

# The Corporation of the Municipality of Brockton



## By-Law 2020-022

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Being a By-Law to Accept a Tender from Van Gorp Farm Drainage Limited for the Construction of the Russell Municipal Drain for the Municipality of Brockton.

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**Whereas** the Council for the Corporation of the Municipality of Brockton Council deems it expedient to accept a tender from Van Gorp Farm Drainage Limited for the construction of the Russell Municipal Drain for the Municipality of Brockton;

**Now Therefore** the Council of the Corporation of the Municipality of Brockton enacts as follows;

- 1.0 That the Council of the Corporation of the Municipality of Brockton hereby accepts the Tender of Van Gorp Farm Drainage Limited in the amount of \$56,504.00 plus H.S.T. for the construction of the Russell Municipal Drain as described in the attached Schedule "A" to this By-Law.
- 2.0 That the Mayor and Clerk are hereby authorized to sign on behalf of the Council for The Corporation of the Municipality of Brockton, any contracts and other documents required to authorize such purchase to proceed, and to affix the corporate seal of the Municipality of Brockton.
- 3.0 This By-Law shall come into full force and effect upon final passage.
- 4.0 This By-Law may be cited as the "Russell Municipal Drain Tender Acceptance By-Law".

**Read, Enacted, Signed and Sealed this 10th day of March, 2020.**

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Mayor – Chris Peabody

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Clerk – Fiona Hamilton

**BID FORM**

TO: **Municipality of Brockton**  
100 Scott Street, P.O. Box 68  
Walkerton, ON N0G 2V0  
  
Attention: **Fiona Hamilton, Clerk**

DATE: February 10, 2020

SUBMITTED BY: VAN GORP FARM DRAINAGE LTD  
"[Insert Bidder's Legal Name]"

ADDRESS: 12709 IMPERIAL ROAD, SPRINGFIELD, ON.  
"[Insert Bidder's Business Address]" N0L 2J0

PROJECT NAME: **Russell Municipal Drain**

CONTRACT NUMBER: **300038962.0000**

- 1.1 The undersigned (the "Bidder"), hereby declares that it has received and carefully examined all of the Bid Documents as set out in Section 3.1 of the Instructions to Bidders and has visited the Place of the Work and familiarized itself with all of the conditions affecting the Work as described in the Bid Documents with respect to Work and with all of the provisions of the Bid Documents including, without limitation, the form of the Contract. Without limiting the foregoing, the undersigned also acknowledges having received and carefully examined all of the following Addenda and having included all aspects thereof in their bid:

Addendum No.	Date	Included in Bid (✓)

(Notes: If no Addenda are issued then this table shall be left blank. It is not necessary to submit copies of each Addendum with the Bid.)

- 1.2 In accordance with, and subject to, the Contract (including, without limitation, GC 8.01.02), the Bidder hereby offers to perform and complete the Work (including, without limitation, furnishing all products, materials, construction machinery, tools, equipment, plant, labour, and supervision necessary for the proper completion of the Work and the contract security, permits, insurance and transportation) to attain Substantial Performance of the Work in accordance with the schedule contained in Document D of the Bid Documents, for the price bid ("Bid Price") of: the total of the amounts calculated by multiplying the actual measured and approved quantities by the applicable unit prices combined with the completed lump sum price components of the Work, all as set out in Appendix "G", as adjusted pursuant to the Contract.

The Bid Price includes, without limitation, all applicable federal and provincial sales taxes, excise taxes and other taxes, including the HST, customs and duties.

In addition, the Bidder shall confirm that the Bid Price/Estimated Contract Price is set out in Appendix "G".

- 1.3 The Bidder agrees that time is of the essence and, if this Bid is accepted by the Owner, the Bidder agrees that it shall immediately commence the Work, including all mobilization work and submit initial shop drawings.
- 1.4 The Bidder declares that it has visited and carefully examined the Place of the Work and the surrounding area in a reasonable and prudent manner and satisfied itself as to the scope and character of the Work and all conditions and information affecting the Work and how the Work is to be completed, including, without limitation, the nature and location of the Work, working areas, storage areas, local features including private property and utilities, access to and at the Place of the Work, weather conditions and any other factors which may influence the performance of the Work and/or the pricing of the Work.
- 1.5 The Bidder is responsible for each Subcontractor's solvency, the contents of each Subcontractor's bid and for each Subcontractor's obligations as contemplated pursuant to the Bid Documents.
- 1.6 The Bidder represents and warrants that each of the Subcontractors set out in Appendix "B" is reliable and competent to carry out the Work in accordance with the Bid Documents, that the Bidder has consulted with each of the listed Subcontractors and has ascertained to the Bidder's complete satisfaction that they are fully acquainted with the extent and nature of the work involved, and of the requirements of the construction schedule, and that all such Subcontractors shall execute the Work to conform to the requirements of the Bid Documents and the construction schedule. If awarded the Contract, the Bidder shall only employ the Subcontractors set out in Appendix "B", as approved by the Owner, for the Work.

- 1.7 This Bid shall remain firm and irrevocable and open for acceptance by the Owner at any time for sixty (60) days after the Bid Closing Time, whether or not, any other Bid has been previously accepted by the Owner. This Bid shall expire upon written notice of rejection to the Bidder by the Owner or sixty (60) days after the Bid Closing Time, whichever first occurs.
- 1.8 We enclose herewith the Security, on the understanding that, without prejudice to any other right or remedy which may be available to the Owner, the Security may be used to compensate the Owner for any damages, costs or expenses that the Owner may incur as a result of the Bidder's failure to comply with, or breach of, the Bid or Bid process described in these Instructions to Bidders (including, without limitation, in the event that the Bidder attempts to withdraw its Bid prior to the expiry of sixty (60) days from the Bid Closing Time, or in the event that the Owner accepts the Bidder's Bid and the Bidder refuses or fails to sign the Contract or otherwise honour the Bid).
- 1.9 It is understood that all prices quoted in this Bid are in Canadian funds.
- 1.10 If notified in writing by the Owner (or Owner's agent) of acceptance of this Bid within sixty (60) days of the Bid Closing Time, we will execute the Contract within five (5) days of being presented by the Contract Administrator with the Contract for execution, while recognizing that upon the Acceptance the Contract will be formed and binding on the Owner and the Bidder, and furnish the Contract Security as specified in Section 10 of the Instructions to Bidders.

Without prejudice to any other right or remedy which may be available to the Owner, in the event that we do not execute the Contract within five (5) days of being presented by the Contract Administrator with the Contract for execution, the Owner may, in its discretion, accept any other Bid, request new bids or carry out the Work in any other way the Owner deems best, and the Security may be used to compensate the Owner for any damages, costs or expenses that the Owner may incur as a result of taking such action.

- 1.11 The following documentation comprising the Bid is enclosed:
- .1 This Bid Form;
  - .2 The Security (as defined in Section 10 of the Instructions to Bidders);
  - .3 Appendix "A" – List of Bid Documents;
  - .4 Appendix "B" – Subcontractors;
  - .5 Appendix "C" – Schedule;
  - .6 Appendix "D" – Residency;
  - .7 Appendix "E" – Proposed Alternatives to the Work;

- .8 Appendix "F" – List of Experience; and
- .9 Appendix "G" – Schedule of Unit Prices.
- 1.12 If this Bid is made by more than one person then each of the persons making this Bid agrees to be bound by it jointly and severally.
- 1.13 All capitalized terms used but not defined herein will have the definitions given to them in Document A – Instructions to Bidders.
- 1.14 The Bidder represents, warrants and covenants to the Owner that:
  - .1 All instructions and directions in the Bid Documents for the preparation and submission of this Bid have been complied with;
  - .2 This Bid is made without any connection, knowledge, comparison of figures or arrangement with any other person, corporation or other entity making another Bid for the Work and is, in all respects, fair and without collusion or fraud;
  - .3 No member of the municipal council of the Owner (as applicable) and no officer or employee of the Owner is, or will become interested directly or indirectly as a contracting party, partner, shareholder, security or otherwise, in the performance of the Contract, or in the supply of materials or services, work or business to which it relates, or in any portion of the profits thereof, or in any of the monies to be derived therefrom; and
  - .4 The Bidder agrees to be bound by the Bid Documents.

SIGNED BY THE BIDDER AS OF THE DATE FIRST WRITTEN ABOVE.

VAN GORP FARM DRAINAGE LTD  
FULL LEGAL COMPANY NAME

12709 IMPERIAL ROAD, SPRINGFIELD, ON. N0L 2J0  
ADDRESS OF COMPANY

President  
NAME/TITLE OF OFFICER

John Van Gorp  
SIGNATURE OF OFFICER  
AND COMPANY SEAL

519-521-9445  
TELEPHONE NUMBER

519-765-4730  
FAX NUMBER

mvr.vangorpdrainage@amtelecom.net  
EMAIL ADDRESS

**APPENDIX “A”**

**LIST OF BID DOCUMENTS**

The Bid Documents consist of:

- (a) Document A – Instructions to Bidders;
- (b) Document B – Bid (see Section 1.11 of Bid Form);
- (c) Document D – General Requirements;
- (d) the drawings and specifications listed in Document E (collectively, the “Drawings and Specifications”);
- (e) the Contract; and
- (f) all Addenda that were issued in writing by the Owner, or Contract Administrator, prior to the Bid Closing Time.

The following is a listing of Subcontractors who we propose to use.

<b>Division or Trade</b>	<b>Subcontractor</b>	<b>Approximate Value of Subcontract Work</b>
		-

**APPENDIX "C"**

**SCHEDULE**

- .1 In accordance with, and subject to, the Contract, the Bidder shall carry out the Work in accordance with the Completion Date contained in Document D, Subsection D.1.1 for the unit prices and lump sum prices set out in Appendix "G".
- .2 The Bidder submits the following alternative schedule for the Work and the applicable amount by which the unit prices and lump sum prices set out in Appendix "G" will be adjusted, for the Owner's consideration. If the Owner, in its sole and absolute discretion, accepts such alternative schedule for the Work, the Bidder's obligation to carry out the Work in accordance with the schedule contained in Document D and the unit prices and lump sum prices set out in Appendix "G" shall be both amended accordingly.

- (a) Alternative Schedule for the Work

Start June 15/20  
To  
July 15/20

- (b) Adjustment in the unit prices and lump sum prices set out in Appendix "G" (inclusive of all amounts including, without limitation, HST)

(Note: If the Bidder is not submitting an alternative schedule for the Work, then paragraphs (a) and (b) may be left blank.)



**APPENDIX “D”**

**RESIDENCY**

The Bidder ☒ **is** or ☐ **is not** a resident of Canada within the meaning of the Income Tax Act (Canada). Please check applicable description.

**APPENDIX “E”**

**PROPOSED ALTERNATIVES TO THE WORK (IF ANY)**

[See Section 7.3 of the Instructions to Bidders.]

APPENDIX "F"

LIST OF EXPERIENCE

\*Alternatively, the Contractor may provide their own list of experience including the same information.

Location	Owner's Consultant	Contact Name and Information	Description of Contract	Completion Date	\$ Value
Goodrich		County of Acon		Nov. 2019	\$35,300.00
Town of Minto	Marquardt Drainage			Aug. 2019	\$68,751.00
County of Wellington				Feb. 2018	32,460.00
Dorchester				Oct. 2018	\$33,000.00
Leamington				Jul. 2018	\$45,780.00

**APPENDIX “G”**  
**SCHEDULE OF UNIT PRICES**

**General Notes**

- i) Where alternative materials are listed, Bidders shall indicate a Unit Price for each alternative, but shall extend only the lowest Unit Price.

ii) **UNITS**

ea.	denotes	Each
ha	denotes	Hectare (10,000 m <sup>2</sup> = 2.471 Acres)
hrs	denotes	Hours
kPa	denotes	Kilopascal (1 kPa = 1,000 N/m <sup>2</sup> )
LS	denotes	Lump sum
mm	denotes	Linear millimetre
m	denotes	Linear metre
m <sup>2</sup>	denotes	Square metre
m <sup>3</sup>	denotes	Cubic metre (compacted or in situ)
t	denotes	Tonne (1,000 kg = 2,204.6 lbs.)

**ABBREVIATIONS**

BSWI	denotes	buried surface water inlet
CB	denotes	catchbasin (flat top inlet)
CDT	denotes	concrete drain tile
CSP	denotes	corrugated steel pipe
c/w	denotes	complete with
D. Berm	denotes	directional berm
dia.	denotes	diameter
DICB	denotes	ditch Inlet catchbasin (sloped top inlet)
E. Berm	denotes	engineered berm
HDPE	denotes	high density polyethylene (320 kPa dual-wall pipe)
PDT	denotes	plastic drainage tile (single-wall tubing)
OB	denotes	observation box (flat top, inspection only)
OPSD	denotes	Ontario Provincial Standard Drawing
OPSS	denotes	Ontario Provincial Standard Specification
ROW	denotes	right of way
S & I	denotes	supply and install
SP	denotes	special provision
Sta.	denotes	Station (chainage)
SWI	denotes	surface water inlet
SWWSP	denotes	smooth wall welded steel pipe

- iii) [All sections of the Schedule of Unit Prices must be completed **in full** and submitted as part of the Bid].

# SCHEDULE OF UNIT PRICES

**R. J. Burnside & Associates Limited**

**Project No. 300038962**

**Page No. 1**

**Contractor:** \*\*\*

**Address:** \*\*\*

**Contract Title:** Russell Municipal Drain

## SCHEDULE A - MAIN DRAIN

ITEM NO.	DESCRIPTION	CONTRACT QUANTITY	UNIT	UNIT PRICE	CONTRACT TOTAL
A1	Contractor Mobilization.	1.00	LS	2000.00	2000.00
	<b>Main Drain (Open Work)</b>				
A2 a)	Construction of approx. 20 m of channel. (Sta. -0+030 to Sta. -0+010)(SP A2)	1.00	LS	500.00	500.00
b)	Construction of one bio-filter sediment control structure at the downstream end of the channel construction (see accompanying details). (Sta. -0+030)(SP A2)	1.00	LS	1,000.00	1,000.00
c)	Construction of one sediment basin at the downstream end of the channel construction (see accompanying details). (Sta. -0+030 to Sta. -0+025)(SP A2)	1.00	LS	500.00	500.00
d)	Construction of one (1) stilling basin c/w approximately 10 m <sup>2</sup> river stone and 40 m <sup>2</sup> rip-rap c/w non-woven geotextile (see accompanying details). (Sta. -0+010 to Sta. 0+000)(SP A2)	1.00	LS	1880 -	1880.00
	<b>Main Drain (Closed Work)</b>				
A3	Supply and install 450 mm dia. solid bell and spigot dual-wall HDPE pipe (320 kPa) pipe c/w rodent grate (Approx. 6 m). (Sta. 0+000 to Sta. 0+006)(SP A3)	1.00	LS	500.00	500.00
A4	Supply and install 375 mm dia. Solid PDT installed by drainage plow (Approx. 79 m). (Sta. 0+006 to Sta. 0+085)(SP A4)	1.00	LS	4662.00	4662.00
A5	Supply and install 375 mm dia. solid PDT installed by drainage plow (Approx. 202 m). (Sta. 0+105 to Sta. 0+307)(SP A4)	1.00	LS	11,402.00	11,402.00
				<b>SUBTOTAL:</b>	<b>22444.00</b>

## SCHEDULE OF UNIT PRICES

**R. J. Burnside & Associates Limited**

**Project No. 300038962**

**Page No. 2**

**Contractor:**

\*\*\*

**Address:**

\*\*\*

**Contract Title:**

Russell Municipal Drain

### SCHEDULE A - MAIN DRAIN (continued)

ITEM NO.	DESCRIPTION	CONTRACT QUANTITY	UNIT	UNIT PRICE	CONTRACT TOTAL
	<u>Main Drain</u> <u>(Concession 2 South Durham Road ROW)</u> <u>(Sta. 0+085 to Sta. 0+105)</u>				
A6	Supply and install one (1) 600 mm x 600 mm offset concrete DICB c/w directional berm and 6 m - 250 mm dia. perforated dual-wall HDPE (320 kPa) pipe lead, complete with non-woven geotextile filter sock, connection to the OB, and 19 mm crushed stone envelope (per the accompanying details)(SP A6) (o/s 6 m east of Sta. 0+085)	1.00	LS	2,000	2,000. -
A7	Supply and install on (1) 600 mm x 600 mm inline concrete OB. (Sta. 0+085)(SP A7)	1.00	LS	2,000	2,000. -
A8	Supply and install 400 mm min. dia. SWWSP (9.53 mm wall thickness) by the boring (Jack and Bore) method (Approx. 20 m). (Sta. 0+085 to Sta. 0+105)(SP A8)	1.00	LS	791.00	15,820. -
A9	Supply and install one (1) 600 mm x 600 mm inline concrete DICB c/w directional berm. (Sta. 0+105) (SP A7)	1.00	LS	2,000	2,000. -
	<u>Main Drain</u> <u>(Slideroad 25 South ROW) (Sta. 0+307)</u>				
A10 a)	Supply and install one (1) 600 mm x 600 mm inline concrete DICB c/w directional berm. (Sta. 0+307) (SP A10)	1.00	LS	2,000	2,000. -
b)	Supply and install one (1) BSWI c/w approx. 40 m of 200 mm dia. perforated HDPE (320 kPa) c/w non-woven geo-textile and approx. 16 m OPSS 19 mm clear crushed stone and pea gravel cells (per the accompanying details). (Sta. 0+307) (SP A10)	1.00	LS	112.50	4,500. -
				<b>SUBTOTAL:</b>	28,320.00

## SCHEDULE OF UNIT PRICES

**R. J. Burnside & Associates Limited**

**Project No. 300038962**

**Page No. 3**

**Contractor:** \*\*\*

**Address:** \*\*\*

**Contract Title:** Russell Municipal Drain

### SCHEDULE B - CONTINGENCIES

ITEM NO.	DESCRIPTION	CONTRACT QUANTITY	UNIT	UNIT PRICE	CONTRACT TOTAL
B1	Existing tile reconnections and tile connections to the drain (as approved by the Engineer) (SP B1)				
a)	100 mm diameter pipe - Reconnection	2.00	ea	85.00	170.00
b)	150 mm diameter pipe - Reconnection	2.00	ea	95.00	190.00
c)	100 mm diameter pipe - Connection	2.00	ea	110.00	220.00
d)	150 mm diameter pipe - Connection	2.00	ea	125.00	250.00
B2	Install a 450 mm thickness of OPSS R-50 quarry stone rip-rap with geotextile underlay. (SP B2)	25.00	m²	62.50	1562.50
B3	OPSS 19 mm (3/4") crushed clear stone delivered on-site. (SP B3)	45.00	t	30.00	1350.00
		45.00	t	18.00	810.00
B4	OPSS Granular 'B' material delivered on-site. (SP B4)				
B5	Supply and install 375 mm dia. Solid HDPE (320 kPa) dual -wall pipe on OPSS 19 mm dia. crushed clear stone bedding in areas of soil instability, as directed by the Engineer. (per the accompanying details) This cost for installation with excavator would replace the bid price for installation with the drainage plow.				
a)	150 mm depth bedding and backfill to pipe springline. (SP B5)	25.00	m	47.50	1187.50
				<b>SUBTOTAL:</b>	<b>5740.00</b>

**SCHEDULE OF UNIT PRICES/SUMMARY**

**SCHEDULE**

A - Main Drain	\$ 22444.00
A - Main Drain (Continued)	\$ 28320.00
B - Contingencies	\$ 5740.00
SUB-TOTAL Bid Price/Estimated Contract Price	\$ 56504.00
HST (@ 13%)	\$ 7345.52
TOTAL Bid Price/Estimated Contract Price	\$ 63849.52

All amounts in this Appendix "G" are in Canadian dollars.

The estimated quantities set out in this Appendix "G" are only approximate and the actual measured and approved quantities may vary from such estimated quantities.

The lump sum amounts and unit prices set out in this Appendix "G" shall apply to the Contract and are inclusive of all costs and expenses required to perform and complete the Work including, without limitation, all applicable federal and provincial sales taxes, excise taxes and other taxes, insurance, permits, customs, duties and transportation, except for the HST (referred to separately in this Appendix "G").

**Per the DFO Letter of Advice, the in-water Work under this Contract MUST be completed outside of the March 15 to July 15 timing window (inclusive) and scheduled to avoid wet period which may increase erosion and sedimentation.**

**If the Contractor chooses to work in poor conditions, payment for additional costs resulting from this work will be at the discretion of the Owner and the Contract Administrator.**

**The Contractor must adhere to their proposed start and completion dates (in accordance with section D.1.4), and failure to do so may be subject to liquidated damages at the discretion of the Contract Administrator.**

**Any proposed construction outside the proposed start and completion dates and/or is subject to approval by the Contract Administrator.**



**Preference will be given to Bids scheduled for 2020 construction; however, bids indicating construction in 2021 will also be considered.**

**The Work under this Contract shall be substantially performed by December 1 of the year construction is commenced (2020/2021).**

PROPOSED START DATE: June 15/20

PROPOSED COMPLETION DATE: July 15/20

## **D.1 GENERAL REQUIREMENTS**

### **D.1.1 Contract Time**

**Per the DFO Letter of Advice, the in-water Work under this Contract MUST be completed outside of the March 15 to July 15 timing window (inclusive) and scheduled to avoid wet period which may increase erosion and sedimentation.**

**If the Contractor chooses to work in poor conditions, payment for additional costs resulting from this work will be at the discretion of the Owner and the Contract Administrator.**

**The Contractor must adhere to their proposed start and completion dates (in accordance with section D.1.4), and failure to do so may be subject to liquidated damages at the discretion of the Contract Administrator.**

**Any proposed construction outside the proposed start and completion dates and/or is subject to approval by the Contract Administrator.**

**Preference will be given to Bids scheduled for 2020 construction; however, bids indicating construction in 2021 will also be considered.**

**The Work under this Contract shall be substantially performed by December 1 of the year construction is commenced (2020/2021). This completion date is contingent upon Acceptance occurring within three (3) weeks of the Bid Closing Time. The completion date will be adjusted accordingly should Acceptance occur beyond the three (3) week period following the Bid Closing Time. Weather conditions will not constitute a basis for extension of the completion date unless, in the sole opinion of the Contract Administrator, conditions have varied substantially from what is reasonably considered normal for the season(s) (i.e., in the event of abnormal inclement weather).**

### **D.1.2 Insurance Requirements**

**The successful Bidder is required to provide certificates/proof of insurance for all mandatory coverage required by the General Conditions of Contract.**

**In addition, in accordance with GC 6.03.01 General, the Contractor shall provide all risks property insurance as per GC 6.03.05.01.**

The insurance policies shall name the following parties as additionally insured:

- **Municipality of Brockton**
- **R.J. Burnside & Associates Limited**

and shall insure the Contractor and the above named in the same manner and to the same extent as if a separate policy had been issued to each.

In addition to the above requirements, if blasting operations are used in the Contract, the Contractor shall take out and keep in force an insurance policy providing coverage for blasting operations to the same limits as set out in the General Conditions.

Contractors are hereby specifically notified that any loss or damage to the Work caused by the action of the elements including rain storms, wind storms, floods, etc., shall be sustained and borne by the Contractor at his own expense. Any material and additional work required to make good any loss or damage to work previously completed shall be borne at the cost of the Contractor and no claims for extra payment will be considered.

#### **D.1.3 OPSS & OPSD**

Relevant Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) in effect at the Official Closing Time, which are related to, or integral to the Work, apply to this Contract unless otherwise noted. OPSS "Municipal Oriented Specifications" will apply unless this project has been specifically designated as an MTO type "Provincial Oriented" project.

#### **D.1.4 Schedule of Work**

Upon being awarded the Contract, the Contractor shall forthwith supply to the Contract Administrator for approval a copy of a detailed planned Schedule of Work, showing clearly that the Work will be completed within the stipulated time.

#### **D.1.5 Contract Administrator's Field Office**

A separate field office for the Contract Administrator will not be required for this Contract.

#### **D.1.6 Winter Work**

No additional payment will be considered for the protection of the Work as required by the relevant OPSS for cold weather or winter conditions. The Contractor is encouraged to schedule his work to avoid placing concrete, asphalt or other temperature sensitive materials in cold weather and to avoid freezing of granular material during the operations employing these materials. Where the Contractor's schedule shows work involving temperature sensitive materials during a time frame where cold weather conditions may potentially or can be reasonably expected to occur, the price in the Schedule of Unit Prices shall be deemed to include the necessary cold weather provisions and no additional costs will be considered.

#### **D.1.7 Provision for Traffic**

All references in the Contract to the Manual of Uniform Traffic Control Devices (MUTCD), including all Parts and Divisions thereof, or MTO Traffic Control Manual for Roadway Work Operations, or Traffic Control Manual for Roadway Operations Field Editions are hereby deleted and replaced by the following books of the Ontario Traffic Manual (OTM):

- Book 5 – Regulatory Signs
- Book 6 – Warning Signs
- Book 7 – Temporary Conditions (& Temporary Conditions Field Edition)
- Book 11 – Pavement, Hazard and Delineation Markings
- Book 12 – Traffic Signals

Any reference in the Contract to OTM shall be deemed to be the Ontario Traffic Manual (Books 5, 6, 7, 11 and 12).

The Contractor shall comply with the applicable requirements of the above Ontario Traffic Control Manual book(s).

The Contractor shall be responsible for providing signing and traffic control in accordance with the Ontario Traffic Manual (OTM) and the OTM Book 7 Temporary Conditions - Field Edition.

Access shall be maintained at all times to any entrances within the limits of the Contract.

The Contractor is responsible for notifying any affected emergency agencies, transportation agencies, businesses, residents, etc., regarding access/traffic disruptions.

The Contractor shall provide a watchman or other suitable employee to inspect and maintain the signs, barricades and pedestrian ramps on a daily

basis as well as weekends and other times when the Contractor is not working.

The Contractor shall provide an adequate number of traffic control persons to direct traffic at any time during construction as required by the Contract Administrator.

If there is no separate payment item for this work, then the costs are deemed to be included in the Bid Price.

#### **D.1.8 Dust and Mud Control**

The Contractor will be responsible for dust control as deemed necessary by the Owner during construction by watering and calcium application as directed by the Contract Administrator. Clean-up of mud tracking off site shall similarly be the Contractor's responsibility.

#### **D.1.9 Disposal of Materials**

The Contractor shall dispose of all waste and/or surplus materials in a disposal area selected by the Contractor in accordance with OPSS 180. The site shall be located off the Municipal right-of-way. The Contractor shall be responsible for all work involved in disposing the waste or excess material including trucking, access roads, levelling, and all haulage and/or dumping fees applicable.

The Contractor shall identify the disposal area and provide a release from the disposal area owner upon completion of the work.

Where any materials are designated to be salvaged, the Contractor can consult the appropriate special provisions for direction.

#### **D.1.10 Environmental Requirements**

It is intended that the Work proposed be executed in such a manner which, to the fullest possible extent, minimizes any adverse effect on the cultural and natural environment of the project area. The environmental conditions of the Contract stated herein must be complied with in all respects. It is a responsibility of the Contractor that all personnel be sufficiently instructed so that the Work is carried out in a manner consistent with minimizing environmental impact. The Contractor is expected to undertake the Work in such a manner that allows for the local area to be restored. It will also be required that the Contractor employ all reasonable precautions to minimize the impact of construction on the upstream and downstream environments.

Restoration shall not be undertaken as a final project task but shall be initiated as soon as excavation or backfilling/compaction activities have been completed.

### **Permits and Authorization**

The requirements set out in any permits issued for the project shall form part of this Contract and shall be strictly adhered to.

Any deviation from the prescribed requirements and/or methods contained in or implied by the permits as issued and this Contract will result in a work stoppage until such time as the Contractor produces suitably approved or revised permits acknowledging the proposed deviation. All costs associated with revised work permits will be solely the responsibility of the Contractor.

### **Refueling Areas**

The Contractor shall undertake a detailed review of the proposed route of construction to plan access routes and fuelling areas. Refuelling and maintenance of equipment shall not be undertaken in or adjacent to a watercourse. Suitable fuelling and maintenance areas shall be established away from the waterway and all maintenance and fuelling conducted in these areas. The locations of such areas are subject to review by the Contract Administrator. Procedures for the interception and rapid cleanup and disposal of spillages that do occur shall be submitted to the Contract Administrator for review prior to starting work. All materials required for cleanup of fuel spillages shall be maintained readily accessible on site.

The exception of these fuelling locations requirements shall be generators, cranes, backhoes or shovels which may be fuelled at other than the designated fuelling areas. However, no fuelling of backhoes shall be carried out within 30 m of any watercourse.

Any spills apt to cause impairment to the natural environment must be immediately reported by the Contractor to the Contract Administrator and to the local Ministry of the Environment District Office.

### **Sediment Basins & Settling Ponds**

The Contractor shall take all precautions so as not to affect the quality of water as it passes through the area and to prevent eroded material from construction operations from entering streams, watercourses or private property. Appropriate sediment retention measures shall be incorporated in the Work to ensure that sediment discharge to watercourses adjacent to the working area is minimized.

The Contractor shall provide rock check dams and straw bale flow checks and any other sediment or erosion control devices either indicated on the Contract Drawings, detailed in the Special Provisions, as specified by the Permit Issuing Authorities, or as directed by the Contract Administrator.

Sediment traps or similar sediment protection shall be constructed for receiving the discharge from dewatering operations. Temporary sediment traps shall be constructed in advance of any work where eroded materials could enter the watercourse. The overflow rate from settling or sedimentation ponds shall be such that the solids carryover is minimal. The Contractor shall incorporate filter berms or sandbags, as required, to retard and filter run-off prior to discharge to the watercourse.

In general, concentrated run-off from un-stabilized areas shall be intercepted and diverted to stabilized areas under sheet flow conditions. Any water pumped for the purposes of trench or structure excavation or dewatering shall be directed to a settling basin or other device to reduce suspended solids content prior to discharge to a storm sewer, drainage ditch or natural watercourse.

The Contractor shall clean and maintain the sediment traps as required. The traps shall be cleaned when approximately fifty percent (50%) filled with sediment and as directed by the Contract Administrator. The sediment traps shall be maintained until embankment slopes and ditches in the area are reinstated. The traps shall then be removed and the area restored to its original grade or as shown on the Contract Drawings.

The Contractor shall not permit any excavated materials or other material to be deposited in any watercourses except as indicated in the Contract Documents such as rip rap, river stone or clear stone.

The following is a partial list of precautionary measures the Contractor may elect to employ in order to execute the Work within the requirements noted above. NOTE: This listing shall not be taken to represent the full range of precautionary measures available to the Contractor.

1. The use of heavy construction machinery on the streambed and banks shall be avoided unless specifically approved.
2. Where the stream is relocated or diverted temporarily, such relocation or diversion should be done through dry construction. The channel of the new stream (including all slope protection) must be completed before the old stream is diverted into the new channel.

3. The disturbance of low vegetation cover should be avoided as much as possible; the disturbance of soil cover should be minimized and disturbed areas should be vegetated or otherwise protected from erosion as soon as possible.
4. Fill material and excavated materials should be located away from the watercourse and protected from erosion.
5. Any constriction of flow should be compatible with streambed material to prevent erosion or other damage caused by an increased velocity in flow. Stream flow must be maintained throughout the construction period so as not to interfere with fish migration and spawning or other downstream users.
6. Where water quality impairment is unavoidable, measures to protect downstream users must be taken.
7. Upon completion of the project, any temporary fill, culverts, refuse, etc. must be removed from the construction area and deposited in an approved disposal area away from the site.
8. The inlet and the outlet of any culverts should be protected against erosion.
9. All exposed areas should be redeemed or re-vegetated immediately after construction is completed.

#### **Measurement for Payment**

No direct measurement of quantities will be made for this work unless specifically noted in the Schedule of Unit Prices. The work will be administered as being part of the related environmental protection items or as part of the overall site work.

#### **NOTE:**

##### ***Fish Habitat Definition According To The Fisheries Act Of Canada***

Fish habitat means "spawning ground and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes".

##### ***Dam Definition According To The Lakes And Rivers Improvement Act***

Dam is "a dam or any work which forwards, holds back or diverts water".



#### **D.1.11 Existing Conditions**

The Contractor shall clean up and restore all disturbed areas to condition equal to or better than existing conditions using materials equal to or better than existing materials. This includes the removal and disposal of all layout materials, string lines, batter boards and other such materials.

The Contractor shall maintain flow in all existing sewers, drains, ditches, watercourses, house and inlet connections, as applicable.

Sanitary sewers shall not be used for the discharge of water from excavations or dewatering operations.

#### **D.1.12 Damage by Vehicles and Other Equipment**

If at any time, in the opinion of the Contract Administrator, damage is being or is likely to be done to any highway or any improvement thereon, other than such portions as are part of the Work, by the Contractor's vehicles or other equipment, whether licensed or unlicensed, the Contractor shall, on the direction of the Contract Administrator and at the Contractor's own expense make changes in or substitutions for such vehicles or other equipment or shall alter loading or shall in some manner remove the cause of such damage to the satisfaction of the Contract Administrator.

#### **D.1.13 Measurement and Payment**

Unless otherwise noted in the Schedule of Unit Prices, no measurement of quantities will be made for the General Work and no direct payment will be made for any of the General Work. The cost of such work shall be deemed to be reasonably distributed within the overall cost of the Work.

Payment for payable items shall be based upon the lump sum or unit price bid, as listed in the Schedule of Unit Prices, using actual "as-constructed" quantities (or plan quantities) as determined by the Contract Administrator. In the event of conflict between the Schedule of Unit Prices and OPSS, the basis of payment indicated in the Schedule shall take precedence (as modified by "pay lines" or payment clauses indicated elsewhere in these documents, if applicable).

#### **D.1.14 Dewatering**

The Contractor shall dewater excavations/trenches, and maintain the groundwater level at least 0.5 m below the excavation bases, thereby

facilitating proper completion of the Work in reasonably dry, stable conditions.

**D.1.15 Compaction**

Unless otherwise noted, all granular materials shall be compacted to 100 percent (100%) SPMDD and all subsoil to 95 percent (95%) SPMDD.

**D.1.16 Utilities**

The Contractor's attention is drawn to the possible presence of underground utilities. The locations of such, if indicated on the drawings represent to the best of the Owner and Contract Administrator's knowledge, the approximate location of such utilities. The Contractor shall be responsible for all utility stakeouts as per GC7.01.16 as well as any inspection or test pits required and the inspection of any manholes, catchbasins, sewers or vaults necessary to locate any utility. The Contractor shall be wholly responsible for the accuracy of the information gathered by their own forces.

The work site may also be located directly adjacent to high voltage power transmission and telephone lines. The Contractor shall be aware of such lines at all times and shall utilize equipment and methodologies in the undertaking of the Work that do not constitute a hazard or safety violation under the Occupational Health and Safety Act.

## **E.1 CONTRACT DRAWINGS**

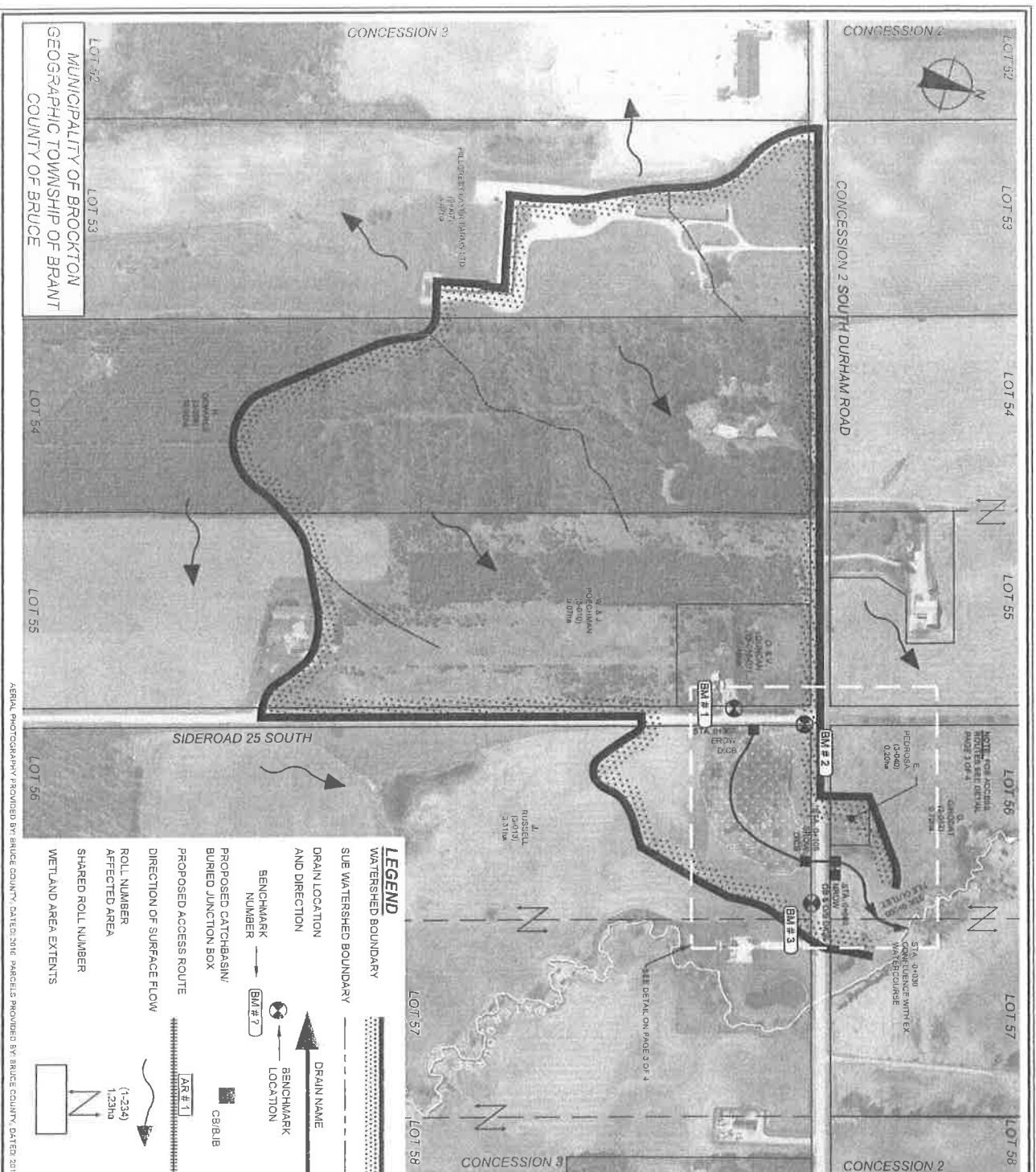
The Work required under this Contract shall be performed in strict accordance with the following drawings:

<b><u>Drawing No.</u></b>	<b><u>Drawing Title</u></b>
1 of 4	Watershed Plan
2 of 4	Profile
3 of 4	Details
4 of 4	Details (Cont.)
1 of 1	Catchbasin Details
1 of 1	Soil Test Pit Locations


These drawings are the Contract Drawings and form part of this Contract. Additional drawings showing details in accordance with which the Work is to be constructed may be furnished from time to time by the Contract Administrator, if found necessary, to supplement or supersede the drawings hereto attached. Such additional drawings shall thereupon become a part of this Contract. The Contract Drawings are complementary to the Contract Documents; any item or information found in one applies to both.

The Contractor shall be governed by the figured dimensions, as given on the drawings. The Contractor shall confirm all relevant dimensions and report any discrepancies to the Contract Administrator immediately.

Where required dimensions are not shown in figures, the Contractor shall obtain the said dimensions from the Contract Administrator before proceeding with the construction of the portion of the Work to which they refer. In every case, detailed drawings shall take precedence over general drawings. In no instance shall dimensions be scaled from drawings.



No.	Issue / Revision	Date	Auth
1	ISSUED FOR INFORMATION MEETING	2016/08/26	EMD
2	ISSUED FOR INFORMATION MEETING NO.2	2016/09/27	EMD
3	ISSUED FOR AGENCY APPROVAL	2017/02/24	EMD
4	ISSUED FOR INFORMATION MEETING NO.3	2017/05/11	EMD
5	ISSUED FOR ENGINEER'S REPORT	2018/09/10	EMD



# BURNSIDE

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**DRAIN**

**RUSSELL MUNICIPAL DRAIN 2013**


**Drawn**

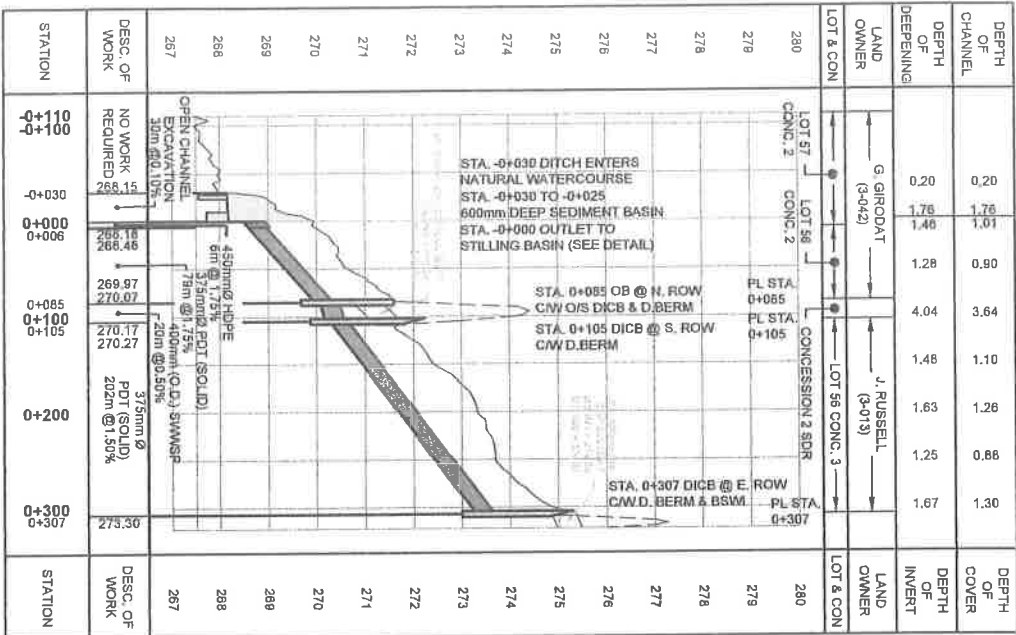
**MUNICIPALITY OF BROCKTON**

**100 SCOTT STREET**  
**WALKERTON, ONTARIO**  
**N0G 2X0**

Date	Checked	Drawn
300038652	2016/08/26	EMD
Project No.		

**1 OF 4**





DEPTH OF CHANNEL	0.20	1.76	1.01	0.80	1.10	0.86	1.30	DEPTH OF COVER
DEPT OF DEEPENING	0.20	1.76	1.46	1.28	4.04	1.48	1.63	1.25
LAND OWNER	G. GIRDAD (3-042)	J. RUSSELL (3-013)						
LOT & CON	LOT 57 CONC. 2	LOT 58 CONC. 2	CONCESSION 2 SDR	LOT 56 CONC. 3				LOT & CON
280								280
279								279
278								278
277								277
276								276
275								275
274								274
273								273
272								272
271								271
270								270
269								269
268								268
267								267
DESC. OF WORK	NO WORK REQUIRED	268.15 268.16 268.46 269.97 270.07 270.17 270.27 375mm Ø PDI (SOLID) 202m @ 1.50%	275.30					DESC. OF WORK
STATION	0+110 0+100	0+030 0+006	0+085 0+105	0+200	0+300 0+307			STATION

PIPE MATERIAL	JOINING METHOD	DIAMETER (mm)	STATION FROM TO	LENGTH (m)	NOTES
POT	SPLIT COUPLER	375	0+105	0+307	202 SINGLE WALL SOLID CORRUGATED HDPE (210 MPa) C/W NON-WOVEN GEOTEXTILE
SWAMP	WELDED	400	0+085	0+105	20 O.D. (6.35mm THICKNESS)
HDPE	SPLIT COUPLER	250	0+085	6m O/S E	6 DUAL-WALL SOLID HDPE (320 MPa) C/W NON-WOVEN GEOTEXTILE
PDI	SPLIT COUPLER	375	0+006	0+085	79 SINGLE WALL SOLID CORRUGATED HDPE (210 MPa) C/W NON-WOVEN GEOTEXTILE
HDPE	BELL & SPIGOT	450	0+000	0+006	6 DUAL-WALL HDPE (320 MPa)

STATION	TYPE	SIZE (mm)	TOP/LOW WALL ELEV.	GRATE	NOTES
0+307	D/CB	600mm X 600mm	274.85	BIRDAGE	C/W D. BERM & BSM
0+105	D/CB	600mm X 600mm	271.90	BIRDAGE	C/W D. BERM
0+085	OB	600mm X 600mm	271.80	BIRDAGE	C/W O/S D/CB
0+085	D/CB	600mm X 800mm	270.70	BIRDAGE	C/W D. BERM, O/S 6m E

STRUCTURE NOTES:

1. ANY VARIATION FROM THE ELEVATIONS AND DIMENSIONS OF THESE STRUCTURES MUST BE APPROVED BY THE ENGINEER.
2. STRUCTURES NOT MANUFACTURED AS SPECIFIED MAY BE REJECTED FOR USE AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR AND STRUCTURES SHALL HAVE A MINIMUM SLOPE OF 30mm UNLESS OTHERWISE NOTED. BUILT STRUCTURES ARE NOT REQUIRED TO BE REJECTED.
4. ALL ABOVE GRADE STRUCTURES SHALL HAVE BIRDAGE GRATES TO SUIT AND R/R-AP C/W GEOTEXTILE UNDERLAY FOR ONE METRE AROUND THE STRUCTURE. JUNCTIONS INDICATED OTHERWISE IN THE DETAIL SPECIFICATIONS.
5. ALL ABOVE GRADE STRUCTURES ARE TO HAVE POSTED AND MARKED.
6. ALL GRATES SHALL BE 600mm X 600mm UNLESS OTHERWISE NOTED.
7. ALL STRUCTURES MUST HAVE PLUGGED INLETS IN THE SIDES NOT UTILITY OR UNLESS OTHERWISE NOTED. ALL PLUGGED INLETS MUST HAVE THEIR LOCATION DEFINED ON THE INSIDE OF THE STRUCTURE.
8. ALL CONNECTIONS TO STRUCTURES MUST BE MADE USING RIGID PIPE WHICH MUST SPAN FROM THE STRUCTURE TO UNDERNEATH NATIVE SOIL.
9. ALL STRUCTURES SHALL BE SPECIFIED TO THE MUNICIPAL GRATE INLETS AND OUTLETS SHALL BE INSTALLED IN THE 1200mm WALLS AND THE PLUGGED INLETS SHALL BE IN THE 600mm WALLS. JUNCTIONS NOTED OTHERWISE.
10. ALL STRUCTURES SHALL BE CAST WITH A MINIMUM OF A 150mm HIGH RIB SECTION TO ALLOW FOR ADJUSTMENT OF THE TOP ELEVATION TO SUIT FIELD CONDITIONS. ACCORDINGLY NO MONOLITHIC STRUCTURES WILL BE PERMITTED.
11. A CATCH BASIN (CB) OR DECK IS INTENDED TO BE ON SURFACE WATER. AN OBSERVATION BOX (OB) IS INTENDED FOR TILE INSPECTION OF THE STRUCTURE.
12. ALL SLOPES SHALL BE 1:1 SLOPE AND ALL 1:1 SLOPE SHALL BE 1:1 SLOPE WITH CORRESPONDING BIRDAGE GRATES.

PIPE NOTES:

1. ALL PIPE AND PIPE WORKS SHALL CONFORM TO THE GENERAL SPECIFICATIONS.
2. ALL CONCRETE DRAINAGE (C/D) SHALL BE NON-REINFORCED 2000 PAVED OR APPROVED EQUAL.
3. ALL HIGH DENSITY POLYETHYLENE (HDPE) PIPE SHALL BE DUAL-WALL UNLESS OTHERWISE NOTED OR APPROVED EQUAL.
4. ALL SMOOTHTHE POLYETHYLENE (HDPE) PIPE SHALL BE DUAL-WALL UNLESS OTHERWISE NOTED OR APPROVED EQUAL.
5. ALL CORRUGATED STEEL PIPE (CSP) SHALL BE GALVANIZED AND CONFORM TO THE GENERAL SPECIFICATIONS.
6. ALL CORRUGATED STEEL PIPE (CSP) SHALL BE GALVANIZED AND CONFORM TO THE GENERAL SPECIFICATIONS.
7. ALL OUTLET PIPES SHALL BE CORRUGATED STEEL PIPE (CSP) OR HIGH DENSITY POLYETHYLENE (HDPE).
- 7.1. CSP OUTLET PIPES SHALL BE CORRUGATED STEEL PIPE (CSP) OR HIGH DENSITY POLYETHYLENE (HDPE).
- 7.2. COMPLETE WITH A GEO-TEXTILE WRAPPED CONNECTION.
- 7.3. HOPE OUTLET PIPES SHALL BE THE SAME DIAMETER AS THE LAST SECTION OF THE COMPLETE WITH A BELL CONNECTION TO FIT AROUND THE PIPE. THE CONNECTION SHALL BE GEOTEXTILE WRAPPED.
- 7.4. ALL OUTLET PIPES SHALL HAVE A ROBERT GRATE AND HAVE R/R-AP PROTECTION.

BENCHMARKS:

BENCHMARK # 1  
ELEVATION = 275.59  
NAIL IN HYDRO POLE 7.5m W OF SIDEROAD 255. 2m S OF CULVERT CROSSING  
BENCHMARK # 2  
ELEVATION = 275.83  
NAIL IN HYDRO POLE 8m S OF CONCESSION 2 SOUTH  
BENCHMARK # 3  
ELEVATION = 273.13  
NAIL IN HYDRO POLE 15m E OF CONCESSION 2 SOUTH DRAIN ROAD  
AND 5m E OF E.T.A. 0+105

Notes

1. This drawing is the exclusive property of R.J. Burnside & Associates Limited. The reproduction of any part without prior written consent of the owner is strictly prohibited.
2. The contractor shall verify all dimensions, levels, and datum on site and report any discrepancies or omissions to the owner prior to construction.
3. The drawing is to be read and understood in conjunction with all other plans and documents applicable to the project.
4. All property lines are approximate and for information purposes only.

FOR REPORT

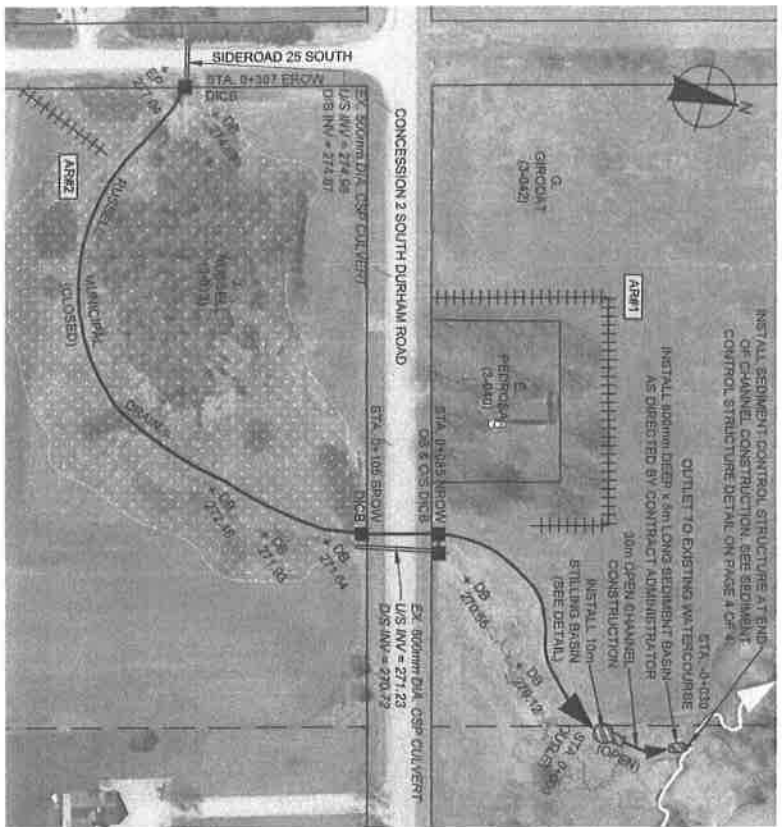
No.	Issue / Revision	Date	Auth.
1	ISSUED FOR INFORMATION MEETING	2016/02/26	END
2	ISSUED FOR INFORMATION MEETING NO. 2	2016/09/27	END
3	ISSUED FOR AGENCY APPROVAL	2017/02/24	END
4	ISSUED FOR INFORMATION MEETING NO. 3	2017/05/11	END
5	ISSUED FOR ENGINEER'S REPORT	2016/09/10	END

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CITY OF MUNICIPALITY OF BROCKTON  
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WALKERTON, ONTARIO  
N0G 2V0

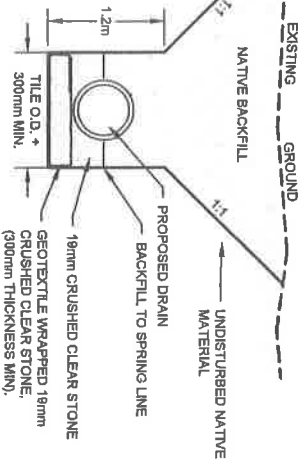
Drawing Title  
RUSSELL MUNICIPAL DRAIN 2018

Drawn	Checked	Date	Drawn No.
TK	EMD	2016/08/26	2 OF 4
Scale	Project No.		
H 1:5000 - V 1:500	300038962		



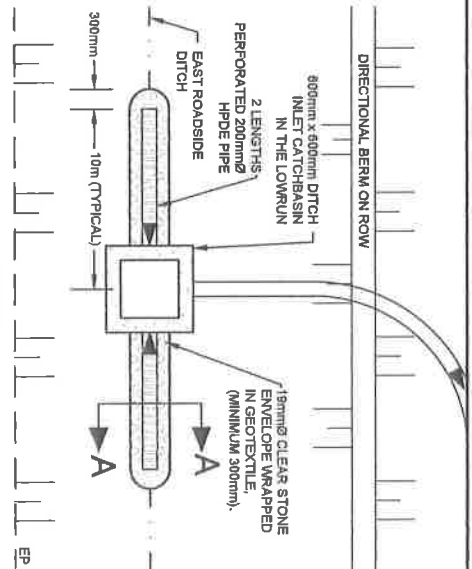
### SPECIAL INSTALLATION TECHNIQUE (TYPICAL)

N.T.S.



### DRAIN OUTLET DETAIL

SCALE - 1:1500

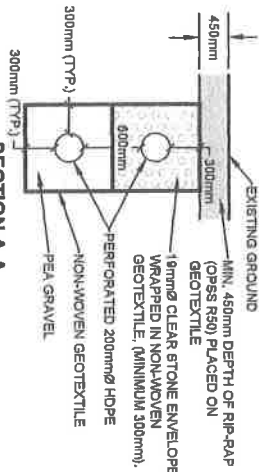


### PLAN

### SECTION A-A

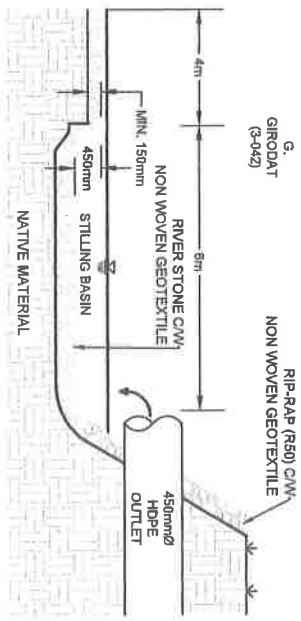
### BURIED SURFACE WATER INLET (BSWI)

N.T.S.



### STILLING BASIN DETAIL - PROFILE

N.T.S.



- Notes
- This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
  - The contractor shall verify all dimensions, levels, and bearings on the site and report any discrepancies or omissions to the office prior to construction.
  - This drawing is to be read and understood in conjunction with all other plans and documents applicable to the project.
  - All property lines are approximately and for information purposes only.

### FOR REPORT

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WALKERTON, ONTARIO  
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**RUSSELL MUNICIPAL DRAIN 2018**

### DETAILS

Drawn	Checked	Date	Drawing No.
TK	EMD	2016/08/26	3 OF 4
Scale	Printed No.	300038862	







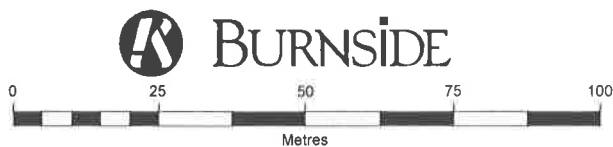
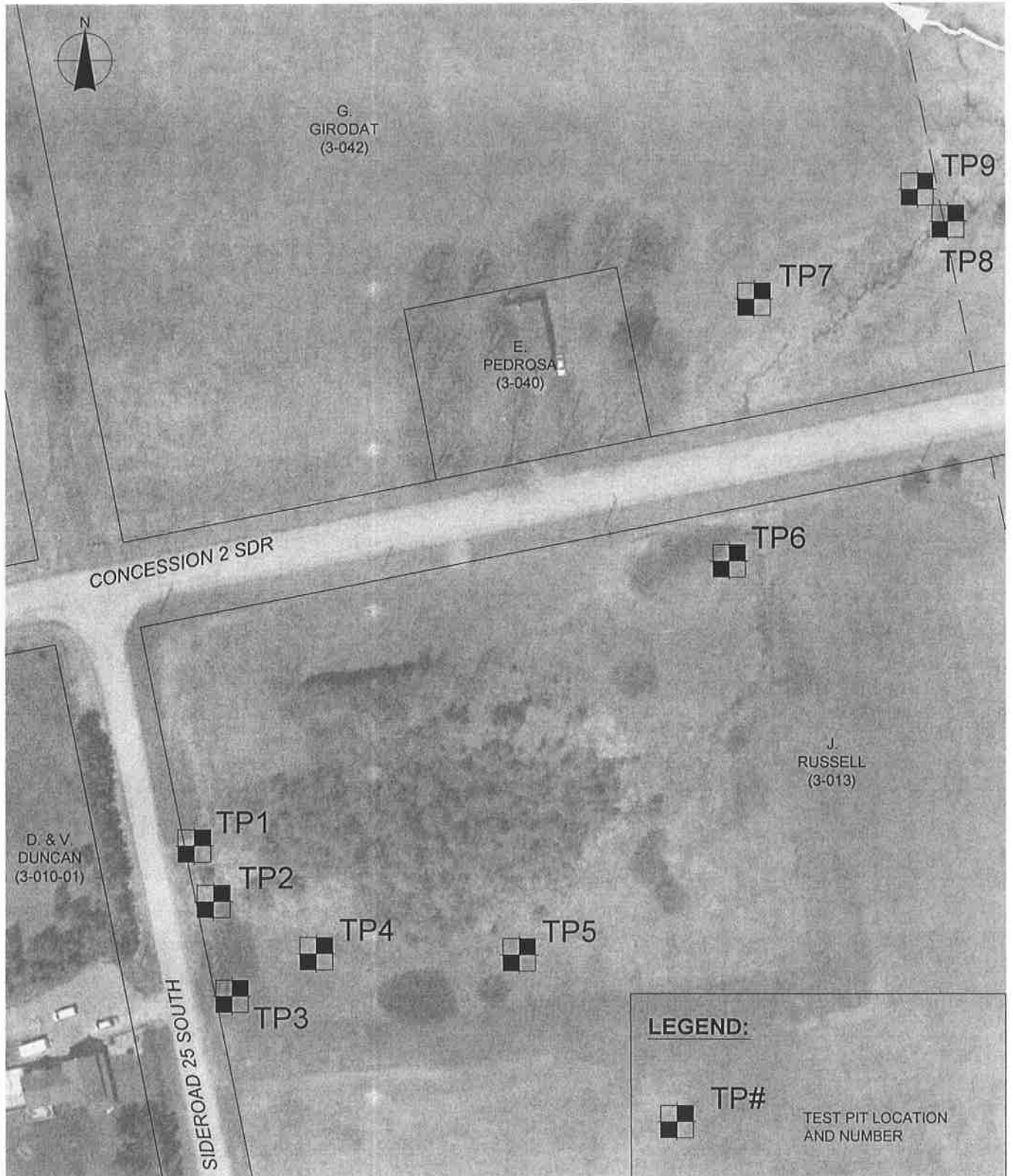


Figure Title

**RUSSELL MUNICIPAL DRAIN**

**SOIL TEST PIT LOCATIONS**

Client

**MUNICIPALITY OF BROCKTON**

Drawn

TK

Checked

EMD

Date

2017/05/11

Scale

1:1250

Project No.

300038962

Figure No.

**FIG1**

## **E.2 STANDARD SPECIFICATIONS**

- E.2.1 General Drain Specification
- E.2.2 Specification for Open Drains
- E.2.3 Specification for Closed Drains
- E.2.5 Specification for Road Crossing – Boring or Directionally Drilled Method

### **E.2.1 GENERAL DRAIN SPECIFICATION**

#### **E.2.1.1 SCOPE OF SPECIFICATION**

This specification covers the general conditions governing the construction of a Municipal Drain under the most recent revision of The Drainage Act and amendments. All work shall be done in accordance with current and applicable Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD).

#### **E.2.1.2 BENCHMARKS**

Benchmarks shall be set at intervals along the course of the work at locations shown on the accompanying plan and/or profile. The Contractor or landowner shall be held liable for the cost of re-establishing benchmarks destroyed. Attention is drawn to Section 13 of The Drainage Act.

#### **E.2.1.3 STAKES/FLAGS/MARKERS**

Stakes, flags or markers are typically set at intervals throughout the course of the work, at all fences and property lines. The Contractor or landowner shall be held liable for the cost of replacing any stakes removed or destroyed.

#### **E.2.1.4 PROFILE**

The drain is to be excavated or installed to regular gradient lines as shown on the profile(s). These gradients show the bottom of the finished drain (open or closed) and are governed entirely by the benchmarks. In the case of closed drains, the gradient is that of the invert of the tile. The profile(s) shows the approximate depth from the surface of the ground to the invert of the tile or ditch bottom at the point where the stations are set and from the average bottom of the open drain as taken at the time of survey. Open drains shall be brought to an even gradient in the bottom to prevent standing water. For closed drains, a variation of 25 mm (unless specified otherwise) from the gradient may be deemed sufficient reason for the work to be rejected and required to be rebuilt.

#### **E.2.1.5 CLEARING**

**Clearing** means the cutting of all standing trees, brush, bushes and other vegetation to a maximum height of 300 mm above original ground level as well as the removal of felled materials and windfalls. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of clearing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, brush or bushes are to be left inside the slopes of the drain, whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

#### **E.2.1.6 CLOSE CUT CLEARING**

**Close Cut Clearing** means the cutting of all standing trees, stumps, brush, bushes and other vegetation at original ground level and the removal of felled materials and windfalls. Grubbing means the removal of all stumps, roots, embedded logs, debris and secondary growth. Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents.

The work shall consist of close cut clearing all earth surfaces to be covered by embankments greater than 1.2 m in height, and any other areas specified in the Contract Documents.

No trees, stumps, brush or bushes are to be left inside the slopes of the drain whether they are located within the limits of the excavation or not. Brush cleared in accordance with the above shall be piled in a location and in a manner satisfactory to the Engineer for burning by the Owner. Unless otherwise specified or directed, these piles shall be a minimum of 100 m apart and shall contain only cleared material. All work shall be done in accordance with OPSS 201.

#### **E.2.1.7 BRUSHING**

**Brushing** means the grinding or chipping to ground level of vegetation in the working space under 150 mm in diameter by means of a hydraulic brushing

attachment used with an excavator or approved equivalent. This includes grinding or chipping all standing trees, stumps, brush, bushes and other vegetation to original ground level.

Trees measuring 150 mm or more in diameter shall be felled, delimbed, cut into lengths no longer than 4 m and stacked to the designated side of the working space. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

#### **E.2.1.8 GRUBBING**

**Grubbing** means the removal of all stumps, roots, embedded logs, debris and secondary growth.

The work shall consist of grubbing all areas of earth excavation, earth surfaces to be covered by embankments up to and including 1.2 m in height and any other areas specified in the Contract Documents.

Grubbing is not required in swamps. Mechanical stump cutters are permitted, provided the entire root structure is removed. Depressions remaining after grubbing shall be backfilled with suitable earth material and compacted to avoid settlement. When clearing has been previously completed by others, all secondary growth, brush and debris shall be removed.

Piled boulders and surface boulders that are not specified in the Contract Documents for removal and lie within areas to be grubbed shall be removed. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

#### **E.2.1.9 REMOVAL OF SURFACE BOULDERS & REMOVAL OF PILED BOULDERS**

**Piled Boulders** means any cobbles, boulders or rock fragments that have been placed in fence rows or piles.

**Rock** means rock as defined in OPSS 206.

**Surface Boulder** means any boulder or rock fragment that measures 200 mm or greater in any one dimension, extends a minimum of 200 mm above original ground and can be removed without excavation.

The work shall consist of the removal of surface boulders and removal of piled boulders within the areas specified in the Contract Documents. Depressions remaining after removal shall be backfilled with suitable earth material and

compacted to avoid settlement. The work shall not damage or disturb the area outside the areas specified in the Contract Documents. All work shall be done in accordance with OPSS 201.

#### **E.2.1.10 FENCES**

The Contractor will be permitted to remove fences to the extent necessary to allow the construction of the drain and to dispose of any excess material according to specifications. Any such fences shall be carefully handled so as to cause no unnecessary damage. Such fences shall be replaced by the Contractor in as good a condition as found. The Contractor shall supply all material necessary to properly reconstruct any fences. The Contractor shall not leave any fence open when he is not at work in the immediate area and shall replace the fence in a timely manner, all to the satisfaction of the Engineer.

#### **E.2.1.11 STANDING CROPS AND LIVESTOCK**

Should a property owner wish to harvest any crop along an access route or within the construction working space as set out in the Engineer's Report, then it shall be the responsibility of the property owner to do so prior to construction. Provisions for the loss of, or damage to, crops along the access route or in the construction area ("Working Space") have been made in the Report and such loss or damage shall not be the liability of the Contractor.

The Contractor shall contain construction operations to the working space and width specified. As long as the construction operations are contained within the specified working space, the Contractor shall not be responsible for damages to crops along the course of the drain.

It shall be the responsibility of the property owners to keep their livestock clear of the construction area upon receiving 24 hours advance notice by the Contractor. After receiving proper notice, the Owner of the property upon which a drain is being constructed shall be liable for any loss or damage to livestock, the drain, drain materials or the Contractor's equipment caused by their livestock.

#### **E.2.1.12 NOTIFICATION OF AGENCIES**

The Contractor shall notify the appropriate agency before performing any work affecting the land or property of the MTO, railway, telephone, pipeline or public utility or regulatory agency. The Contractor shall further agree to perform the work affecting such lands or property in accordance with the specifications and approval/permit of the applicable agency.

#### **E.2.1.13 FINAL INSPECTIONS**

After substantial completion of the work, but prior to demobilization and final removal of all equipment and materials from the site, the Contractor MUST arrange an on-site FINAL Inspection of the work with the engineer to ensure all aspects of the work have been satisfactorily completed and/or that arrangements have been made to expedite the completion of any outstanding "minor" items or deficiencies. All the work included in the contract, at the time of the Final Inspection, must have the full dimensions and cross-sections called for in the plans and specifications. Notification to the Engineer of this Final Inspection shall be provided at least 5 days prior and it shall be completed as soon as possible or as soon thereafter as weather conditions permit.

## **E.2.2 SPECIFICATION FOR OPEN DRAINS**

### **E.2.2.1 GEOMETRY**

The drain shall have the full bottom width, at the gradient, specified or shown on the accompanying plan(s), profile(s) and detail sheet(s).

### **E.2.2.2 ALIGNMENT**

The drain shall run in straight lines throughout each course except at intersections, where it shall run on a minimum curve of 15 m radius unless otherwise specified. If the work consists of the improvement of an existing open drain, then the centre line of the existing drain may be the centre line of the finished work unless otherwise specified.

### **E.2.2.3 EXCAVATED MATERIAL**

A clear buffer of at least 3 m shall be left between the top edge of the open drain and the excavated material. Excavated material shall be placed on the side specified or, if not specified, on the lower side of the drain or on the side opposite trees or fences. No excavated material is to be left in any low runs intended to conduct water into the open drain. It shall be deposited, spread and leveled to a maximum depth of 150 mm, unless specified otherwise and left in a manner such that the lands on which it is spread may be cultivated with adjacent lands by use of ordinary farm machinery. Material excavated in land that is timbered, may be spread to the depth specified or to a maximum depth of 300 mm. In cultivated areas, the Contractor shall remove stones and boulders on the surface greater than 100 mm diameter from the excavated material and dispose of in an approved location. Treatment of excavated material shall be to the satisfaction of the Engineer. After the excavated material has been spread and leveled, it shall be seeded as specified.

### **E.2.2.4 SURFACE WATER INLETS**

Surface water inlets to the drain shall be provided through the leveled spoil on each property at obvious natural low runs or at other locations as specified by the Engineer on site at the time of construction. No excavated material shall be left in, or any damage done to a ditch, furrow, pipe, tile or depression that is intended to conduct water into an open drain. The ditch bank at all such inlets shall be riprapped as directed by the Engineer and reimbursed under the appropriate contract item.

#### **E.2.2.5 OUTLETS**

During the construction of an open drain, the Contractor shall guard against damaging the outlet of any tributary drain or pipes encountered. The Contractor will be reimbursed for damage to unmarked outlet pipes under the appropriate contract item.

#### **E.2.2.6 ACCESS CULVERTS**

All culverts shall be installed with the invert a minimum of 10% of its diameter or as specified below the gradient and the firm bottom of the drain.

All pipes installed under these specifications shall be carefully bedded so as to ensure uniform bearing throughout its entire length.

Except where requiring concrete cradle or encasement, all pipes shall be bedded on granular fill as specified or as shown on the contract drawings. Bedding shall be hand placed, tamped and consolidated throughout. Granular fill and bedding shall be gravel or crushed stone having no particles over 20 mm in size, except where otherwise specified.

Concrete cradle and concrete encasement shall be placed as shown on the drawings, and the concrete shall be minimum 25 MPa.

From the top of the bedding material to a point 150 mm below the existing grade of the laneway, backfill material shall be clean pit run gravel meeting OPSS Granular "B" or approved equivalent. The material shall be placed in lifts not to exceed 300 mm in depth and all granular materials shall be compacted to 100 % SPMDD and all subsoil or previously excavated material to 95 % SPMDD.

The final 150 mm of the excavation shall be filled with clean crushed gravel conforming to OPSS Granular "A" specifications. The material shall be placed in lifts not exceeding 150 mm in depth and shall be thoroughly compacted to 100 % SPMDD.

#### **E.2.2.7 EXCAVATION AT BRIDGE SITES**

The excavation at bridge sites shall be to the full depth of the drain and as nearly as possible the full width of the drain as specified for the bridge location. The excavation at a bridge site shall be made in a manner to protect the structural integrity of any permanent bridge. A temporary bridge may be carefully removed to allow excavation. The removal of a bridge is to be done in such a manner so as to cause no damage to the bridge components. Temporary bridges removed to allow excavation shall be replaced in as good a condition as found, so far as material allows. Replacing of such bridges shall be to the satisfaction of the Engineer. The



Contractor shall immediately notify the Engineer if it becomes apparent that excavating to a specified gradient will endanger or underpin any culvert or bridge. The Contractor shall cease excavation at the bridge or culvert site until the Engineer instructs the Contractor to proceed.

#### **E.2.2.8 SEEDING**

Unless indicated otherwise in the Special Provisions, the Contractor shall seed all disturbed areas which includes newly excavated ditch banks and leveled spoil (where specified) with the OPSS (MTO) Standard Roadside Seed Mix, consisting of 55% Creeping Red Fescue, 27% Kentucky Bluegrass, 15% Perennial Ryegrass and 3% White Clover, at an application rate of 100 kg/10,000 m<sup>2</sup>, plus a nurse crop of Fall Rye Grain or Winter Wheat Grain at an application rate of 60 kg/10,000 m<sup>2</sup>, at the end of each working day.

#### **E.2.2.9 TEMPORARY SEDIMENT CONTROLS**

Unless indicated otherwise in the Special Provisions, the Contractor shall install an approved sediment control measure at the downstream end of the open drain excavation and at any other locations specified. The Contractor shall remove any accumulated sediment at regular intervals or as directed by the Engineer. The Contractor shall then remove these temporary measures, and any accumulated sediment therein, after the new open drain has stabilized and only after authorized by the Engineer or the Drainage Superintendent.

#### **E.2.2.10 PERMANENT SEDIMENT/STILLING BASINS**

The Contractor shall construct and maintain sediment control or stilling basins as specified in the Special Provisions.

#### **E.2.2.11 RIP RAP & NON-WOVEN GEOTEXTILE**

**Rip Rap** – The Contractor shall supply and install a 500 mm thickness of 150 mm to 300 mm (R50) diameter quarry stone rip rap with filter cloth underlayment for culvert and pipe outlets. This will include areas of the existing bank where erosion or bank slumping has occurred, as directed on-site by the Engineer. For the area surrounding catchbasins, unless noted otherwise, the contractor shall supply and install a 300 mm thickness of 100 to 150 mm (R10) diameter quarry stone rip rap with filter cloth underlayment.

**Non-Woven Geotextile** – All geotextile used for tile wrapping under these specifications shall be non-woven Terrafix 200R (or equivalent). All geotextile used under these specifications for heavy duty applications such as under rip-rap surrounding catchbasins, and at tile outlets in channels shall be non-woven Terrafix 270R (or equivalent).

### **E.2.3 SPECIFICATION FOR CLOSED DRAINS**

#### **E.2.3.1 MATERIALS**

Tile, tubing and pipe materials supplied by the Contractor shall be approved by the Engineer prior to being incorporated in the work. The Contractor shall be responsible for the unloading and placement of all materials required for the Municipal Drain construction. Such unloading and placement shall be undertaken in a manner acceptable to the Engineer using only the specified and approved access routes and working space.

**Concrete Drain Tile (CDT)** - All CDT installed under these specifications shall have a circular cross section with a minimum 2000D, meeting the latest revision of CSA A257.1-14 and ASTM C412. The manufacturer shall provide the Engineer with a copy of all available test results for the materials being shipped to the project site. The Engineer shall have the right to order any additional tests he deems necessary to be performed on the tile taken from inventory prior to shipment from the manufacturer's plant. The cost of such additional tests shall be borne by the Contractor.

**Plastic Drainage Tubing (PDT)** - All PDT installed under these specifications shall be manufactured in accordance with the latest revision of the Drainage Guide for Ontario, as published by the Ministry of Agriculture and Food.

**Corrugated Steel Pipe (CSP)** - All CSP installed under these specifications shall be galvanized spiral wound corrugated steel pipe. All corrugated steel pipe installed under these specifications shall conform to CSA G401.

- CSP tile outlet pipes shall be up to 1,200 mm in diameter and 2.0 mm in thickness and shall have 68 mm x 13 mm corrugations unless specified otherwise.
- CSP culverts shall up to 1,000 mm in diameter and 2.8 mm in thickness and shall have 68 mm x 13 mm corrugations unless specified otherwise. CSP culverts equal to and larger than 1,200 mm in diameter shall be 3.5 mm in thickness and shall have 125 mm x 25 mm corrugations unless specified otherwise.

**High Density Polyethylene(HDPE) Pipe** - All corrugated or dual wall smooth walled HDPE pipe (Armtec BOSS 2000 or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1840 and shall have a pipe stiffness of 320 kPa.

- All perforated dual-wall smoothwalled HDPE pipe joining systems shall be soil-tight split coupler unless specified otherwise, conforming to CSA B182.8.

As specified, perforated pipe shall include a knitted sock or non-woven geotextile covering (Terrafix 200R or equivalent).

- All solid dual-wall smoothwalled HDPE pipe shall be soil-tight split coupler, unless specified otherwise, conforming to CSA B182.8.
- All watertight solid dual-wall HDPE pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.6.

**Steel Reinforced Polyethylene (SRPE) Pipe** - All smooth walled SRPE pipe (Armtec DuroMaxx or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1840. All SRPE pipe shall conform to AASHTO M294.

- All solid SRPE pipe shall be soil-tight split coupler, unless specified otherwise, conforming to CSA B182.14.
- All watertight solid SRPE pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.15.

**Polypropylene (PP) Pipe** - All triple-wall smooth walled PP pipe (ADS HP Sanitite or equivalent) installed under these specifications as culverts or as part of a new closed drain shall be manufactured in accordance with the latest revision of Ontario Provincial Standard Specification 1843 and shall have a pipe stiffness of 320 kPa.

- All watertight solid triple-wall PP pipe joining systems shall be water-tight bell and spigot, complete with gasketed connections unless specified otherwise, conforming to CSA B182.13.

**Non-Woven Geotextile** - All geotextile under these specifications shall conform to OPSS 1860. All geotextile used for tile wrapping under these specifications shall be non-woven Terrafix 200R (or equivalent). All geotextile used under these specifications for heavy duty applications such as under rip-rap surrounding catchbasins, and at tile outlets in channels shall be non-woven Terrafix 270R (or equivalent).

#### **E.2.3.2 DRAIN GRADIENT AND VERIFICATION**

The proposed gradient shall be established using laser grade control equipment, cross-head boning rods together with horizontal sight-bars at stations above and below the point where the tile is being laid or other method acceptable to the Engineer.

If the Engineer has not checked the tile, inspection points shall be left at intervals of not greater than 50 m for sections with gradients less than 0.5 % and at intervals of not greater than 30 m for sections with gradients above 0.5 %. Inspection points shall also be left at all structures and all changes in gradient. Other inspections points may be required from time to time as requested by the Engineer.

### **E.2.3.3 TILE LAYING INCLUDING TOPSOIL STRIPPING**

In the case of the installation of CDT, and unless specified otherwise in the Special Provisions, the Contractor shall strip the topsoil a full width of the trenching machine plus 0.3 m on each side prior to installing the new tile with the trencher as part of the work under the appropriate item and no extra payment will be made for this stripping. After installation, confirming gradient, blinding, and back filling of the trench, the topsoil shall be replaced throughout the entire length of the Drain. The Contractor shall take into consideration the settlement of the backfill material over the trench prior to replacing the topsoil.

All CDT shall be installed with a wheel-type trencher and each tile shall be laid firmly and carefully in a smooth bottomed trench so that successive tiles align both vertically and horizontally as tightly as possible; the maximum allowable space between successive tiles shall be 6 mm.

ALL joints of the CDT MUST be completely wrapped with geotextile (Terrafix 200R or equivalent) as part of the work under the appropriate item and no extra payment will be made for this wrapping. The wrap on each joint shall be a minimum of:

- 300 mm wide for tile sizes smaller than 450 mm diameter
- 600 mm wide for tile sizes 450 mm diameter and above.

The Contractor is reminded that the widths of the tile trenches are to be kept to a minimum. It is recommended that the minimum trench width be 300 mm greater than the outside diameter of the tile or 150 mm on each side of the tile being installed. It is recommended that the maximum trench width be 600 mm greater than the outside diameter of the tile or 300 mm on each side of the tile being installed.

All PDT shall be installed with a self-propelled drainage plow.

All obstructions, dirt or foreign material shall be removed from the inside of the tile prior to laying.

Tile drains shall be constructed at an offset from, and parallel to, any existing ditch, defined watercourse or low run. The Contractor shall exercise care not to disturb any existing private or municipal tile drains which follow the same course as the new drain.

#### **E.2.3.4 RECONNECTION OF EXISTING PRIVATE TILE**

Any subsurface drain encountered by the Contractor when constructing a Municipal Drain under these specifications shall be reconnected to itself and not connected to the new Municipal Drain, unless approved otherwise by the Engineer. The accepted practice for reconnecting existing tile drains will be to compact sub-base material from the new trench bottom to the underside of the existing tile. Rigid pipe, HDPE (320 kPa) or approved equivalent, with a diameter equal or larger than the existing tile with a minimum length of 0.6 m beyond the trench width to the existing tile. This connection shall be made only where the existing tile is operable and in good condition. When completing backfilling of the Municipal Drain trench at such a location, the Contractor shall take sufficient care to ensure that the new connecting pipe is not damaged.

The Contractor shall provide a unit price per connection and the unit price shall include the supply of all material, labour and equipment necessary to make the connection. Further, the Contractor shall keep a written record of all sub-surface drains encountered. All connections completed shall be reviewed with the Engineer on a daily basis and a summary of all subdrains shall be provided to the landowner.

#### **E.2.3.5 CONNECTION OF EXISTING PRIVATE TILES TO MUNICIPAL DRAIN**

A subsurface drain encountered during construction can be connected to the Municipal Drain if requested by the landowner and approved by the Engineer prior to commencement of the connection. The drain shall be connected to the Municipal Drain either by core drilling through the CDT or a prefabricated fitting for HDPE. The core shall be drilled on-site and backfilled as per the specified detail included within the drawings. Any tile drains connected to the Municipal Drain shall have the downstream end of the tile plugged to prevent entry of foreign material into the tile.

#### **E.2.3.6 TRENCH BACKFILLING**

As the laying of the tile progresses, partial filling or blinding shall be made at the sides of the trench sufficient to hold the tiles securely in place. The Contractor shall place the remainder of the excavated material carefully when backfilling the trench. Any excess backfill material shall be mounded over the trench such that future settlement and compaction around the new tile can occur without creating a depression over the width of the trench. The Contractor shall not operate construction equipment over any backfilled trench, except as specified in Trench Crossings. Care shall be exercised in backfilling the trench to see that no stone or boulder capable of damaging the tile is used in the backfill material adjacent to the tile. In no case shall stones having a diameter greater than 150 mm be used in backfill material within 300 mm of the tile. The Contractor shall backfill any open tile trenches at the end of each working day except for inspection points as specified.

The Contractor shall be entirely responsible for any damage to the new tile throughout the warranty period.

#### **E.2.3.7 TRENCH CROSSINGS**

The Contractor shall not cross any backfilled trench with any construction equipment or vehicles, except at only **ONE** designated crossing location on each property which shall be marked in an acceptable manner. 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 insure that no equipment or vehicles are allowed to travel along the length of any trench. The Contractor shall be entirely responsible for any damage to the new tile throughout the warranty period.

#### **E.2.3.8 OUTLET PROTECTION**

The outlet end of a tile drain shall normally consist of a 6 m length of CSP or HDPE fitted with a rodent proof grating which is hinged at the top to allow the exit of foreign material from the tile. An outlet marker shall be supplied and installed.

Unless otherwise specified, the end of the CSP or HDPE shall be protected with the type of riprap on geotextile as specified by the Engineer from a point 500 mm above the ditch bottom on the opposite side of the ditch, across the ditch bottom, and for the full height of the ditch sideslope where the pipe is located. The minimum width of this riprap shall be equal to the outside diameter of the outlet pipe plus 2 m.

#### **E.2.3.9 PRECAST CONCRETE STRUCTURES**

**Junction Box (JB)** means an acceptable precast concrete structure installed and buried below the surface of the ground to facilitate two or more tiles meet and connect.

**Catchbasin (CB) or Ditch Inlet Catchbasin (DICB)** means an acceptable precast concrete structure installed at or slightly below the surface of the ground where two or more tiles meet and connect and that is intended to accommodate surface water.

**Observation Box (OB)** means an acceptable precast concrete structure installed above the surface of the ground where two or more tiles meet and connect and that is intended to only inspect the tile connected thereto.

Unless specified otherwise, JBs, CBs, DICBs and OBs shall be supplied by a precast manufacturer meeting the Engineer's approval. An "approximate elevation of top" of each structure has been indicated on the "Structures Table"; however,

each structure shall be placed onsite such that the exact horizontal and vertical location in the field is as directed by the Engineer. All structures shall have a knock out, set at a minimum of 100 mm above the elevation of the outlet or as specified, placed in all sides not used by the municipal drain. Knock outs must be of a size capable of connecting a HDPE pipe with a minimum inside diameter of 250 mm. All structures shall have a minimum 300 mm deep sump, unless specified otherwise.

Non-shrink grouting material, unless specified otherwise, shall be placed around all pipes connected to the structure. In addition, the exterior of all grouted connections shall be completely wrapped with geotextile (similar to a wrapped joint). Geotextile shall also be placed in the joints between all sections of the box and around the full perimeter of the box at these joints. For the area surrounding catchbasins, unless noted otherwise, the contractor shall supply and install a 300 mm thickness of 100 to 150 mm (R10) diameter quarry stone rip rap with filter cloth underlayment.

Hot dipped galvanized, heavy duty, three-sided protruding type bird cage grates, shall be supplied for all CBs, DICBs or OBs, unless specified otherwise. All DICBs shall have a slope of 2H:1V, unless specified otherwise. Grates shall be fastened to the structure using non-corrosive fasteners as recommended by the Ontario Farm Safety Association. JB's shall have no sump and shall have a minimum 150 mm thick solid reinforced concrete tops.

Post and sign type markers shall be supplied and installed at each at or above ground structure.

#### **E.2.3.10 STRIPPING FOR DEEP TILE INSTALLATION**

Where the tile installation depth exceeds the digging or plowing depth of the Contractor's equipment, the Contractor shall undertake any stripping that may be necessary in a manner such that when restored, the topsoil returns uncontaminated to the top of the stripped area. This would normally mean that the topsoil would be stripped and piled separately from the subsoil. The Contractor shall have regard for the working space provided for such stripping operations. Unless approved otherwise by the Engineer prior to work being undertaken, stripping shall be done using a hydraulic excavator. The cost of any stripping shall be included in the price provided for the tile installation.

#### **E.2.3.11 STONE REMOVAL**

The Contractor shall remove and dispose of any stones larger than 100 mm that remain on the surface of the working space after completion of construction.

## **E.2.4 SPECIFICATION FOR ROAD CROSSING (BORING OR DIRECTIONALLY DRILLED METHOD)**

### **E.2.4.1 GENERAL**

When a drainage works crossing of a Road is to be carried out by the jacking and boring method, the following specifications shall apply as well as OPSS 416. The Contractor shall supply all labour, equipment and material unless specified otherwise in the Special Provisions.

### **E.2.4.2 PIPE MATERIAL**

The pipe or casing used in the crossing shall be smoothwall welded steel pipe (SWWSP) with a minimum wall thickness as specified in the Special Provisions as per OPSS 1802. The pipe shall be of a sufficient length so that during placement no part of any excavation shall be closer to the edge of the gravel shoulder than 2 m and the slope of the excavation from the top to the bottom shall be 1 m vertical to 1 m horizontal (1:1).

### **E.2.4.3 EXTENSIONS**

All extensions of the SWWSP installed via the jacking and boring shall be completed with SWWSP of identical diameter and wall thickness (either from structure to structure or to the limits of the right-of-way). Extensions of any other pipe material will not be acceptable. Pipe shall be placed on undisturbed native material with a minimum of 150 mm drainage stone bedding. Excavated material will not be permitted for use as bedding material.

### **E.2.4.4 INSTALLATION METHOD**

The pipe or casing shall be placed by means of continuous flight augering inside the casing and simultaneous jacking to advance the casing immediately behind the tip of the auger. Complete augering of a tunnel slightly larger than the pipe and placing the entire length by pulling or jacking after completion of the tunnel WILL NOT BE ACCEPTABLE. Once a crossing is completed, the area around the outer annulus and any other openings from the jack and bore shall be grouted at the time of construction.

The Auger pit excavated to accommodate the boring machine shall be constructed such that the edge of the pit shall not be closer than 2 m to the edge of the gravel shoulder. The slope of the pit from the top edge at the shoulder to the bottom of the pit shall not be steeper than 1 m vertical to 1 m horizontal (1:1). Shoring, sheeting, etc. shall be in accordance with all governing regulations and Acts. The pit shall be



left open for an absolute minimum length of time and if at all possible work should be so scheduled so that the excavation, placement of pipe and backfilling takes place in one working day.

During excavation, the existing topsoil shall be stripped and placed in a separate pile for replacement on top upon completion of the backfilling operation; a minimum of 150 mm of topsoil is required and if necessary, the Contractor shall and place imported topsoil. In either case, the topsoil area over the excavation shall be seeded with the specified grass seed mixture to the requirements of the Road Authority. The finished work shall be left in a clean and orderly condition slightly higher than the adjacent ground so that after settlement it will conform to the surrounding ground. Excess material shall NOT be spread on the road allowance or within the right-of-way without the express written consent of the Road Authority but shall be hauled away and disposed of at the expense of the Contractor.

#### **E.2.4.5 PERMITS & TRAFFIC**

The Contractor shall be responsible for providing the Road Authority at least 7 days notice in writing before commencing any work on any right-of-way. If the crossing is on a right-of-way that requires a Municipal or Provincial Permit, the Contractor shall ensure that the Permit is obtained before any work commences.

The Contractor shall be responsible for providing, erecting, maintaining and removing all signage and traffic control in accordance with the Ontario Traffic Manual (OTM) and the OTM Book 7 Temporary Conditions - Field Edition, as noted in Document D of the Tender/Contract.

## **Appendix F – Special Provisions**

### **Russell Municipal Drain**

These ***Special Provisions*** are specific directions for this project in particular and detail requirements not encompassed by - ***Standard Drain Specifications***.

***Special Provisions*** shall take precedence over the ***Standard Drain Specifications*** where a conflict between them may exist.

All work items do not necessarily have an associated Special Provision (SP); accordingly, for those items of the work that do NOT have a SP, please refer to the appropriate **Standard Drain Specification**.

#### **1.0 Standard Drain Specifications**

All work for this project shall also be governed by - **Standard Drain Specifications**. The Contractor is fully responsible for a reasonable and prudent review of these Standards to have a complete and clear understanding of the scope and character of the work.

#### **2.0 Description and Location**

The proposed drain is located in the Municipality of Brockton on Lots 56 and 57, Concessions 2 and 3 (Geographic Township of Brant), County of Bruce.

The proposed Russell Municipal Drain includes approximately 307 m of closed drain and 30 m of open drain construction. The location of the work is shown on the enclosed plan.

#### **3.0 Agency Project Requirements**

Regulatory agencies have provided best management practices and requirements towards the construction of this project which is summarized below. These best management practices and requirements form part of this report and subsequent contract for construction.

##### **3.1 Saugeen Valley Conservation Authority (SVCA)**

###### **3.1.1 Report Investigation**

The Saugeen Valley Conservation Authority (SVCA) has been involved throughout the progression of this project. The SVCA established that the treed area in the northern part of Lot 56, Concession 3 is a wetland and indicated their concerns pertaining to this area. The SVCA has provided input regarding the location and depth of the drain as well as material specifications for the pipe in reference to the adjacent wetland.

Erosion and sediment control will be addressed during construction in the channel through the sediment control structure and along the piped system through ponding water on the landscape, utilizing the surface and buried surface water inlets which will also help with flood mitigation.

### 3.1.2 Construction Direction

Attention is drawn to the ABCA documents located in the Reference Documents. All work is to be in accordance with the terms of these documents and the mitigation practices described above.

## 3.2 Ministry of Natural Resources and Forestry (MNRF)

### 3.2.1 Report Investigation

A request for review of this project was submitted to the MNRF on April 11, 2017. Kathy Dodge, a biologist with the MNRF indicated that their primary concern in this area was for Bobolink, Eastern Meadowlark, and Snapping Turtles. She indicated that the MNRF is most concerned in work areas that interfere with hay fields and pasture land, and less concerned with areas that interfere with row crops. She mentioned that it would be ideal for work do be done outside of **breeding season window from May 1st to July 31st**.

Following a discussion and investigation by Hannah Maciver, a Terrestrial Ecologist with Burnside, the following mitigation measures are recommended to avoid potential impacts to Species at Risk (SAR).

- Apply timing windows to avoid direct impacts to birds during the core breeding window (April 1st and August 31st).
- Conduct a nest survey just prior to removing vegetation (i.e., 1-3 days in advance), in the event that a late nesting bird is still present. Should an active nest be found, all works will stop until the young have fledged from the nest.
- All works should be completed prior to the next breeding season (i.e., prior to April 1st).
- Ensure that the area of works is excluded from the surrounding area to prevent species such as turtles from entering the active work area (i.e., exclusion fencing). Should any wildlife be found, all works will stop until the animal has been safely removed from the work area. If a SAR is found, consultation with MNRF may be required.

The proposed works will occur within active agricultural fields. Two different fields will be affected as part of the proposed works. Both fields will remain suitable for an agricultural operation after the installation is completed. If the recommended avoidance widows listed above are applied, the proposed works will not impact breeding birds and potential breeding bird habitat that is temporarily removed will regenerate prior to the next breeding season. Therefore, no temporary or permanent impacts to Species at Risk are anticipated.

### **3.2.2 Construction Direction**

The primary species of concern in the proposed work area are Bobolink, Eastern Meadowlark, and Snapping Turtles. The mitigation process discussed above shall be followed throughout the project direction from the Engineer's Report.

## **3.3 Fisheries and Oceans Canada (DFO)**

### **3.3.1 Report Investigation**

The proposed Russell Municipal Drain outlets into an existing natural watercourse on Lot 57, Concession 2. The proposed work will take place within the bank of the existing watercourse and will not affect the in-water portion of the watercourse; however, a request for review was completed and submitted in order to keep DFO apprised on the proposed work.

A letter of advice dated February 1, 2018 received from Fisheries and Oceans Canada has been included in the Reference Documents (DFO File Number 17-HCAA-00965). No Federal Species at Risk have been identified within this drainage area that would require special consideration under the Species at Risk Act (SARA).

DFO indicated that their main concerns pertained to the timing of the proposed work. In response to the concerns from DFO, the following mitigation measures have been provided:

- No in-water work will be completed during the spring restricted timing window from March 15 to July 15.
- A sediment control structure and sediment basin shall be installed downstream of the construction activities.
- Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation.

No Federal Species at Risk have been identified within this drainage area that would require special consideration under the Species at Risk Act (SARA).

### 3.3.2 Construction Direction

Attention is drawn to the DFO letter of advice in the Reference Documents. All work is to be done in accordance with the terms in the letter of advice. Relevant mitigation measures are highlighted above and must be followed throughout the project.

## 4.0 Instructions and Process

### 4.1 Pre-Construction Meeting

The Contractor **MUST** arrange an on-site Pre-Construction Meeting with the Engineer, Drainage Superintendent and affected landowners before any equipment or materials are moved onto the site and before any work is commenced on this project.

### 4.2 Notification of Work

The Contractor shall provide notification of the commencement or re-commencement of construction work to Burnside. Notification shall be a minimum ten (10) working days prior to the initiation of the work or a minimum five (5) working days prior to the re-commencement of the work.

Furthermore, the Contractor shall also provide notification of the commencement of in-water work (if required) to the Saugeen Valley Conservation Authority (SVCA) or any other applicable agency(s) at least ten (10) working days prior to the initiation of the work.

### 4.3 Working Space

The area being provided to the Contractor to undertake the work is described herein and the maximum widths are specified on the table entitled 'Working Space'.

<u>WORKING SPACE</u>		
Station	Max. Width (m)	Comments
<u>Main Drain</u>		
-0+030 to 0+000	10 m working space	Access to the <b>Main Drain (Open)</b> will be from Concession 2 South Durham Road to <b>AR#1</b> on the G. Girodat (Roll No. 3-042) property, as shown in the

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<u>WORKING SPACE</u>		
		drawing details. The stilling basin and channel construction shall be along the north/west bank. Spoil levelling shall be to a maximum depth of 300 mm. Excess excavation material shall be removed from the site by the Contractor.
0+000 to 0+085	20 m working space	Access to the <b>Main Drain (Closed)</b> will be from Concession 2 South Durham Road to <b>AR#1</b> on the G. Girodat (Roll No. 3-042) property, as shown in the drawing details.
0+105 to 0+307	20 m working space	Access to the <b>Main Drain (Closed)</b> will be from Sideroad 25 South to <b>AR#2</b> on the J.Russell (Roll No. 3-013) property, as shown on the plan.
<p><b>NOTES:</b></p> <p>(1) The Contractor shall contain their construction operations to as narrow a width as possible, so as to prevent damage to lands, crops, bush, etcetera, and shall not exceed the widths indicated.</p> <p>(2) The Contractor shall be entirely responsible for any damage to lands, crops, etcetera, beyond the widths and locations of both the access routes and the working spaces specified, caused by the Contractor, their Subcontractors or their employees while undertaking the work.</p> <p>(3) The Engineer's approval <b>MUST BE OBTAINED BEFORE</b> exceeding the maximum widths indicated.</p> <p>(4) Access to the working space shall be public roads or as specified. All routes must be approved by the Engineer and Drainage Superintendent prior to construction.</p>		

#### 4.4 Access Routes

The access routes for construction shall be from specified locations on Concession 2 South Durham Road, and Sideroad 25 South to the Drain, as specified in the Table 'Working Space' and on the enclosed Plan. The Contractor shall confirm these access routes with the Engineer, Drainage Superintendent and affected landowners prior to commencing any work.

#### 4.5 Staging of Construction

This project must be staged in the following order of importance to comply with various requirements of the reviewing agencies and the Contract Administrator:

1. **Species at Risk (SAR)** field investigation must be completed prior to any construction if timing windows cannot be avoided for both wooded and field area work (***Restricted from May 1<sup>st</sup> to July 31<sup>st</sup>***).
2. **Fisheries & Oceans Canada (DFO)** – No in-water work shall be completed within the spring timing window (***Restricted from March 15 – July 15***).
3. The sediment control structure (Sta. -0+030), sediment basin (Sta. -0+030 to -0+025), and stilling basin (Sta -0+010 to 0+000) shall be installed prior to any other drain construction.
4. Topsoil stripping along the proposed channel excavation.
5. All channel excavation and erosion protection shall be completed prior to any pipe construction at the discretion of the Contract Administrator. The Contractor shall make every effort to stabilize the excavated channel with vegetation and/or erosion protection immediately following construction. Seeding application timing shall be completed to maximize growth potential and minimize erosion.
6. Topsoil stripping shall be completed prior to any excavation or pipe installation.
7. Every effort shall be made by the Contractor to complete the bored road crossing prior to any other pipe construction.
8. Special attention shall be given by the Contractor to the seeding of all disturbed areas within the construction right-of-way. These areas shall have topsoil replaced and seeding provided as soon as possible following construction to encourage vegetation growth and avoid erosion and invasive species.

The Contractor shall stage the construction to ensure that the site is left each day with appropriate controls to avoid erosion. Any excavated spoil areas shall be protected with silt fence or other measures to avoid erosion during construction, as directed by the Contract Administrator. All channel works shall be completed during periods of low or no flow. Additional erosion measures shall be paid for as extra items on an as directed basis and shall be considered deficient if not completed immediately.

#### 4.6 Construction of the Work

Any issues during construction with respect to errors or omissions with the design drawings or documents, the constructability of the system, etc. must be brought to the attention of the Contract Administrator immediately. It is expected that clear communication will exist between the Contractor and the Contract Administrator and that any discrepancies relating to construction of the work will be remedied immediately. Work resulting from failure to seek clarification with the Contract Administrator by the

Contractor will be the responsibility of the Contractor to remedy at no extra charge to the project and must be completed to the satisfaction of the Engineer prior to demobilization.

#### **4.7 Contract Liquidated Damages**

Any breach of the Contract terms by the Contractor may be subject to daily liquidated damages of \$500 at the discretion of the Contract Administrator. Pertinent examples may include but are not limited to:

- Work outside of timing windows stated in the Contract.
- Deficient work items that can be corrected immediately.

#### **4.8 Final Inspection**

After substantial completion of the work and prior to demobilization and removal of equipment and materials from the site, the Contractor MUST arrange an on-site FINAL inspection of the work with the Engineer. This is to ensure all aspects of the work have been satisfactorily completed and/or that arrangements have been made to expedite the completion of any outstanding minor items or deficiencies. Notification to the Engineer of this Final Inspection shall be provided at least 2 days prior.

#### **4.9 Deficiencies**

Deficient items such as catchbasin markers, grate tabs, rodent grates, additional rip-rap, etc. shall be remedied by the Contractor during the warranty period and paid at the Contract price. If the Contractor fails to complete the work within a reasonable timeframe in the opinion of the Engineer and/or the Municipality, the work shall be completed by a Contractor of the Owner's choosing and the cost of the work deducted from the Contract holdback.

### **5.0 Project Requirements and Existing Conditions**

#### **5.1 Topsoil Stripping**

**Tile Installation:** Unless specified otherwise, prior to installation of the new tile, the Contractor shall strip the topsoil from the area of the proposed tile trench for the entire width of the drainage plow. The topsoil shall be stockpiled separately from native subsoil and subsequently replaced over the backfilled tile trench. This shall be included as part of the work under the appropriate item. An extra payment will not be made for this stripping, stockpiling and replacing of topsoil.

**Channel Work:** Unless specified otherwise, prior to completing work in the channel, the Contractor shall strip the topsoil in the proposed spoil levelling area. The topsoil shall be stockpiled separately from any native subsoil and subsequently replaced over the excavated spoil. This shall be included as part of the work under the appropriate item. An extra payment will not be made for this stripping, stockpiling and replacing of topsoil.



## **5.2 Subsoil Conditions**

Subsoil investigations have been undertaken on this project and summarized in the following sections.

### **5.2.1 Soils Investigation**

A soils investigation was completed both along and adjacent to the proposed drain alignment on November 29, 2016. Various test pits were dug on both the J. Russell property (Roll No. 3-013) and the Gene Girodat property (Roll No. 3-042). The results of the investigation are summarized below, and shown on the accompanying drawing plan.

#### ***J. Russell Property (Roll No. 3-013):***

##### **Test Pits Nos. 1 & 2**

Immediately downstream of the Sideroad 25 South culvert crossing on Lot 56, Concession 3 two test pits (TP1, TP2) were dug to a maximum depth of 1.7 m. A mix of organic soil and topsoil was found from grade to approximately 0.6 m in depth, followed by silty sandy soils to the extent of each test pit. Groundwater was not present in the pit at the time of excavation.

##### **Test Pits Nos. 3, 4, & 5**

Three test pits (TP3, TP4, & TP5) were dug to the south of the existing wetland area in the northern portion of Lot 56, Concession 3 to a maximum depth of 0.5 m. A mix of organic soil and topsoil was found from grade to approximately 0.15 m in depth followed by silty sandy soils to the extent of the test pits. Groundwater was not present in the pit at the time of excavation.

##### **Test Pit No. 6**

One test pit (TP6) was dug near the north property line of Lot 56, Concession 3 immediately to the west of the existing culvert crossing under Concession 2 South Durham Road. This test pit was dug to a total depth of 2.1 m. A mix of organic soil and topsoil was found from grade to approximately 0.15 m in depth, followed by silty sandy soils from 0.15 m to 1.7 m in depth. A grey clay was found from 1.7 m to the extents of the test pit. Groundwater was not present in the pit at the time of excavation.

#### ***G. Girodat Property (Roll No. 3-042):***

##### **Test Pit No. 7**

A test pit (TP7) was dug approximately 20 m north of the downstream end of the CSP culvert crossing the Concession 2 South Durham Road. This test pit was dug to a total depth of 1.0 m. A mix of organic soil and topsoil was found from grade to approximately 0.2 m in depth, followed by very unstable sandy soil to the extent of the test pit. Groundwater was not present in the pit at the time of excavation.

### Test Pits Nos. 8 & 9

A test pit (TP8) was dug in the center of the low run approximately 85 m downstream of the CSP culvert crossing Concession 2 South Durham Road. The test pit was dug to approximately 2.0 m in depth. A very wet silty and clayey soil was found throughout the test pit. Approximately 5 m north of TP8, an additional test pit was dug. This test pit (TP9) was dug to approximately 2.3 m in depth. Dark organic soil was found from grade to approximately 0.4 m in depth, followed by sandy silty soil from approximately 0.4 m to 2.1 m in depth. A grey clay was found from 2.1 m to the extent of the test pit. Groundwater was not present in the pit at the time of excavation but was noted to be seeping into the pit from the excavated banks.

### 5.2.2 Construction

**Channel Excavation.** Based on the soil survey report no. 16 for Bruce County (Ontario Agriculture College 1954) and the associated soils map of Huron County (Reproduced in 1983 by Agriculture Canada) the soil present within the Russell Municipal Drain channel corridor is primarily **Waterloo Sandy Loam and Bottomland** where the channel outlets to the existing natural watercourse.

The Contractor shall tender the channel deepening and widening on the basis of using an excavator and excavating the channel bank and bottom width per the drawing set.

**Tile Installation.** Based on the soil survey report no. 16 for Bruce County (Ontario Agriculture College 1954) and the associated soils map of Huron County (Reproduced in 1983 by Agriculture Canada) the soil present within the closed portion of the Russell Municipal Drain watershed is primarily **Waterloo Sandy Loam**.

The Contractor shall tender the installation of the new pipe on the basis of using a drainage plow; however, as specified in the contingency items, the Contractor shall provide a **replacement** unit price for the installation of HDPE dual-wall (320 kPa) pipe under poor conditions with an excavator as detailed. The Contractor shall specify the **alternative** installation costs for the specified item under the associated contingency item.

## 5.3 Pipe Installation

### 5.3.1 Installation Method

Installation of all new pipe shall be by drainage plow unless specified otherwise.

### 5.3.2 Alternative Installation Method

The alternative installation method may be proposed and bid accordingly by the Contractor at the time of submission.

Closed sections of the drain specified to be installed by drainage plow may alternatively be installed using an excavator and installing 375 mm dia. dual-wall HDPE (320 kPa) pipe on a minimum depth of 150 mm of 19 mm dia. clear crushed stone (or approved equal).

The stone shall be used to achieve pipe gradient and be used as backfill up to the springline of the pipe. Select native material shall be used for the remaining backfill of the pipe trench. No extra payment shall apply per item when the Contractor specifies this method at the time of bidding.

#### 5.4 Stone Removal and Plow Downtime

When large boulders or stony areas force the removal of the plow for cleanout and stone removal prior to recommencing with the plow, the Contractor shall be paid a fixed sum as a contingency for each time this takes place between periods of continuous installation.

The Contractor shall keep a detailed list and time of each instance and review each pullout of the plow with the Contract Administrator daily. The Contractor shall submit a weekly summary of the plow removals via e-mail to the Contractor Administrator. Stones or obstructions causing the plow removal shall be kept to the side of the trench as evidence for the Contract Administrator for the wheel removal.

Pullouts of the plow without sufficient evidence from the Contractor shall not be paid under this item at the discretion of the Contract Administrator.

**NOTE:** *In cases where the plow is removed to immediately switch to a special installation technique, the contingency for stone removal will not apply. Under this scenario, the additional contingency payment for the applicable alternate installation method will be applicable only.*

*All costs associated with the removal of the drainage plow, due to stony and/or poor soil conditions, and installation by excavator shall be included in the additional contingency price. No extra payment will be made for the removal of the drainage plow, crew downtime, or other costs for this transition.*

#### 5.5 Special Installation Techniques (Poor Trenching Conditions)

If stony conditions (Option 'A') or high-water table (Option 'B') are encountered during construction where, in the opinion of the Contractor, it is not feasible to use the plow, the Contractor shall immediately inform the Contract Administrator to obtain approval to switch to:

##### a) Stony Conditions:

Installation on a minimum depth of 150 mm of 19 mm dia. clear crushed stone (or approved equal), backfilled to the pipe springline per the accompanying detail.

The Contractor shall then be paid the line item associated with this section and the additional installation cost specified under the associated contingency item.

The Contractor shall keep a list of stations where these installation techniques were used, to be confirmed with the Contract Administrator on a daily basis and shall submit a weekly summary via e-mail to the Contractor Administrator.

In instances where the installation method specified on-site by the Contract Administrator exceeds the cost of the contingency methods bid, the Contractor shall provide unit pricing for the additional cost to the Contract Administrator within one (1) working day.

The Contractor may only switch to the alternate installation technique when necessary and when approved by the Contract Administrator. When soil conditions are again favourable in the opinion of the Contractor and the Contract Administrator, the plow must again be used for tile installation as soon as possible. Failure to use the plow for installation when soil conditions are favourable in the opinion of the Contract Administrator may result in the extra payment for the given special installation method being deducted from the installation price.

**NOTE:** All costs associated with the removal of the plow, due to large stones, stony and/or poor soil conditions, as required for continued pipe installation with the plow or as required for pipe installation with an excavator shall be included in the associated bid or contingency items. All costs are to be included in the associated contingency costs as bid and no extra payment will be made for the removal of the plow, crew downtime, or other costs for this transition.

## 5.6 Private Systematic Drainage Systems

The Contractor is advised that at the time of submission of this Report, that various private drainage systems exist in the area of the installation of the proposed drain.

The location of existing private drainage systems shall be discussed at the Pre-Construction meeting and existing systems affected by the drain shall be located by the Contractor and reviewed with the Engineer and affected landowners prior to construction.

## 5.7 Utilities Investigation

A utilities investigation was undertaken during the design stage to determine possible elevation conflicts prior to the time of construction.

- A telephone cable was located within the Concession Road 2 South Durham Road right-of-way, to the north of the road surface.
- No other utility conflicts were found during our investigation.

The proposed drain has been designed to ensure that adequate separation exists between the drain and the utilities, however, all public and private utilities shall be

located by the Contractor prior to the construction of the proposed drain and utilities may require staff on-site during construction.

All utility locating and excavation shall be completed through coordination with the utility and in conjunction with all requirements outlined by the utility. Specialized equipment such as soil hydro-vacuum trucks shall be included in the associated item to the utility crossing.

## **6.0 General Construction**

### **6.1 General**

The following general conditions and requirements apply to this project:

- Install, maintain and remove any temporary sediment control measures as specified and/or directed by the Contract Administrator, Drainage Superintendent or the Conservation Authority.
- Spreading and levelling of excavated material, or disposal of all waste material off-site as directed by the Contract Administrator.
- Seeding of all disturbed areas within the right-of-way of the Russell Municipal Drain, Concession 2 South Durham Road, and Sideroad 25 South. All disturbed areas including areas within municipal drain ROW, the Concession 2 South Durham Road, and Sideroad 25 South ROWs, and all berms, shall be seeded with an approved seed mixture or as directed by and to the satisfaction of the Contract Administrator.
- Installation of the new pipe by drainage plow unless specified otherwise by the Engineer.
- Supply and place a minimum of 1.0 m width of rip-rap and geotextile on all sides of all catchbasins.
- Restore and rehabilitate the entire site and each access route to its pre-construction condition(s) or better.
- Post-construction restoration of the working area shall be to the satisfaction of the Contract Administrator.
- Any installed pipe shall be uncovered at minimum 25 m intervals along its length to have the location and elevation confirmed by the Contract Administrator.
- All pipe connection points in and adjacent to the identified wetland shall be watertight. This applies to both pipe to pipe and pipe to structure connections.

### **6.2 Directional Berms**

Directional Berms shall be installed with catchbasins where noted. Typical berm height shall be 500 mm, top width of 300 mm, sideslopes of 1.5H:1V and length of 10 m, to the satisfaction of the Contract Administrator. The catchbasin rip-rap shall extend to form a small spillway over the directional berm (per the accompanying detail).

Directional berms shall be constructed of material containing suitable clay content to allow for direction of overland flow to catchbasins and are intended for minor ponding only.

### **6.3 Plastic Drainage Tubing (PDT) (Section E.2.3.1)**

All PDT installed under these specifications shall be manufactured in accordance with the latest revision of the Drainage Guide for Ontario, as published by the Ministry of Agriculture, Food, and Rural Affairs.

All PDT shall be single wall drainage tubing (Ideal Pipe - HDPE drainage tubing or approved equal) and have a minimum pipe stiffness of 210 kPa and shall be solid pipe.

## **7.0 Description of Work**

The specific items listed here are in addition to those described in the *Estimate of the Cost of Work* (Appendix B) and the *Standard Drain Specifications* (Appendix E). The numbering of each item references the corresponding item in the *Estimate of the Cost of Work*.

### **SECTION A– Main Drain**

#### **A2a. Channel Construction**

**(Sta. -0+030 to Sta. -0+010)**

**General.** The channel bottom width and side slopes shall be excavated as described in the attached drawing set and to the satisfaction of the Contract Administrator.

A 10 m right-of-way has been provided on the north/west channel bank for access and working space. Spreading and levelling of spoil shall be completed within the working ROW to a maximum depth of 300 mm, however the spoil shall not be spread within 2 m from the top of the ditch bank.

During construction, surplus excavated subsoil material or material deemed unsuitable by the Contract Administrator for spreading in the ROW shall be loaded and trucked off-site by the Contractor for disposal and paid for at an additional cost or contingency as contracted.

Topsoil shall be stripped prior to the spoil being placed and spread back over the leveled spoil. The disturbed area shall then be seeded with an approved grass seed mixture (or approved equivalent). Vegetation growth to the satisfaction of the Contract Administrator must be observed prior to payment of the item.

**A2b. Sediment Control Structure****(Sta. -0+030).**

**Location:** A temporary sediment control structure shall be constructed at the end of the proposed channel work (Sta. -0+030), immediately downstream of the permanent sediment basin and immediately upstream of the confluence of the Russell Municipal Drain and the existing natural watercourse. This shall be completed prior to any other sitework and construction shall be to the satisfaction of the Contract Administrator and the Drainage Superintendent.

**Sediment Control Structure:** The sediment control structure shall be constructed using three (3) lengths of 300 mm dia. treated woodchip sediment control socks (FILTREXX SILTSOXX or approved equal) and anchored into each side bank and the channel bottom to control channel baseflows. The socks shall be spaced approximately 4 m apart from one another, to allow for accumulated sediment cleanout with an excavator.

Rounded river stone shall be used to create check dams at each sock and to additionally anchor the socks (see accompanying drawing detail). Construction shall be to the satisfaction of the Contract Administrator and the Drainage Superintendent.

- Rounded river stone on the sediment control structure:
  - $D_{50}$  = 300 mm dia.
  - $D_{100}$  = 600 mm dia.
  - Approximately 300 mm minimum depth over the structures.

The sediment control structure shall be left in place for a period of one (1) year following the substantial completion of the drain and after that time, the bio-filters and accumulated sediment shall be removed, and the river stone formed into a shallow riffle structure by the Contractor.

**In addition to the warranty holdback, an additional \$1,000 shall be held until the temporary sediment control structure has been removed. If removal does not occur in an acceptable timeframe, as determined by the Engineer, another Contractor shall be retained to complete the work using this holdback.**

**A2c. Permanent Sediment Basin****(Sta. -0+030 to Sta. -0+025).**

**Location.** A permanent sediment basin (approximately 5 m in length and 600 mm deep) shall be constructed immediately upstream of the sediment control structure at Sta. -0+030; or where directed by the Contract Administrator. This shall be completed prior to any other sitework and construction shall be to the satisfaction of the Contract Administrator and the Drainage Superintendent.

**Maintenance.** When necessary, during and at the completion of the project and/or when instructed by the Contract Administrator, the Contractor shall remove and spread any accumulated sediment within the working ROW.

The dug sediment basin shall be left in place permanently following the construction of the drain and thereafter shall be maintained by the Drainage Superintendent.

**A2d. Stilling Basin**

**(Sta. -0+010 to Sta. 0+000).**

A permanent stilling basin (Sta. -0+006 to Sta. 0+000) and spillway (Sta. -0+010 to Sta. -0+006) shall be installed immediately downstream of the outlet pipe at Sta. 0+000 as per the accompanying details to the satisfaction of the Contract Administrator.

The basin shall be lined with approximately 20 m<sup>2</sup> of rounded river stone in the base of the stilling basin and spillway from Sta. -0+010 to Sta. 0+000 per the accompanying detail in the drawing set.

- Rounded river stone in the channel bottom:
  - D<sub>50</sub> = 300 mm dia.
  - D<sub>100</sub> = 600 mm dia.
  - 600 mm depth.

Additionally, approximately 60 m<sup>2</sup> of R-50 quarry stone rip-rap (OPSS MUNI1004) complete with geotextile underlay shall be installed a minimum of 2 m diagonally on the basin banks from Sta. -0+010 to Sta. 0+000 and to the top of the outlet bank as erosion protection per the accompanying detail in the drawing set.

- R-50 quarry stone rip-rap (OPSS MUNI 1004) on the basin banks:
  - D<sub>50</sub> = 210 mm dia.
  - D<sub>100</sub> = 305 mm dia.
  - 450 mm depth complete with geotextile underlay.

The banks of the stilling basin and spillway shall be sloped at 2H:1V to match existing grade.

**A3. Outlet Pipe**

**(Sta. 0+000 to Sta. 0+006)**

One 6 m length of 450 mm dia. bell & spigot solid dual-wall (320 kPa) HDPE outlet pipe shall be connected to the proposed 375 mm dia. PDT. The bell joint connection with the two pipes shall be wrapped in a minimum 0.6 m width of geotextile (Terrafix 200R or equivalent).



A rodent grate shall be installed on the outlet of the pipe. The bank slopes at the outlet pipe shall be excavated 2H:1V and be lined with OPSS R50 rip-rap.

**A4. (Items A4, A5) – PDT**

**(Sta. 0+006 to Sta. 0+085 and Sta. 0+105 to Sta. 0+307))**

All PDT shall be manufactured in accordance with the latest revision of the Drainage Guide for Ontario, as published by the Ministry of Agriculture, Food, and Rural Affairs.

All PDT shall be single wall drainage tubing (Ideal Pipe - HDPE drainage tubing or approved equal) and have a minimum pipe stiffness of 210 kPa and shall be solid pipe.

Any installed pipe shall be uncovered at minimum 25 m intervals along its length to have the location and elevation confirmed by the Contract Administrator.

All pipe connection points in and adjacent to the identified wetland shall be watertight. This applies to both pipe to pipe and pipe to structure connections from Sta. 0+105 to Sta. 0+307 and/or as directed by the Contract Administrator.

**A6. Concession 2 South Durham - Offset DICB**

**(Sta. 0+085)**

A ditch inlet catchbasin shall be installed directly downstream of the outlet of the existing culvert crossing Concession 2 South Durham Road. The catchbasin shall be installed with a directional berm and rip-rap spillway as per the accompanying details.

The ditch inlet catchbasin shall be connected to the proposed observation box at Sta. 0+085 with approximately 6 m of 250 mm dia. dual-wall HDPE (320 kPa) pipe. The minimum grade of the connection pipe shall be 0.50%.

**A7. (Items A7, A9) - Concession 2 South Durham – Inline OB and DICB**

**(Sta. 0+085 and Sta. 0+105)**

The catchbasins at Sta. 0+085 and Sta. 0+105 shall be installed on the existing property line and grading shall be completed to ensure positive drainage of surface water to the catchbasins.

Associated directional berms shall be constructed per the accompanying details.

**A8. Concession 2 South Durham – Subsurface Crossing**

**(Sta. 0+085 to Sta. 0+105)**

**General.** The Concession 2 South Durham Road subsurface crossing shall be completed by the jack and bore method. The road crossing shall be completed within one (1) working day.

The location of the proposed boring pit shall be discussed with the Contractor at the pre-construction meeting regarding the existing utilities present. The location of the bore pit for the road crossing is at the discretion of the Contractor. Utility owners shall be advised of the boring projects and accommodated accordingly.

All utilities shall be located and daylighted prior to the boring commencing.

**Traffic Control Plan.** A traffic control plan shall be prepared and submitted to the Municipality of Brockton and the Contract Administrator by the Contractor a minimum of 10 days prior to the proposed start of construction of the bored crossing. *The plan must be approved by the Municipality and implemented by the Contractor prior to the beginning of the crossing construction.*

**Construction.** Topsoil shall be stripped for the entire area of the bore pit, including a 1 m setback and stockpiled. The topsoil shall be redistributed over the backfilled pit following construction.

Any existing tile connections in the bore pit shall be reconnected or connected to the new drain at the discretion of the Contract Administrator and shall be installed on a base of 19 mm (3/4 inch) dia. crushed clear stone on native ground along the entire length of the connection.

**Any voids surrounding the pipe shall be filled with grout by the Contractor during pipe installation and shall be included with the cost of this line item.**

**Note:** *Any settlement or impact caused to the road shall be the sole responsibility of the Contractor, per the Standard Drain Specifications. Any voids surrounding the pipe appearing post construction under the warranty period to the Owner shall be included with the cost of this line item.*

*The Owner of the road ROW shall be contacted by the Contractor regarding any issues pertaining to the pipe installation on their property, prior to leaving the site. Issues shall be remedied to the satisfaction of the Contract Administrator and the Owner.*

#### **A10. Sideroad 25 South – Permeable Inlet Structure**

**(Sta. 0+307)**

**Permeable Catchbasin Installation.** The top of the permeable catchbasin at 0+307 shall be raised approximately 300 mm above the existing field elevation and equal to the outlet road surface culvert invert, to promote ponding and infiltration during melt and rainfall events. The structure will include the DICB and four (4) buried surface water inlets (offset) per the accompanying detail in the drawing set. The installation of the entire permeable CB structure shall be to the satisfaction of the Contract Administrator.

**Buried Surface Water Inlet (BSWI) Installation.** Each of the four (4) BSWIs cells shall consist of approximately 10 m of 200 mm dia. perforated HDPE (320 kPa) dual-wall pipe c/w non-woven geo-textile filter pipe sock.

Each of the two (2) upper pipe cells shall be installed with approx. 4 m<sup>3</sup> of 19 mm dia. clear stone per cell wrapped in geotextile (Terrafix 200R or approved equivalent), c/w an end cap as per the accompanying details in the drawing set. Similarly, each of the two (2) lower pipe cells shall be installed with approx. 4 m<sup>3</sup> of pea gravel stone per cell wrapped in geotextile (Terrafix 200R or approved equivalent), c/w an end cap as per the accompanying details in the drawing set. OPSS R50 rip-rap shall be installed on the surface above the BSWI as per the accompanying details.

The BSWI shall be installed directly in the low area on the east side of the Sideroad 25 South ROW as directed by the Contract Administrator. The BSWI shall be connected to the proposed DICB at the four (4) provided knockouts on the north and south sides of the basin. The slope of each BSWI pipe shall be a minimum of 0.1%.

### **SECTION B – Contingency Items**

This section covers work that may be required for this project. These items shall apply only as and when approved by the Engineer.

#### **B1. Reconnection and/or Connection of Existing Tiles**

*Please refer to the Standard Drain Specifications (E.2.3.4 and E.2.3.5) for additional information.*

**General.** The unit price bid for these items shall include all labour, equipment, and material required to reconnect/connect existing private tile drains encountered during construction to the drain.

Typically, existing private tiles encountered during construction will be reconnected to themselves per the detail in the accompanying drawings. In circumstances where, in the opinion of the Engineer, reconnection is not possible, private tiles may be connected to the new drain as noted and with the downstream side of the existing tile capped.

**Reconnections (Section E.2.3.4).** The unit price bid for this item shall include the reconnection of existing private tile drains encountered during construction across the trench to themselves, above the new Municipal Drain tile. Included in this price shall be all labour equipment and material required to support the tile connection above the new drain, consisting of OPSS 19 mm clear crushed stone under the connection to undisturbed native soil, and connection of the tile using solid dual-wall (320 kPa) HDPE pipe (or approved equal) across the trench as per the detail in the accompanying drawings.

**Connections (Section E.2.3.5).** The unit price bid for this item shall include all labour equipment and material required to connect existing private tile drains

encountered during construction, to the new municipal drain. Installation shall include appropriately sized dual-wall (320 kPa) HDPE pipe, connected to the new pipe using a core drilled hole and manufactured HDPE coupler fitting, including backfill with OPSS 19 mm clear crushed stone under the connection to undisturbed native soil and a minimum of 300 mm over top of the connection as per the detail in the accompanying drawings. Connections directly into the new drain without the use of a coupler will not be permitted.

**Structure Connection.** Existing tile drains shall be connected primarily to catchbasins through the provided knockouts when possible. Any proposed direct connections to the new municipal drain in the vicinity of catchbasins shall be approved by the Engineer prior to being installed.

**Missed Reconnection/Connections.** Missed connections and/or reconnections during construction shall be completed by the Contractor during the warranty period and paid at the Contract price. If the Contractor fails to complete the connection and/or reconnection within a reasonable timeframe in the opinion of the Engineer and/or the Municipality, the work shall be completed by a Contractor of the Engineer's choosing and the cost of the work deducted from the Contract holdback.

**B2. R-50 Rip-Rap Erosion Protection (OPSS MUNI 1004)**

For the unit price bid per square metre, the Contractor shall supply and install a 450 mm thickness of R-50 quarry stone rip-rap with geotextile underlay (OPSS MUNI 1004). These unit prices shall be used for payment for any rip-rap installed in addition to those quantities already specified in other items and for credit for any quantities of rip-rap deleted from other items.

- R-50 quarry stone rip-rap (OPSS MUNI 1004):
  - D<sub>50</sub> = 210 mm dia.
  - D<sub>100</sub> = 305 mm dia.
  - 450 mm depth complete with geotextile underlay.

Additionally, this will include areas of existing channel bank where erosion or bank slumping has occurred, as directed on-site by the Contract Administrator.

**B3. 19 mm dia. Clear Crushed Stone (OPSS MUNI 1004)**

For the unit price bid per tonne, the Contractor shall supply 19 mm (3/4 inch) dia. clear crushed stone. These unit prices shall be used for payment for any 19 mm clear crushed stone installed in addition to those quantities already specified in other items and for credit for any quantities of 19 mm clear crushed stone deleted from other items.

**B4. Granular B Material (OPSS MUNI 1010)**

For the unit price bid per tonne, the Contractor shall supply Granular B material. These unit prices shall be used for payment for any Granular B material installed

in addition to those quantities already specified in other items and for credit for any quantities of Granular B deleted from other items.

**B5. Special Installation Techniques (Poor Soil Conditions)**

**Dual-Wall (320 kPa) HDPE Pipe**

The Contractor shall install watertight bell and spigot 375 mm dia. solid HDPE dual-wall (320 kPa) pipe on a 150 mm depth of 19 mm (3/4 inch) diameter clear crushed stone and backfill to the springline as described in the schedule of unit prices per the detail in the accompanying drawings, with a hydraulic excavator.

The Contractor shall note that this unit price **replaces** the price bid for the applicable pipe items in other sections. This item shall be used only when the soil conditions encountered are such that a drainage plow cannot, in the opinion of the Contract Administrator, be used effectively to install the pipe. The Contractor must receive approval from the Contract Administrator prior to using this technique.

The installation shall be in accordance with the detail provided in the accompanying drawings, unless alternatively directed by the Contract Administrator.

## G. ARTICLES OF AGREEMENT

**Russel Municipal Drain  
Contract No. 300038962.0000**

THIS AGREEMENT made the 11 day of February 2020

BY AND BETWEEN:

Van Gorp Farm Drainage Ltd.

(herein and throughout the Contract Documents  
called the "Contractor")

- and -

**MUNICIPALITY OF BROCKTON**

(herein and throughout the Contract Documents  
called the "Owner")

WITNESSETH

That the Owner and the Contractor in consideration of the fulfilment of their respective promises and obligations herein set forth covenant and agree with each other as follows:

### ARTICLE I

- (a) This Agreement applies to the supply of all labour, material and equipment necessary to complete the Work as set out in this Contract.
- (b) This Agreement, together with the documents listed in clause 3.2 of Document A of the Bid Documents constitute the "Contract" and are to be read herewith and form part of the Contract as fully and completely to all intents and purposes as though all the stipulations thereof had been embodied herein.
- (c) The date from which this Contract is to be in force is the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

(d) Interest

- (i) Subject to GC 8.02.04.09, Interest for Late Payment and GC 8.02.04.10, Interest for Negotiations and Claims, should either party fail to make payments as they become due under the terms of the Contract or in an award by arbitration or court, interest at a variable nominal rate per annum equal on each day to the Bank Rate then in effect plus one and one-half percent (1.5%) on the outstanding payment shall also become due and payable until payment.
  - (ii) Subject to GC 8.02.04.09, Interest for Late Payment and GC 8.02.04.10, Interest for Negotiations and Claims, interest shall apply at the rate and in the manner prescribed by the preceding section on the amount of any claim advanced and for which the Contractor is thereafter entitled to payment, either pursuant to GC 3.13, Dispute Resolution of the General Conditions, or otherwise, from the date the amount would have been due and payable under the Contract, had it not been in dispute, until the date it is paid.
- (e) The Contract supersedes all prior negotiations, representations, or agreements, either written or oral, relating in any manner to the Work, including the Bid Documents that are not expressly listed as forming part of the Contract Documents. The Contract may be amended only as provided in the Contract Documents. The Contract Documents shall ensure to the benefit of and be binding upon the parties hereto, their respective successors and permitted assigns.

## ARTICLE II

### THE CONTRACTOR UNDERTAKES AND AGREES:

- (a) To do all the work and furnish all the labour, equipment, materials, tools, plant, appliances and transportation necessary or proper for the performing and completing of the Work, as set forth in the Contract Documents, and in the manner and within the time specified in the Contract Documents and otherwise do and fulfill everything indicated by the Contract Documents.

The Contract Documents are intended to cover and provide for proper completed work in all respects, and everything necessary to carry out this intent which may reasonably be implied from the Contract Documents must be done by the Contractor, even if not explicitly referred to.

- (b) The Contractor shall guarantee the Work free from any defects in materials and workmanship under normal operating conditions throughout the Warranty Period as defined in the Contract.
- (c) The decision of the Contract Administrator is to be final and binding on the Contractor and the Owner as to the nature and cause of any defects and deficiencies in the Work and as to the remedy required for each and as to which party shall bear the cost of such remedy. Failure to comply with the directions of the Contract Administrator within forty-eight (48) hours after written notice may result in the Contract Administrator having the work performed by others and the cost thereof being deducted from the amount due to the Contractor.
- (d) To furnish the following:
  - i) Tender Deposit and Contract Security.
  - ii) Evidence of all Insurance required by the Contract Documents.
  - iii) Current Clearance Certificate from the Workplace Safety & Insurance Board (WSIB).
- (e) The Contractor hereby acknowledges and agrees that the cost of any item of work reasonably inferred to be necessary for proper completion of the Work, yet not specifically listed in the Schedule of Unit Prices is considered to be incorporated in the prices that are listed in Schedule of Unit Prices. The Contractor further acknowledges and agrees that the prices listed in Schedule of Unit Prices include, without limitation, duties, taxes, royalties, permits, customs, insurance, contract security, handling, transportation, overhead, profit and all other charges and expenses, except only for the Value Added Tax.



- (f) The Contractor also acknowledges and agrees that:
  - (i) The estimated quantities in the Schedule of Unit Prices are only approximate and are not a representation, warranty or guarantee of the number of units of each item that will be a part of the Work and the measured quantities of completed work or materials may vary from such estimated quantities. Such variation will not invalidate the Contract or the prices in Schedule of Unit Prices and the Owner shall have no liability or obligation to the Contractor in regard to such variation including, without limitation, incidental, consequential, direct, loss of profits, loss of opportunity, loss of good will, loss of revenue, special or other damages.
  - (ii) With the exception of the lump sum amounts for completed items set out in Schedule of Unit Prices, payment will only be made for the actual measured quantities of completed work performed or materials furnished as a part of the Work, as determined in accordance with the Contract Documents.
- (g) These amounts may be subject to adjustments as provided in the Contract Documents.
- (h) As such payments become due, the Contractor shall, in accordance with the terms of its agreements with any Subcontractors, pay all of its Subcontractors in full on account of work properly performed or Materials properly supplied, as applicable, less any holdback monies retained in compliance with the *Construction Act* (Ontario).

### ARTICLE III

#### THE OWNER UNDERTAKES AND AGREES:

- (a) The Owner shall pay Contractor, for the performance of the Work, in accordance with the Contract Documents, the following:
  - (i) for the completed lump sum components of the Work, the lump sum amounts set out in Schedule of Unit Prices; and
  - (ii) for the completed unit price components of the Work, the aggregate amount of the actual number of units of measurement of each item multiplied by the appropriate unit price that is set out in the Schedule of Unit Prices.
- (b) Subject to, and in accordance with, the provisions of the Contract Documents, and the *Construction Act* (Ontario), the Owner shall:
  - (i) Make monthly progress payments to the Contractor on account of the Work performed when due in the amount certified by the Contract Administrator together with such Value Added Taxes as may be applicable to such amount certified by the Contract Administrator;
  - (ii) Upon Substantial Performance of the Work, pay to Contractor eighty percent (80%) of the statutory holdback (i.e., eight percent (8%) of the value of completed work) in respect of Work performed up to the date of Substantial Performance when due together with such Value Added Taxes as may be applicable to such payment.
  - (iii) The holdback amount for the warranty period will be \$2,500 or twenty percent (20%) of the statutory holdback, whichever is greater.
  - (iv) Upon the expiry of the Warranty Period, and rectification of all deficiencies and required completion of incomplete Work, pay to Contractor the remaining amount of the statutory holdback (i.e., two percent (2%) of the value of completed work) in respect of the Work performed up to the date of Substantial Performance, which the Owner has retained, when due together with such Value Added Taxes as may be applicable to such payment.

#### ARTICLE IV

All communications in writing between the parties or between them and the Contract Administrator shall be deemed to have been received by the addressee if sent to:

The Contractor at: *Van Corp Farm Drainage Ltd.*  
"[Contractor Name]"  
"[Attention]" *John Van Corp*  
"[Street No & Name]" *12709 Imperial Rd.*  
"[City & Province]" "[Postal Code]" *Springfield, On. N0L 2J0*  
Or by fax "[Fax]" *519-765-4730*  
Or by email "[email address]" *mvr.vangrpdrainage@amtelecom.net*

- and to the Owner at:

Municipality of Brockton  
Fiona Hamilton, Clerk  
100 Scott Street, P.O. Box 68  
Walkerton ON N0G 2V0  
Or by fax 519-881-2991  
Or by email fhamilton@brockton.ca

- and to the Contract Administrator at:

R.J. Burnside & Associates Limited  
Ed DeLay, M.Eng., P.Eng.  
449 Josephine St., P.O. Box 10  
Wingham ON N0G 2W0  
Or by fax 519-357-3624  
Or by email ed.delay@rjburnside.com

## ARTICLE V

This Agreement shall ensure to the benefit of and be binding upon the parties hereto and their respective successors, executors, administrators and assigns. Note that the use of seals, while encouraged when available, is not mandatory.

IN WITNESS WHEREOF the Contractor and the Owner have respectively affixed their corporate seals and the hands of their proper officers on or about the day and year first above written.

Van Gorp Farm Drainage Ltd  
Contractor

John Van Gorp  
For the Contractor/Signature & Seal

February 14/20  
Date Signed

Tracy Ann Roestel  
Witness

## MUNICIPALITY OF BROCKTON

\_\_\_\_\_  
Owner

\_\_\_\_\_  
For the Owner/Signature & Seal

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

\_\_\_\_\_  
Witness