed in tributary drains, depressions, or low areas which direct water behind the spoil bank. The excavated material shall be placed and levelled to a maximum depth of 200 mm, unless instructed otherwise and commence a minimum of one (1) metre from the top of the bank. The edge of the spoil bank away from the ditch shall be feathered down to the existing ground; the edge of the spoil bank nearest the ditch shall have a maximum slope of 2(h):1(v). The material shall be levelled such that it may be cultivated with ordinary farm equipment without causing undue hardship to the farm machinery and farm personnel. No excavated material shall cover any logs, brush, etc. of any kind.

Any stones or boulders which exceed 300mm in diameter shall be removed and disposed of in a location specified by the Landowner.

Where it is necessary to straighten any unnecessary bends or irregularities in the alignment of the ditch or to relocate any portion or all of an existing ditch, the excavated material from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and the old ditch, no extra compensation will be allowed for this work and must be included in the Contractor's lump sum price for the open work.

B.5 EXCAVATION AT EXISITING BRIDGE AND CULVERT SITES

The Contractor shall excavate the drain to the full specified depth under all bridges and to the full width of the structure. Temporary bridges may be carefully removed and left on the bank of the drain but shall be replaced by the Contractor when the excavation is complete. Permanent bridges must, if at all possible, be left intact. All necessary care and precautions shall be taken to protect the structure. The Contractor shall notify the Landowner if excavation will expose the footings or otherwise compromise the structural integrity of the structure.

The Contractor shall clean through all pipe culverts to the grade and width specified on the profile.

B.6 PIPE CULVERTS

All pipe culverts shall be installed in accordance with the standard detail drawings. If couplers are required, five corrugation couplers shall be used for up to and including 1200mm diameter pipes and 10 corrugation couplers for greater than 1200mm diameter pipes.

When an existing crossing is being replaced, the Contractor may backfill the new culvert with the existing native material that is free of large rocks and stones. The Contractor is responsible for any damage to a culvert pipe that is a result of rocks or stones in the backfill.

B.7 RIP-RAP PROTECTION FOR CULVERTS

Quarry stone rip-rap shall be used as end treatment for new culverts and placed on geotextile filter material (Mirafi 160N or approved equal). The rip-rap shall be adequately keyed in along the bottom of the slope, and shall extend to the top of the pipe or as directed on the drawings. The maximum slope for rip-rap shall be 1(h):1(v) or as directed by the Engineer.

The Contractor shall be responsible for any defects or damages that may develop in the rip-rap or the earth behind the rip-rap that the Engineer deems to have been fully or partially caused by faulty workmanship or materials.

B.8 CLEARING, GRUBBING AND MULCHING

Prior to excavation, all trees, scrub, fallen timber and debris shall be removed from the side slopes of the ditch and for such a distance on the working side so as to eliminate any interference with the construction of the drain or the spreading of the spoil. The side slopes shall be neatly cut and cleared flush with the slope whether or not they are affected directly by the excavation. With the exception of large stumps causing damage to the drain, the side slopes shall not be grubbed. All other cleared areas shall be grubbed and the stumps put into piles for disposal by the Landowner.

All trees or limbs 150mm or larger, that is necessary to remove, shall be cut, trimmed and neatly stacked in the working width for the use or disposal by the Landowner. Brush and limbs less than 150mm in diameter shall be mulched. Clearing, grubbing and mulching shall be carried out as a separate operation from the excavation of the ditch, and shall not be completed simultaneously at the same location.

B.9 TRIBUTARY TILE OUTLETS

All tile outlets in existing ditches shall be marked by the Landowner prior to excavation. The Contractor shall guard against damaging the outlets of tributary drains. Any tile drain outlets that were marked or noted on the drawings and are subsequently damaged by the Contractor shall be repaired by the Contractor at his expense. The Landowner shall be responsible for repairs to damaged tile outlets that were not marked.

B.10 SEEDING

The side slopes where disturbed shall be seeded using an approved grass seed mixture. The grass seed shall be applied the same day as the excavation of the open ditch.

Grass seed shall be fresh, clean and new crop seed, meeting the requirements of the MTO and composed of the following varieties mixed in the proportion by weight as follows:

- 55% Creeping Red Fescue
- 40% Perennial Rye Grass
- 5% White Clover

Grass seed shall be applied at the rate of 100 kg/ha.

B.11 HYDRO SEEDING

The areas specified in the contract document shall be hydro seeded and mulched upon completion of construction in accordance with O.P.S.S. 572.

B.12 HAND SEEDING

Placement of the seed shall be of means of an approved mechanical spreader.

B.13 COMPLETION

At the time of completion and final inspection, all work in the Contract shall have the full dimensions and cross-sections specified without any allowance for caving of banks or sediment in the ditch bottom.

DIVISION C
SPECIFICATIONS FOR TILE DRAINS

DIVISION C
SPECIFICATIONS FOR TILE DRAINS

C.1 PIPE MATERIALS

C.1.1 Concrete Tile

Concrete drain tile shall conform to the requirements of the most recent A.S.T.M. specification for Heavy-Duty Extra Quality drain tile. All tile with diameters less than 600mm shall have a pipe strength of 1500D. All tile with diameters 600mm or larger shall have a pipe strength of 2000D.

All tile furnished shall be subject to the approval of the Engineer. All rejected tile are to be immediately removed from the site.

C.1.2 High Density Polyethylene (HDPE) Pipe

All HDPE pipe shall be dual-wall corrugated drainage pipe with a smooth inner wall. HDPE pipe shall have a minimum stiffness of 320 kPa at 5% deflection.

Unless otherwise noted, all sealed HDPE pipe shall have a water tight gasketed bell and spigot joining system meeting the minimum requirements of CSA B182.8. Perforated HDPE pipe shall have a soil tight joining system, and shall be enveloped in non-woven geotextile filter sock.

C.2 ALIGNMENT

The Contractor shall contact the Engineer to establish the course of the drain. Where an existing drain is to be removed and replaced by the new drain, or where the new drain is to be installed parallel to an existing drain, the Contractor shall locate the existing drain (including repairing damaged tile caused by locating) at intervals along the course of the drain. The costs of locating shall be included in the tender price.

The drain shall run in as straight a line as possible throughout its length, except that at intersections of other watercourses or at sharp corners, it shall run on a curve of at least 15 metres radius. The new tile drain shall be constructed at an offset from and parallel with any ditch or defined watercourse in order that fresh backfill in the trench will not be eroded by the flow of surface water.

The Contractor shall exercise care not to disturb any existing tile drain or drains which parallel the course of the new drain, particularly where the new and existing tile act together to provide the necessary capacity. Where any such existing drain is disturbed or damaged, the Contractor shall perform the necessary repair at his expense.

C.3 PROFILE

Benchmarks have been established along the course of the drain which are to govern the elevations of the drain. The location and elevations of the benchmarks are shown on the drawings. Tile is to be installed to the elevation and grade shown on the profiles. Accurate grade control must be maintained by the Contractor at all times.

When installing a drain towards a fixed point such as a bore pipe, the Contractor shall uncover the pipe and confirm the elevation a sufficient distance away from the pipe in order to allow for any necessary minor grade adjustments to be made.

C.4 EXCAVATION

C.4.1 Wheel machine

Unless otherwise specified, all trenching shall be carried out with a wheel machine approved by the Engineer. The wheel machine shall shape the bottom of the trench to conform to the outside diameter of the pipe. The minimum trench width shall be equal to the outside diameter of the pipe plus 100mm on each side of the pipe, unless otherwise specified. The maximum trench width shall be equal to the outside diameter of the pipe plus 300mm on each side of the pipe, unless otherwise specified.

C.4.2 Scalping

Where the depths of cuts in isolated areas along the course of the drain as shown on the profile exceed the capability of the Contractor's wheel machine, he shall lower the surface grade in order that the wheel machine may trench to the correct depth. Topsoil is to be stripped over a sufficient width that no subsoil will be deposited on top of the topsoil. Subsoil will then be removed to the required depth and piled separately. Upon completion, the topsoil will then be replaced to an even depth over the disturbed area. The cost for this work shall be included in his tender price.

C.4.3 Excavator

Where the use of an excavator is used in-lieu of a wheel machine, the topsoil shall be stripped and replaced in accordance with Item C.4.2. All tile shall be installed on 19mm clear crushed stone bedding placed to a minimum depth of 150mm which has been shaped to conform to the bottom of the pipe. The Contractor shall include the costs of this work in his tender price.

C.5 INSTALLATION

C.5.1 Concrete Tile

The tile is to be laid with close joints and in regular grade and alignment in accordance with the drawings. The tiles are to be bevelled, if necessary to ensure close joints. The inside of the tile is to be kept clear when laid. The sides of the tile are to be supported by partial filling of the trench

(blinding) prior to inspection by the Engineer. No tile shall be backfilled until inspected by the Engineer unless otherwise permitted by the Engineer. The tile shall be backfilled such that a sufficient mound of backfill is placed over the trench to ensure that no depression remains after settling occurs in the backfill.

Where a tile connects to a catch basin or similar structure, the Contractor shall include in his tender price for the supply and placement of compacted Granular 'A' bedding or 19mm clear crushed stone under areas backfilled from the underside of the pipe to undisturbed soil. Where a tile drain passes through a bore pit, the Contractor shall include in his tender price for the supply and placement of compacted Granular 'A' bedding or 19mm clear crushed stone from the underside of the pipe down to undisturbed soil with the limits of the bore pit.

The Contractor shall supply and wrap all concrete tile joints with Mirafi 160N geotextile filter material as part of this contract. The width of the filter material should be:

- 300mm wide for tile sizes 150mm diameter to 350mm diameter.
- 400mm wide for tile sizes 400mm diameter to 750mm diameter.
- 500mm wide for tile sizes larger than 750mm diameter.

The filter material shall completely cover the tile joint and shall have a minimum overlap of 300mm. The type of filter material shall be.

C.5.2 HDPE Pipe

HDPE pipe shall be installed using compacted Granular 'A' bedding or 19mm clear crushed stone bedding from 150mm below the pipe to 300mm above the pipe. All granular material shall be compacted using a suitable mechanical vibratory compactor. Granular bedding and backfill shall be placed in lifts not exceeding 300mm and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD).

Where a pipe connects to a catch basin or similar structure, the Contractor shall include in his tender price for the supply and placement of compacted Granular 'A' bedding or 19mm clear crushed stone under areas backfilled from the underside of the pipe to undisturbed soil. Where a pipe passes through a bore pit, the Contractor shall include in his tender price for the supply and placement of compacted Granular 'A' bedding or 19mm clear crushed stone from the underside of the pipe down to undisturbed soil with the limits of the bore pit.

As determined by the Engineer, unsuitable backfill material must be hauled off-site by the Contractor and Granular "B" shall be used as replacement backfill material.

C.6 TRENCH CROSSINGS

The Contractor shall not cross the backfilled trench with any construction equipment or vehicles, except by one designated crossing location on each property. The Contractor shall ensure that the bedding and backfill material at this designated crossing location is properly placed and compacted so as to adequately support the equipment and vehicles that may cross the trench.

The Contractor may undertake any other approved work to ensure the integrity of the tile at the crossing location. The Contractor shall ensure that no equipment or vehicles travel along the length of the trench. The Contractor shall be responsible for any damage to the new tile caused by the construction of the drain.

C.7 OUTLET PROTECTION

A tile drain outlet into a ditch shall be either HDPE pipe or corrugated steel pipe and shall include a hinged grate for rodent protection. The maximum spacing between bars on the rodent grate shall be 40mm. All corrugated steel outlet pipes shall be bevelled at the end to generally conform to the slope of the ditch bank.

Quarry stone rock rip-rap protection and geotextile filter material (Mirafi 160N), shall be installed around the outlet pipe and extended downstream a minimum distance of three metres, unless otherwise specified. The protection shall extend to the top of the backfilled trench and below the pipe to 300 mm under the streambed. The protection shall also extend 600mm into undisturbed soil on either side of the backfilled trench. In some locations, rip-rap may be required on the bank opposite the outlet.

Where the outlet occurs at the upper end of an open ditch, the rip-rap protection will extend all around the end of the ditch and to a point 800mm downstream on either side. Where heavy overflow is likely to occur, sufficient additional rip-rap and filter material shall be placed as directed by the Engineer to prevent the water cutting around the protection.

C.8 CATCH BASINS AND JUNCTION BOXES

Unless otherwise noted, catch basins shall be in accordance with OPSD 705.010 and 705.030. The catch basin grate shall be a “Birdcage” type substantial steel grate, removable for cleaning and shall be inset into a recess provided around the top of the structure. The grate shall be fastened to the catch basin with bolts into the concrete. Spacing of bars on grates for use on 600mmX600mm structures shall be 65mm centre to centre. Spacing of bars on grates for use on structures larger than 600mmX600mm shall be 90mm.

All catch basins shall be backfilled with compacted Granular ‘A’ or 19mm clear crushed stone placed to a minimum width of 300mm on all sides. If settling occurs after construction, the Contractor shall supply and place sufficient granular material to maintain the backfill level flush with adjacent ground. The riser sections of the catch basin shall be wrapped with filter cloth.

Quarry stone rip-rap protection shall be placed around all catch basins and shall extend a minimum distance of one (1) metre away from the outer edge of each side of the catch basin, and shall be placed so that the finished surface of the rip-rap is flush with the existing ground.

If there are no existing drains to be connected to the catch basin at the top end of the drain, a plugged tile shall be placed in the upstream wall with the same elevations as the outlet tile.

Junction boxes shall have a minimum cover over the lid of 450mm.

The Contractor shall include in his tender price for the construction of a berm behind all ditch inlet structures. The berm shall be constructed of compacted clay keyed 300mm into undisturbed soil. The top of the spill way of the earth berm shall be the same elevation as the high wall of the ditch inlet catch basin. The earth berm shall be covered with 100mm depth of topsoil and seeded with an approved green seed mixture. The Contractor shall also include for regrading, shaping and seeding of road ditches for a maximum of 15 metres each way from all catch basins.

The Contractor shall clean all catch basin sumps after completion of the drain installation. Catch basin markers shall be placed beside each catch basin.

C.9 TRIBUTARY DRAINS

Any tributary tile encountered in the course of the drain is to be carefully taken up by the Contractor and placed clear of the excavated earth. If the tributary drains encountered are clean or reasonably clean, they shall be connected into the new drain in accordance with the typical tile drain connection detail. Tributary tile drain connections into the new drain shall be made using high density polyethylene agricultural drain tubing installed on and backfilled with 19mm clear crushed stone. All tile drain connections into the new drain shall be either a cored hole with an insert coupler or a manufactured tee.

Where the existing drains are full of sediment, the decision to connect the tributary drain to the new drain shall be left to the Engineer. The Contractor shall be paid for each tributary drain connection as outlined in the Form of Tender and Agreement.

The Contractor shall be responsible for all tributary tile connections for a period of one year from the date of the Completion Certificate. After construction, any missed tile connections required to be made into the new drain shall be paid at the same rate as defined in the Form of Tender and Agreement. The Contractor will have the option to make any subsequent tile connections or have the Municipality make the required connections and have the cost of which deducted from the holdback.

Where an open ditch is being replaced by a new tile drain, existing tile outlets entering the ditch from the side opposite the new drain shall be extended to the new drain.

Where the Contractor is required to connect an existing tile which is not encountered in the course of the drain, the cost of such work shall constitute an extra to the contract.

C.10 CLEARING, GRUBBING AND MULCHING

The Contractor shall clear, brush and stump trees from within the working area.

All trees or limbs 150mm or larger, that is necessary to remove, shall be cut, trimmed and neatly stacked in the working width for the use or disposal by the Landowner. Brush and limbs less than 150mm in diameter shall be mulched.

Clearing, grubbing and mulching shall be carried out as a separate operation from installing the drain, and shall not be completed simultaneously at the same location.

C.11 ROADS AND LANEWAY SUB-SURFACE CROSSINGS

All roads and laneway crossings may be made with an open cut. The Contractor may use original ground as backfill to within 600mm of finished grade only if adequate compaction and if the use of the original ground backfill has been approved beforehand by the Engineer.

C.12 FILLING IN EXISTING DITCHES

The Contractor shall backfill the ditch sufficiently for traversing by farm equipment. If sufficient material is available on-site to fill in the existing ditch, the topsoil shall be stripped and the subsoil shall be bulldozed into the ditch and the topsoil shall then be spread over the backfilled waterway. The Contractor shall ensure sufficient compaction of the backfill and if required, repair excess settlement up to the end of the warranty period.

C.13 CONSTRUCTION OF GRASSED WATERWAYS

Where the Contractor is required to construct a grassed waterway, the existing waterway shall be filled in, regraded, shaped and a seed bed prepared prior to applying the grass seed. The grass seed shall be fresh, clean and new crop seed, meeting the requirements of the MTO.

- 55% Creeping Red Fescue
- 15% Perennial Rye Grass
- 27% Kentucky Bluegrass
- 3% White Clover

Grass seed shall be applied at the rate of 100 kg/ha.

C.14 UNSTABLE SOIL

The Contractor shall immediately contact the Engineer if unstable soil is encountered. The Engineer shall, after consultation with the Contractor, determine the action necessary and a price for additions or deletions shall be agreed upon prior to further drain installation.

C.15 ROCKS

The Contractor shall immediately contact the Engineer if boulders of sufficient size and number are encountered such that the Contractor cannot continue trenching with a wheel machine. The Engineer shall determine the action necessary and a price for additions or deletions shall be agreed upon prior to further drain installation.

If only scattered large stone or boulders are removed on any project, the Contractor shall either excavate a hole to bury same adjacent to the drain, or he shall haul the stones or boulders to a location designated by the Landowner.

C.16 BROKEN OR DAMAGED TILE

The Contractor shall remove and dispose of all broken (existing or new), damaged or excess tile off site.

C.17 RECOMMENDED PRACTICE FOR CONSTRUCTION OF SUBSURFACE DRAINAGE SYSTEMS

Drainage Guide for Ontario, Ministry of Agriculture, Food and Rural Affairs, Publication 29 and its amendments, dealing with the construction of Subsurface Drainage Systems, shall be the guide to all methods and materials to be used in the construction of tile drains except where superseded by other Specifications of the Contract.

DIVISION H
SPECIAL PROVISIONS

DIVISION H
SPECIAL PROVISIONS

Lang Municipal Drain 2018
Municipality of Brockton **Reference No. 1631**

Special provisions means special directions containing requirements peculiar to the work not adequately provided for by the standard or supplemental Specifications. Special provisions shall take precedence and govern any standard or supplemental Specifications.

H.1 GENERAL

The Contractor shall notify the Landowners, the Drainage Superintendent (Mr. Stephen Cobine, P.Eng.), Works Supervisor (John Strader) and the Engineer forty-eight (48) hours prior to construction.

The Contractor shall verify the location of the new drainage system with the Landowners and the Engineer prior to construction.

The Contractor shall check and verify all dimensions and elevations and report any discrepancies to the Engineer prior to proceeding with the work.

All objects or obstructions within the construction working area such as signs, mailboxes, fences, property ornamentals, etc., that interfere with the installation of the drain shall be removed and re-erected in the same location or another location satisfactory to the Landowner. Any damages to such objects by the Contractor shall be repaired, replaced, installed and paid for by the Contractor at the discretion of the Engineer.

The Contractor shall be responsible to arrange all traffic control signals, signs and devices that are required for safe and proper traffic management during the installation of the drainage system. The Contractor shall contact the Municipality of Brockton for specified local procedures, guidelines and timelines. Traffic control shall meet the standards of Book 7 of the Ontario Traffic Manual.

The Contractor shall be responsible for notifying all applicable emergency services, schools, etc. of any road closures or construction taking place unless otherwise stated by the Municipality of Brockton.

The Contractor shall maintain access for all emergency vehicles at all times during construction.

The Contractor shall comply with the Highway Traffic Act, Load Restrictions of 5 tonnes per axle on posted roads that is in effect annually from March 1 to April 30.

H.2 UTILITIES

All utilities shall be located and uncovered in the affected areas by the Contractor prior to construction.

The Contractor shall arrange to have a representative of the utility owner on site during construction if it is a requirement by the utility owner.

H.3 WORKING AREA AND ACCESS

H.3.1 Open Work

The working area for construction purposes from Sta. 0+000 to Sta. 0+330 shall be a width of 12 metres on the south side of the drain.

The working area for maintenance purposes shall be a width of ten (10) metres on the south side of the drain. Each landowner shall designate access to and from the working area.

H.3.2 Closed Work

The working area for construction purposes shall be a width of thirty (30) metres except from Main Drain Sta. 1+239 to Sta. 1+438 where the working area for construction purposes shall be twenty-five (25) metres.

The working area for construction purposes to fill in the existing private open ditch on the G. Lang property shall be a width of fifteen (15) metres.

The working area for maintenance purposes shall be a width of ten (10) metres centered on the proposed tile drain. Each landowner on whose property the drainage work is to be constructed shall designate access to and from the working area.

H.4 CLEARING, GRUBBING AND MULCHING

The Contractor shall clear, brush and stump trees from within the working area that interfere with the installation of the drainage system.

All trees, limbs and brush less than 150mm in diameter shall be mulched. Trees greater than 150mm in diameter shall be cut in lengths no longer than 4 metres and placed in piles designated by the Landowners in accordance with the detail on Drawing 3 of 3 in the set of plans.

H.5 PLUNGE POOL

The Contractor shall construct a plunge pool in the Main Drain (Open) from Sta. 0+330 to Sta. 0+320. The plunge pool shall be lined with quarry-stone rip rap protection 150mm to 300mm in diameter placed 450mm deep and placed 1m up the side slopes of the ditch and around the new outlet pipes. The rip-rap shall be placed on an approved geotextile filter material (Mirafi 160N or approved equivalent).

The plunge pool shall be constructed in accordance with the Plunge Pool Detail on Drawing 3 of 3 in the set of plans.

H.6 TOPSOIL/STRIPPING

For the installation of the tile drainage systems, the Contractor shall strip the topsoil for a width of 15 metres along the proposed tile drains in accordance with the Typical Working Corridor Detail on Drawing 2 of 3.

If the topsoil is greater than 300mm in depth, the Contractor:

- Shall be responsible for the stripping of the top 300mm depth for the full specified width
- Shall be responsible for the stripping of the entire depth of topsoil for the full top width of trench
- May elect to leave remaining depth of topsoil undisturbed
- Shall make every reasonable effort to prevent the contamination of topsoil and subsoil

The Contractor shall stockpile the topsoil within the working corridor and later spread it over the backfilled trench using an approved trim dozer. At no time shall topsoil be stockpiled on subsoil or subsoil be stockpiled on topsoil.

H.7 FILLING IN EXISTING OPEN DITCHES

The Contractor shall strip any available topsoil from the existing open ditch on the G. Lang property before filling them in. Topsoil shall be stockpiled on native undisturbed topsoil within the working corridor and shall at no time be placed on subsoil. Topsoil shall later be spread over the backfilled ditches and final grading shall be done using a trim dozer.

The Contractor shall use approved excess subsoil from the tile drain installation as fill material. Approved excess native material from the installation of the tile drains shall also be used as fill. All remaining excess excavated material after the existing open ditches have been filled in shall be hauled off-site by the Contractor.

The Contractor shall also use subsoil from the designated fill site on the G. Lang property to fill in the existing open ditch. The Contractor shall strip the topsoil from the designated fill site and stockpile the topsoil on topsoil, prior to stripping the subsoil. The topsoil shall later be spread back over the designated fill site.

The Contractor shall strip the required amount of subsoil from the designated fill site in such a manner

H.8 RIP-RAP

All stone rip-rap material shall be quarry stone 150 mm to 300 mm dia. and placed to a depth of 450 mm. All rip-rap material shall be placed on geo-textile filter material (Mirafi 160N).

H.9 EXISTING DRAINS/TILE CONNECTIONS

The Contractor shall make all tributary tile drain connections in accordance with the Typical Tile Connection Detail on Drawing 3 of 3 in the attached set of plans.

The Contractor shall be responsible for all tile connections for a period of one year after the issuance of the completion certificate. The tile connections required to be made within this warranty period shall be made at the same rate as defined on the Form of Tender and Agreement. After construction, the Contractor will be given the option to make any subsequent tile connections or have the Municipality make said connections and have the costs of which deducted from the holdback.

The Contractor shall supply all necessary materials to complete the connections of the existing drains to the new drain. The type of materials used to make the tributary drain connections shall be verified with the Engineer.

All existing drains cut off during the installation of the new drainage system that will be connected to the new drainage system shall be flagged or marked by the Contractor prior to the connection being made.

H.10 PIPE, INSTALLATION, BEDDING & BACKFILL

H.10.1 Concrete Field Tile

An approved wheel trencher shall be used to install the concrete field tile.

All concrete tile with diameters less than 600mm shall be Heavy-Duty Extra Quality Concrete Drain Tile 1500D. All concrete tile with diameters 600mm or greater shall be Heavy-Duty Extra Quality Concrete Drain Tile 2400D.

Concrete field tile installed by means of a wheel machine shall be backfilled using suitable native material. The backfill shall not be compacted but a sufficient mound shall be left over the trench by the Contractor to allow for settlement flush with adjacent lands.

Concrete field tile installed by means of an approved hydraulic excavator shall be installed using 19mm (3/4”) crushed stone bedding from 150mm below the pipe to the spring line of the pipe. Optionally, the Contractor may use pea gravel backfill after the 150mm of crushed stone bedding to the spring line of the pipe. Suitable native material shall be used as backfill from the spring line to the underside of the topsoil.

The Contractor shall install the two runs of 675mm diameter concrete field tile on the Main Drain (Closed) 300mm apart from Sta. 0+336 to Sta. 0+470, as shown on the “Installation Detail Sta. 0+330 to 0+470” on Drawing 2 of 3 in the set of plans.

All approved excess material from the installation of the Main Drain (Closed) shall be used to fill in the existing open ditch on the G. Lang property.

The Contractor shall supply and wrap all concrete tile joints with geotextile filter material as part of this contract. The width and overlap of the filter material should be:

- 300mm wide & 300mm overlap for tile sizes 150mm diameter to 350mm diameter.
- 400mm wide & 400mm overlap for tile sizes 400mm diameter to 600mm diameter.
- 500mm wide & 500mm overlap for tile sizes larger than 600mm diameter.

The filter material shall completely cover the tile joint and shall have a minimum overlap as outlined above. The type of filter material shall be Mirafi 140NC for clay or loam soil conditions and Mirafi 160N for sandy or silty soil conditions.

The Contractor shall be responsible for all trench settlement.

Any modifications to the ‘Typical Drain Installation On Wrapped Stone Bedding Detail” shall be at the sole discretion of the engineer.

H.10.2 High Density Polyethylene Pipe (H.D.P.E.)

An approved hydraulic excavator shall be used for the installation of all H.D.P.E. pipe.

All H.D.P.E. pipe shall be BOSS 2000 (or equivalent) CSA B182.8-02/320 KPa.

All H.D.P.E. solid pipe shall have split coupler soil tight joining systems except through the Concession 4 East road allowance on the Main Drain (Closed) from Sta. 1+219 to Sta. 1+239 where the H.D.P.E. pipe shall have bell and spigot water tight joining systems.

All H.D.P.E. pipe shall be installed using 19mm (3/4”) crushed stone bedding from 150mm below the pipe to 300mm above the pipe. Suitable native material shall be used as backfill from 300mm above the pipe to the underside of the topsoil. Optionally, the Contractor may use pea gravel backfill after the 150mm of crushed stone bedding to 300mm above the pipe.

The Contractor shall install the two runs of 750mm diameter H.D.P.E. pipe on the Main Drain (Closed) 300mm apart from Sta. 0+330 to Sta. 0+336, as shown on the “Installation Detail Sta. 0+330 to 0+470” on Drawing 2 of 3 in the set of plans.

The backfill shall not be compacted but a sufficient mound shall be left over the trench by the Contractor to allow for settlement flush with adjacent lands.

The Contractor shall be responsible for all trench settlement.

H.11 CATCH BASINS

All catch basins shall be precast concrete catch basins (Coldstream Concrete Ltd. or approved equal).

All existing catch basins and hickenbottoms to be removed shall be disposed of off-site by the Contractor.

All catch basins to have 300mm sumps.

The catch basin grate elevations shall be set to the satisfaction of the Engineer.

All catch basin grates shall be fastened to the new catch basins.

All catch basins shall have hot dipped galvanized bird cage grates as per Coldstream Concrete Ltd. (or approved equal).

Knockouts shall be provided in all catch basins.

All catch basins shall be installed using 19mm (3/4") crushed stone bedding from 150mm below the structure to 300mm above the top of the highest pipe entering or exiting the structure. See the "Catch Basin Installation Detail" on Drawing 3 of 3 in the set of plans.

The Contractor shall place quarry stone rip-rap material around all sides of all catch basins for a minimum width of 1 metre and shall be placed on an approved geo-textile filter material.

Lifts (modulocs) shall be placed by the Contractor on all catch basins if necessary to achieve the desired elevation when field setting the structures.

The Contractor shall be responsible to repair or reapply grout for all grouted connections into any catch basin for a period of one year after the completion certificate has been issued.

The Contractor shall be responsible for all settlement around the catch basins. Should the area around the catch basins settle after construction, the Contractor shall be responsible for providing the additional rip-rap required so that the top of the rip-rap is flush with the surrounding existing ground.

All pipes entering or exiting a catch basin, ditch inlet catch basin or junction box shall be installed such that the face of the pipe is flush with the inside wall of the structure.

H.12 SEEDING

The Contractor shall supply and spread an approved seed mixture over the disturbed areas within the road allowances.

All seed shall be applied by means of hand seeding using the seed manufacturers application recommendations.

from the sediment control basin shall be hauled off-site by the Contractor.

H.13 CONCESSION 4 EAST ROAD CROSSING

The Contractor shall notify the Engineer and local road authority having jurisdiction over the road a minimum of forty-eight (48) hours prior to the installation of the crossing.

The existing 500mm diameter C.M.P. surface culvert shall be removed and disposed of off-site by the Contractor.

The Contractor shall install the 525mm dia. H.D.P.E. pipe through Concession 4 East by means of an approved hydraulic excavator using the open cut method.

All H.D.P.E. pipe installed within the Concession 4 East road allowance shall be BOSS 2000 (or equivalent) CSA B182.8-02/320 KPa with bell and spigot water tight joining systems.

The Contractor shall install the 525mm diameter H.D.P.E. pipe using Granular “A” bedding from 150mm below the pipe to 300mm above the top of the new 450mm diameter H.D.P.E. road culvert. Granular “B” material shall be used for backfill from 300mm above the new culvert to 250mm below finished grade. The Contractor may use suitable native material as backfill in lieu of Granular “B” if prior authorization is provided by the local road authority.

The Contractor shall place 200mm of Granular “A" from the top of the Granular “B” to the underside of the asphalt.

All granular materials shall be placed equally and simultaneously on both sides of the pipe in lifts not exceeding 300mm.

All catch basin inlet structures installed within the road allowance shall be placed on either Granular “A” bedding or 19mm (3/4”) crushed stone from 150mm below the structure to 300mm above the top of the highest pipe entering or exiting the structure. Suitable native material shall be used as backfill from the top of the Granular “A” or crushed stone to the underside of the topsoil.

The Contractor shall place quarry stone rip-rap material around all sides of all catch basins for a minimum width of 1 metre and shall be placed on an approved geo-textile filter material.

All granular materials used as bedding and backfill within the road allowance shall be thoroughly compacted to at least 95% Standard Proctor using an approved vibratory compactor.

The Contractor shall be responsible for all trench settlement and settlement around catch basins.

MUNICIPALITY OF BROCKTON
(FORMER TOWNSHIP OF GREENOCK)
COUNTY OF BRUCE

LOT 12 | LOT 11 | LOT 10 | LOT 9 | LOT 8 | LOT 7

CONCESSION 5 | CONCESSION 4

ERNEWEIN MUNICIPAL DRAIN

LORNE BESTER & SONS LUMBER (2–053)

W. PHILLIPPI (2–052)

A. & N. SPITZIG (2–050)

SEE DETAIL 1

1+239 N.R.L. D.I.C.B.

1+341 C.B.

1+438 R. C.B.

350mm

1+219 S.R.L. D.I.C.B.

B.M. 5 ELEV.= 278.97

J.B.

450mm

BRANCH 'B'

CONCESSION ROAD 4 EAST

0+194 R C.B.

1+203 MAIN = 0+000 BR. 'B'

MAIN 600mm DRAIN (CLOSED)

675mm

J. STEFFLER (2–020–50)

UNEVALUATED WETLAND

BRANCH 3

ERNEWEIN FARMS LTD. (2–015)

EXISTING OPEN DITCH TO BE FILLED

DESIGNATED FILL SITE

B.M. 3 ELEV.= 278.44

N. & B. REDFORD (2–019)

A. ERNEWEIN (2–017)

SUBSURFACE WATERS DRAINED TO ERNEWEIN DRAIN (APPROX. 1.3 Ha.)

J. VEENHOF (2–024)

B.M. 2 ELEV.= 280.04

0+792 45° ELBOW

750mm

J.B.

0+711 MAIN = 0+000 BR. 'A'

825mm

0+470 J.B.

2–675mm

0+357 E.R.L. C.B.

0+336 W.R.L

0+192 (OPEN)

B.M. 1 ELEV.= 277.48

MAIN DRAIN

0+000 R

B.M. 4 ELEV.= 282.55

G. LANG (2–020)

300mm

BRANCH 'A'

250mm

0+457 R C.B.

SUBSURFACE WATERS DRAINED TO ERNEWEIN DRAIN (APPROX. 6.7 Ha.)

× 278.64

× 277.52

× 278.60

CHEPSTOW SWAMP

SAUGEEN VALLEY CONSERVATION AUTHORITY (2–025)

PLAN

PLAN SCALE

0 100 200 300 400m

NOTES:

1. ALL SOLID HIGH DENSITY POLYETHYLENE PIPE SHALL BE BELL & SPIGOT CSA B182.8 UNLESS OTHERWISE NOTED.

BENCHMARK No. 1 ELEV.=277.48
NAIL IN SOUTH FACE OF 225mm DIA. TREE 6 METRES NORTH OF STA. 0+067 (MAIN OPEN).

BENCHMARK No. 2 ELEV.=280.04
NAIL IN SOUTH FACE OF 200mm DIA. TREE 36 METRES NORTH OF STA. 0+328 (MAIN OPEN)

BENCHMARK No. 3 ELEV.=278.44
TOP CENTRE UPSTREAM END OF 900mm C.M.P. CULVERT 60 METRES NORTH OF STA. 0+587 (MAIN CLOSED)

BENCHMARK No. 4 ELEV.=282.55
TOP CENTRE OF IRON BAR 190 METRES east OF STA. 0+1780 (MAIN CLOSED)

BENCHMARK No. 5 ELEV.=278.97
TOP CENTRE UPSTREAM END OF 400mm C.M.P. CULVERT 17 METRES WEST OF STA. 1+219 (MAIN CLOSED)

LEGEND:

- DRAIN NAME — EXISTING MUNICIPAL DRAIN
- INTERIOR/EXTERIOR WATERSHED BOUNDARY
- PROPERTY BOUNDARY
- LOT OR CONCESSION BOUNDARY
- TOWNSHIP BOUNDARY
- EXISTING CATCH BASIN OR JUNCTION BOX
- EXISTING MANHOLE
- EXISTING WETLAND
- DRAIN NAME — MUNICIPAL DRAIN (AREA OF WORK)
- WATERSHED BOUNDARY
- PROPOSED CATCH BASIN OR JUNCTION BOX
- PROPOSED MANHOLE
- BENCHMARK LOCATION — B.M. 1 ELEV.= 50.00 — BENCHMARK No. / BENCHMARK ELEVATION

No.	ISSUES AND REVISIONS	DATE	BY
5.	ISSUED FOR TENDER	2019–02–01	DEL
4.	REPORT SUBMISSION	2018–06–14	DEL
3.	D.F.O. SUBMISSION	2018–02–09	DEL
2.	INFORMATION MEETING	2017–04–12	DEL
1.	ON–SITE MEETING	2016–08–05	DEL

REGISTERED PROFESSIONAL ENGINEER W. J. DIETRICH PROVINCE OF ONTARIO

BROCKTON ESTABLISHED 1998

PROJECT:
LANG MUNICIPAL DRAIN 2018

DRAWING:
Plan

DIETRICH ENGINEERING LIMITED
CONSULTING ENGINEERS
10 Alpine Court, Kitchener, ON, N2E 2M7

PROJ. MGR: G.N.	DESIGNED BY: M.T.	DRAWN BY: A.H.	CHECKED BY: G.N.
DRAWING SCALE: AS NOTED	DATE: JUNE 14, 2018	PROJECT No. 1631	DRAWING No. 1 of 3

BOTTOM WIDTH

0.9m

SIDE SLOPES

2:1

TILE SIZES

MAIN DRAIN

No.	ITEM	SIZE (mm)	STATION	LENGTH (m)
1.	HIGH DENSITY POLYETHYLENE OUTLET PIPE	2–750	0+330 – 0+336	12
2.	CONCRETE FIELD TILE	2–675	0+336 – 0+470	268
3.	CONCRETE FIELD TILE	825	0+470 – 0+711	241
4.	CONCRETE FIELD TILE	750	0+711 – 0+786	75
5.	HIGH DENSITY POLYETHYLENE PIPE	750	0+786 – 0+798	12
6.	CONCRETE FIELD TILE	675	0+798 – 0+921	123
7.	CONCRETE FIELD TILE	600	0+921 – 1+219	298
8.	HIGH DENSITY POLYETHYLENE PIPE	525	1+219 – 1+239	20
9.	HIGH DENSITY POLYETHYLENE PIPE	375	1+239 – 1+251	12
10.	CONCRETE FIELD TILE	350	1+251 – 1+329	78
11.	HIGH DENSITY POLYETHYLENE PIPE	375	1+329 – 1+341	12
12.	CONCRETE FIELD TILE	350	1+341 – 1+438	97

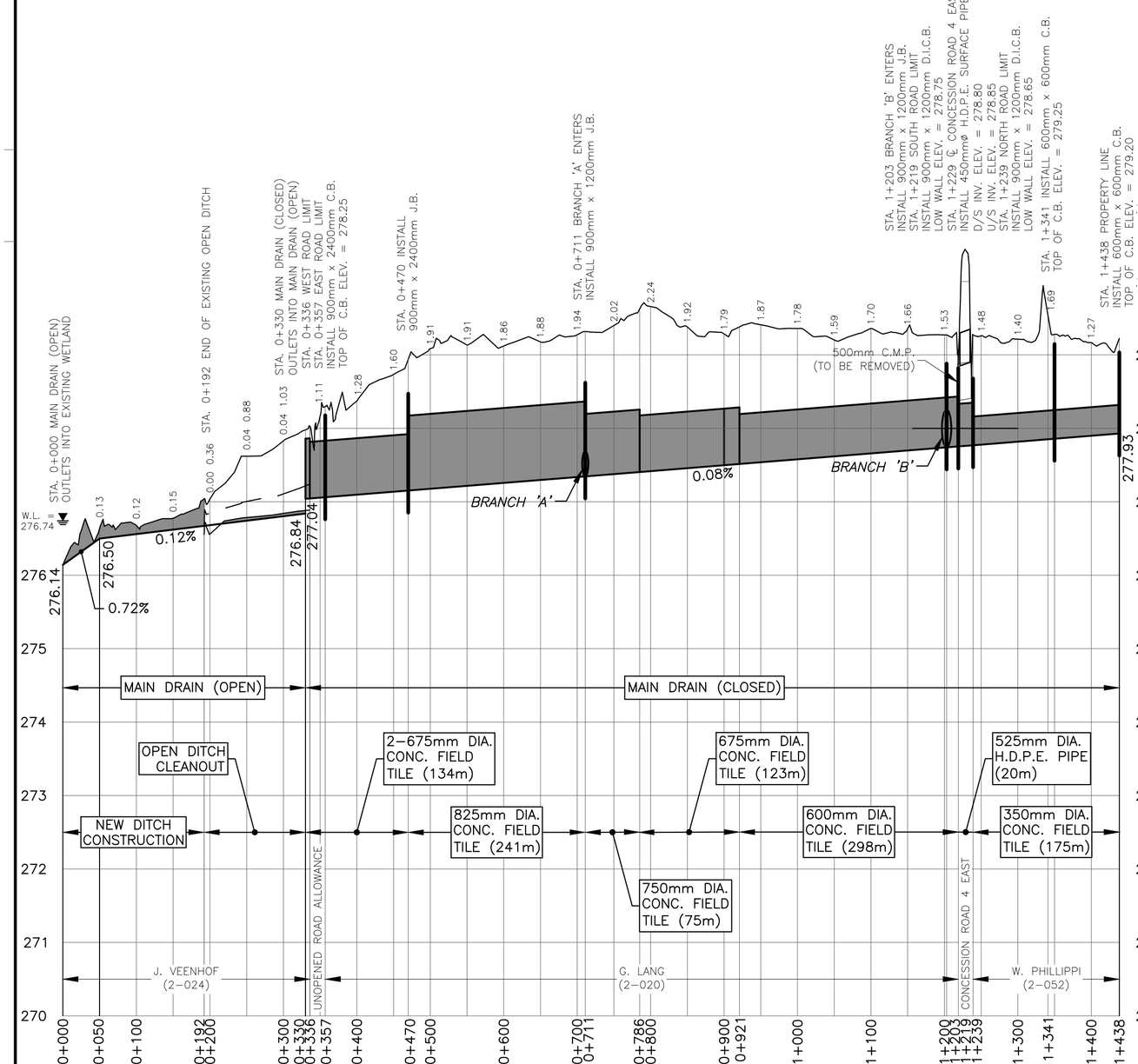
TILE SIZES

BRANCH A

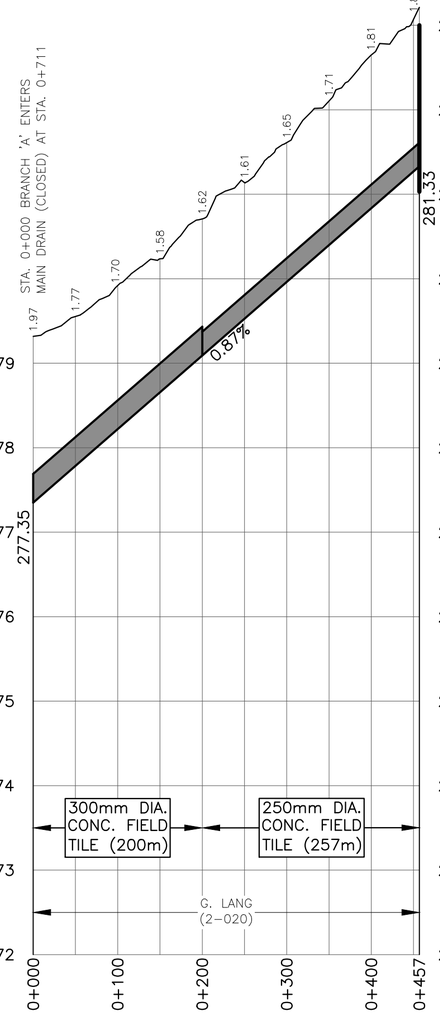
No.	ITEM	SIZE (mm)	STATION	LENGTH (m)
1.	CONCRETE FIELD TILE	300	0+000 – 0+200	200
2.	CONCRETE FIELD TILE	250	0+200 – 0+457	257

BRANCH B

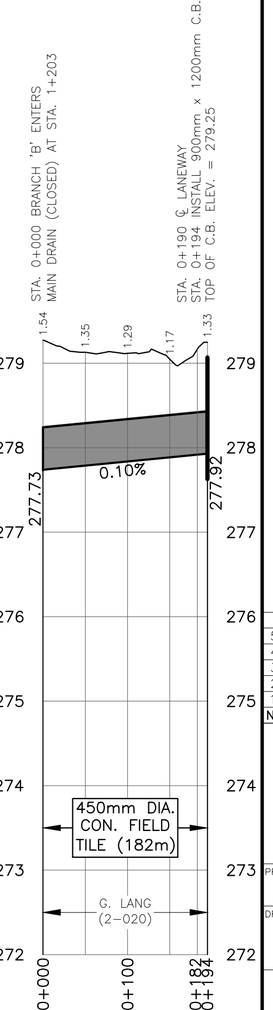
No.	ITEM	SIZE (mm)	STATION	LENGTH (m)
1.	CONCRETE FIELD TILE	450	0+000 – 0+182	182
2.	HIGH DENSITY POLYETHYLENE PIPE	450	0+182 – 0+194	12



MAIN DRAIN PROFILE



BRANCH 'A' PROFILE



BRANCH 'B' PROFILE

PROFILE SCALES

HORZ. 0 100 200 300 400m

VERT. 0 1 2 3 4m

NOTES:

1. ALL SOLID HIGH DENSITY POLYETHYLENE PIPE SHALL BE BELL & SPIGOT CSA B182.8 UNLESS OTHERWISE NOTED.

No.	ISSUES AND REVISIONS	DATE	BY
5.	ISSUED FOR TENDER	2019–02–01	DEL
4.	REPORT SUBMISSION	2018–06–14	DEL
3.	D.F.O. SUBMISSION	2018–02–09	DEL
2.	INFORMATION MEETING	2017–04–12	DEL
1.	ON–SITE MEETING	2016–08–05	DEL

REGISTERED PROFESSIONAL ENGINEER W. J. DIETRICH PROVINCE OF ONTARIO

BROCKTON ESTABLISHED 1998

PROJECT:

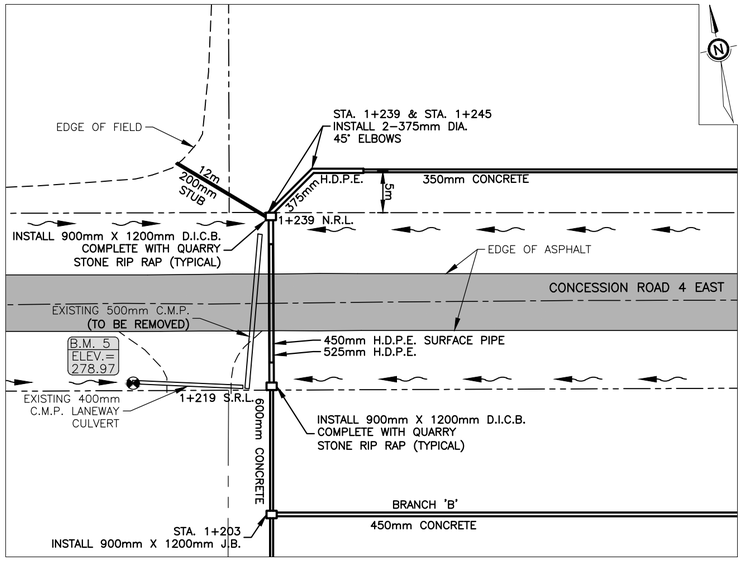
LANG MUNICIPAL DRAIN 2018

DRAWING:

Profiles

DIETRICH ENGINEERING LIMITED
CONSULTING ENGINEERS
10 Alpine Court, Kitchener, ON, N2E 2M7

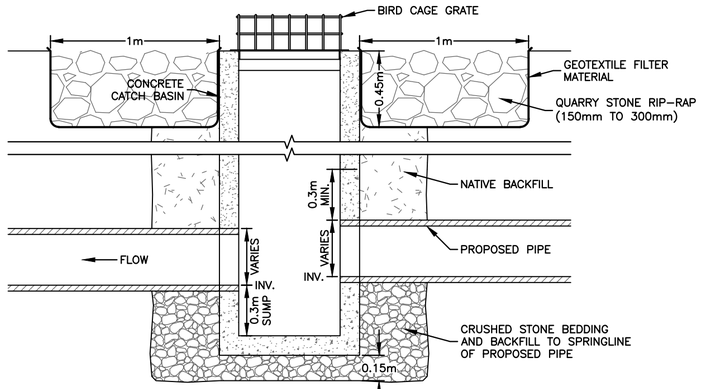
PROJ. MGR: G.N	DESIGNED BY: M.T.	DRAWN BY: A.H.	CHECKED BY: G.N.
DRAWING SCALE: AS NOTED	DATE: JUNE 14, 2018	PROJECT No. 1631	DRAWING No. 2 of 3



DETAIL 1: CONCESSION ROAD 4 EAST ROAD CROSSING

DETAIL SCALE

0 10 20 30 40m

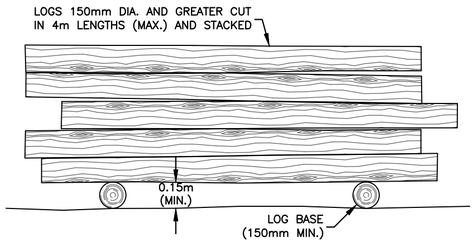


TYPICAL CATCH BASIN INSTALLATION DETAIL

N.T.S.

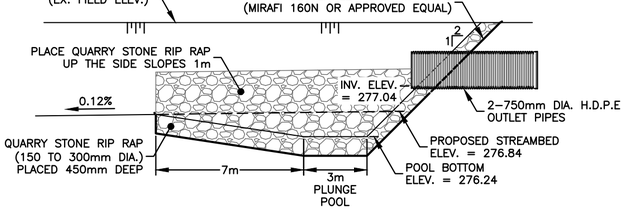
NOTES:

1. ALL SOLID HIGH DENSITY POLYETHYLENE PIPE SHALL BE BELL & SPIGOT CSA B182.8 UNLESS OTHERWISE NOTED.



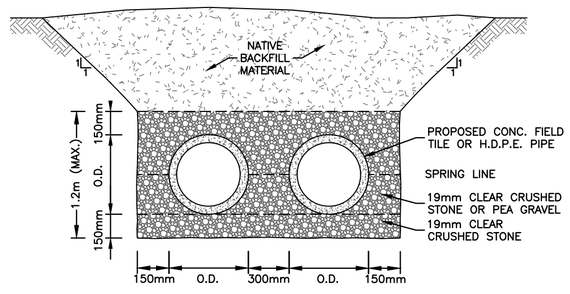
LOG PILING DETAIL

N.T.S.



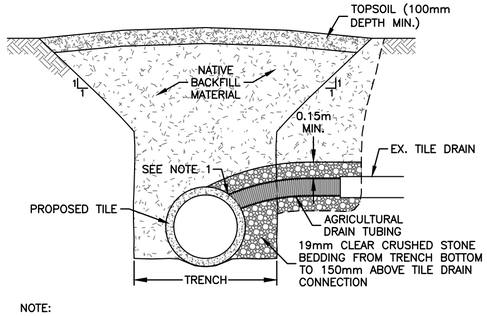
PLUNGE POOL DETAIL

N.T.S.



INSTALLATION DETAIL
STA. 0+330 - 0+470

N.T.S.

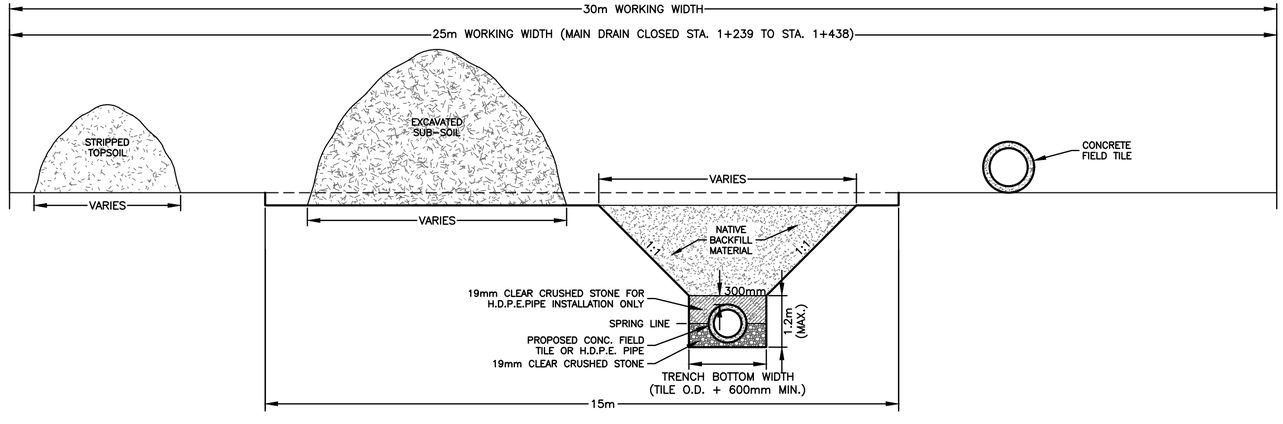


NOTE:

1. ALL TILE CONNECTIONS TO BE EITHER A CORED HOLE WITH AN INSERT COUPLER, OR A MANUFACTURED TEE.
2. CLEAR CRUSHED STONE BEDDING NOT REQUIRED IF DUAL WALL H.D.P.E. PIPE IS USED FOR THE CONNECTION.

TYPICAL TILE CONNECTION DETAIL

N.T.S.



TYPICAL WORKING CORRIDOR DETAIL

N.T.S.

No.	ISSUES AND REVISIONS	DATE	BY
5.	ISSUED FOR TENDER	2019-02-01	DEL
4.	REPORT SUBMISSION	2018-06-14	DEL
3.	D.F.O. SUBMISSION	2018-02-09	DEL
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1.	ON-SITE MEETING	2016-08-05	DEL

REGISTERED PROFESSIONAL ENGINEER
W. J. DIETRICH
PROVINCE OF ONTARIO

BROCKTON
ESTABLISHED 1998

PROJECT:

LANG MUNICIPAL DRAIN 2018

DRAWING:

Details

DIETRICH ENGINEERING LIMITED
CONSULTING ENGINEERS
10 Alpine Court, Kitchener, ON, N2E 2M7

PROJ. MGR: G.N.	DESIGNED BY: M.T.	DRAWN BY: A.H.	CHECKED BY: G.N.
DRAWING SCALE: AS NOTED	DATE: JUNE 14, 2018	PROJECT No. 1631	DRAWING No. 3 of 3