

# **The Corporation of the Town of Tecumseh**

## **By-Law Number 2023 - 034**

Being a bylaw to provide for the repair and improvements to the 10th Concession Drain

**Whereas** the Councils of the Corporation of the City of Windsor as the initiating municipality and the Corporation of the Town of Tecumseh as an affected municipality have been requested to provide for the repair and improvement of the 10th Concession;

**And Whereas** the City of Windsor as the initiating municipality procured a Drainage Report for the 10th Concession Drain and specifications from the consulting engineering firm of Dillon consulting Limited, dated March 16, 2015 (hereafter "Drainage Report");

**And Whereas** a Public Meeting of Council was held by the City of Windsor on Tuesday, April 7, 2015, at 6:00 pm, to hear from any affected property owners on the Drainage Report;

**And Whereas** the Council of The Corporation of the Town of Tecumseh is of the opinion that the repair and improvement of the 10th Concession is desirable.

**Now Therefore the Council of The Corporation of The Town of Tecumseh Enacts as follows:**

1. **That** the Drainage Report providing for the repair and improvement of the 10th Concession, dated March 16, 2015, as prepared by the consulting engineering firm Dillon consulting Limited and attached hereto as Schedule "A" to this by-law, is hereby adopted and the drainage works as therein indicated and set forth is hereby approved and shall be completed in accordance therewith.
2. **That** the Treasurer, subject to the approval of Council, may agree with any bank or person for temporary advances of money to meet the costs of construction pending the completion of the drain and grants and computed payments are received.
3. **That** the Town may issue debentures for the amount borrowed and the amount of such debentures shall be reduced to the total amount of:
  - a) Grants received under Section 85 of the said Act;
  - b) Commuted payments made in respect of land and roads assessed.
4. **That** such debentures shall be made payable within five (5) years from the date of the debenture and shall bear interest at a rate as approved by resolution of Council.

5. **That** the specifications and General Specifications as established are adopted as set out in the Drainage Report which forms part of this by-law.
6. **That** the Mayor and Clerk are authorized to cause a contract for the construction of the works to be made and entered into with some person or persons, firm or corporations, subject to the approval of the Council to be declared by resolution.
7. **That** this by-law shall come into force upon and after the final passing thereof.

**Read** a first, second, third and final readings on this 14th day of March, 2023.

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Gary McNamara, Mayor

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Robert Auger, Clerk

DRAINAGE REPORT FOR THE

**10<sup>TH</sup> CONCESSION DRAIN**

**CITY OF WINDSOR & TOWN OF TECUMSEH**



(FINAL – COUNCIL CONSIDERATION)

**16 MARCH 2015**

**CHRISTOPHER D. THIBERT, P.ENG.**

FILE NO. 13-8559

File No. 13-8559

Mayor and Council of  
The Corporation of the City of Windsor  
350 City Hall Square West  
Windsor, ON  
N9A 6S1

**Drainage Report for the  
10<sup>TH</sup> CONCESSION DRAIN  
City of Windsor & Town of Tecumseh**

Gentlemen:

**Instructions**

We hereby submit our report recommending the repair and improvements to the 10th Concession Drain. A request was received by the City of Windsor on 12 August 2013 from the landowner of property Roll No. 090-030-06600 located on Lots 4 to 41, Lots 48 to 85, Lots 89 to 173, Plan 1351 in the former Township of Sandwich South, now within the City of Windsor, for the repairs and improvements to the 10<sup>th</sup> Concession Drain. Council accepted the request under Section 78 of the Drainage Act and on 18 November 2013 appointed the undersigned to prepare a report recommending the improvements to the 10<sup>th</sup> Concession Drain starting from the upstream end of the drain located within the City of Windsor and Town of Tecumseh and proceeding downstream to its outlet into Sullivan Creek within the Town of Tecumseh to obtain a sufficient outlet.

In addition to the original request, a recommendation by Dillon was presented to the Town of Tecumseh Road Authority and Drainage Superintendent to relocate the open drain away from the travelled portion of Baseline Road between Sullivan Creek and County Road 43 (also known as 11<sup>th</sup> Concession Road). This recommendation was based on visual and survey data obtained during the initial inspection of the drain and the findings outlined below in existing conditions. The Town of Tecumseh Road Authority accepted this recommendation and requested that design and details be provided in this report for the drain relocation under Section 77(2) of the Drainage Act.

**Watershed Description**

The 10<sup>th</sup> Concession Drain consists of an open drain along the south side of Baseline Road and along the blind line in Concession 10. The drain outlets into Sullivan Creek in Lot 16, Concession 11 at a point 756 m east of County Road 43. It then proceeds westerly (upstream) along the south side of Baseline Road to the blind line in Concession 10 where it turns southerly and continues southerly along the blind line across Lots 16 to 13 and terminates at a point approximately 60 metres north of the north limit of Highway No. 401.



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The drain is 3,556 m in length and has an average grade of 0.07%. The watershed is mainly rectangular in shape and has an area of approximately 249 hectares (615 acres). The lands comprising the watershed are under intense agricultural production with cash crops. There are eleven (11) non-agricultural parcels within the watershed. The soils are predominantly Brookston Clay. This soil is poorly drained and requires subsurface drainage to be productive.

### **Drainage History**

A history of recommended work completed on the 10<sup>th</sup> Concession Drain under previous Engineers' reports, is as follows:

- **12 September 1983 by Maurice Armstrong, P.Eng.:** The recommended work on the 10<sup>th</sup> Concession Drain was brushing and cleaning out the entire drain, as well as the lowering of one access culvert.
- **19 February 1968 by C.G.R. Armstrong, P.Eng.:** The recommended work on the 10<sup>th</sup> Concession Drain was cleaning and deepening of the entire drain.

### **Existing Conditions**

Along the section of the 10<sup>th</sup> Concession Drain adjacent to Baseline Road, the top of the northerly bank of the drain is immediately adjacent to the travelled road surface of Baseline Road. The open drain has a depth ranging from 1.2 m to 2.0 m. Areas of significant erosion were observed along the roadside bank of the drain.

From Station 0+000 to Station 0+764, the depth, width, and location of the existing open drain does not permit the Town's Road Authority the opportunity to adequately maintain and protect the road shoulder and travelled surface of Baseline Road. The 10<sup>th</sup> Concession Drain poses a threat to the stability of the road bank, shoulder and road surface, as well as posing a hazard to traffic. Future maintenance of the drain may pose additional threats to the stability of the road bank, shoulder and road surface.

Currently there are four (4) access bridges in the 10<sup>th</sup> Concession Drain. Specific structure numbers have been designated for ease of reference between the specifications and the drawings. The location, dimension, condition and use of each structure are as follows:

#### **Bridge No. 1: Station 1+450 – Town of Tecumseh (Unopened Road Allowance)**

This is a proposed new culvert being used to re-align the drain where the unopened road allowance intersects with Baseline Road. The existing open drain forms a right angled turn as it travels downstream to Baseline Road. At the point of turning, significant erosion and sediment build up was observed creating obstructions and restrictions to flow as well as erosion creeping into the adjacent road allowance.

#### **Bridge No. 2: Station 1+444 – Town of Tecumseh (Unopened Road Allowance)**

A 6 m length of 1200 mm diameter corrugated steel pipe culvert with broken concrete end walls provides access to property Roll No. 520-03400. This culvert is significantly perched above the drain bottom and poses a hydraulic restriction within the drain. Also, in our considered opinion, it is a potential safety hazard for this culvert does not have adequate length to provide the standard minimum 6 meter top width for a residential entrance.

#### Bridge No. 3: Station 1+222 – Daniel and Nancy Ewing (Roll No. 520-03800)

A 5.5 m length of 1200 mm diameter corrugated steel pipe with sacked concrete end walls provides access to this property. This culvert was lowered under the 1983 report. The culvert is deficient in hydraulic capacity based on current rainfall intensity data.

#### Bridge No. 4: Station 0+769 – County Road 43 Crossing

An 8.4 m long rigid span concrete bridge with a span of 6.8 m and a depth of 2.2 m exists under the County Road 43. There are curbs at both ends and concrete wing walls at all four corners of the culvert. This bridge, from a visual inspection only, appears to be in acceptable condition.

#### On-Site Meeting

We conducted an on-site meeting on 20 February 2014. A second on-site meeting was held on 15 May 2014 to discuss the findings from the survey and recommend options for repair and improvement. Records of both meetings are provided in Schedule 'A-1' and 'A-2', which is appended hereto.

A pre-consideration meeting was subsequently held on 5 March 2015 at the Windsor Airport conference room to discuss the draft report for the 10<sup>th</sup> Concession Drain, where an invitation and a copy of the draft report was sent out to each affected landowner within both the Town of Tecumseh and City of Windsor. Following this meeting there were several minor amendments to the report and assessment, some pertaining to landowner comments, as follows:

1. Landowner of Roll No. 520-04500, located within the Town of Tecumseh, noted that the property drains both surface and sub-surface directly to Sullivan Creek which runs through the southeast corner of the property. This was confirmed by tile mapping provided by the landowner and therefore Schedules 'C', 'E-1' and 'E-3' have been revised.
2. Several landowners and the drainage superintendents for both the City of Windsor and Town of Tecumseh were questioning the location of the working corridors and side of the drain for levelling purposes. Clarification in the report was made and a description of the working areas has been added to the overall plan.
3. Several landowners expressed concerns of the future replacement of Bridge No. 2 (existing 1200 mm diameter CSP culvert). It was determined that a 600 mm diameter culvert was sufficient for future replacement but the landowners requested that a 1200 mm diameter culvert be put back when it comes time for replacement. At this time, the Town of Tecumseh has agreed to this and will conduct a meeting with the affected landowners at the time of replacement to agree upon a desired size.
4. Landowner of Roll No. 520-03901, located within the Town of Tecumseh, requested to be on record with the question to why Baseline Road can't be moved north to keep the drain in the same location from Station 0+000 to Station 0+764. An explanation was provided by the engineer with instructions to contact the engineer looking over the road improvements.

## Survey

Our examination and survey of the 10<sup>th</sup> Concession Drain was carried out on 28 April 2014. The survey comprised the recording of topographic data and examining the channel for available depth necessary to provide sufficient drainage. There is a uniform build up of sediment averaging 200 mm to 500 mm above the design bottom. Erosion of the drain banks was observed at various locations along the course of the drain.

We commenced the survey of the drain at the outlet into Sullivan Creek on the south side of Baseline Road. The survey then proceeded westerly along the south side of Baseline Road to and across County Road 43 at Station 0+769 and then continuing upstream (westerly) to the blind line, which is a division line between Concessions, in Concession 10. The survey then turned southerly at Station 1+450 along the said blind line and continued to the end of the drain at a point approximately 60 metres north of the north limit of Highway No. 401.

## Design Considerations

The Design and Construction Guidelines under the Drainage Act recommend that open drainage systems be designed to effectively contain and convey the peak runoff generated from a storm event having a frequency of occurrence of once in two years. This standard was applied to all open drain alternatives in this case.

The Design and Construction Guidelines also recommend that private drain crossings and enclosures installed in open drains be designed to freely pass the peak runoff generated from a storm event having a frequency of occurrence of once in two years. This standard was applied in the design of the private access bridges.

We believe that these design standards should provide a reasonable level of service, but it should be clearly understood that runoff generated from large storms or fast snow melts may sometimes exceed the capacity of the proposed systems and result in surface ponding for short periods of time.

## Allowances

In accordance with Sections 29 and 30 of the Drainage Act, we have made a determination of the amount to be paid for damages to the lands and crops within the designated working corridors and for land taken in the improvements to the drain and the establishment of a permanent 1.0 m wide grass buffer strip along the entire length of the drain. The average land cost for the surrounding area used to calculate the value of land taken is \$22,000.00 per hectare (\$8,900.00 per acre). The allowances for damages within the working corridor including the 9.0 m wide topsoil storage area is based upon a rate of \$3,707.00 per hectare. Schedule 'B' shows the distribution of these allowances.

Part A - Drain Relocation Between Sullivan Creek and County Road 43 - A strip of land having a width from 10.0 m to 12.2 m would be required to shift the alignment of the drain away from the travelled portion of the road from Station 0+016 to Station 0+764. The area required is 0.82 ha (2.03 acres). The area required for the grass buffer strip is 0.075 ha (0.19 acres). The total area required is 0.895 hectares (2.21 acres). In accordance with Section 29, we recommend that a land allowance of \$19,690.00 be provided for these lands.



Excavated material would be used to fill the old course with all surplus material to be hauled off-site. No material would be placed and spread on the adjoining farmlands. In accordance with Section 30, we have made a determination, shown in Schedule 'B', of the amount to be paid for damages to the lands and crops (if any) occasioned by the operation of equipment within the designated working corridor across properties along the south side of the drain from the outlet to County Road 43.

Part B - Drain Clean Out Between County Road 43 and the Head of the Drain at Station 3+537 - A strip of land 1.0 m wide is required for the grass buffer strip along this section of drain. The area required is 0.25 hectares (0.61 acres). In accordance with Section 29, we recommend that a land allowance of \$5,540.00 be provided for these lands.

For the section of drain to be cleaned out only (from County Road 43 to the head of the drain) in accordance with Section 30 of the Drainage Act, we have made a determination of the amount to be paid for damages to the lands and crops (if any) occasioned by the operation of equipment and the disposal of material excavated from the drain within the designated working corridor across properties along the south side of the drain (from County Road 43 to Station 1+465) and along the east side of the drain from Station 1+465 to the head of the drain (Station 3+537). Throughout the length of the work, the excavated material is to be disposed of as set out in the Special Provisions in Schedule 'F' herein. The allowance for damages is calculated at a rate of \$3,707.00 per hectare (\$1,500.00 per acre). Schedule 'B' shows the distribution of these allowances for a corridor area designated to be 9.0 metres wide for the placement of fill during the excavation of the drain. The area exposed to damages represents approximately 2.22 hectares (5.49 acres).

### **Recommendations and Cost Estimate**

Based on our review of the history, the information obtained during the site meetings, pre-consideration meeting, and our examination and analysis of the survey data, we recommend that the 10<sup>th</sup> Concession Drain be repaired and improved as follows:

The section of drain between Sullivan Creek and County Road 43 cannot be adequately maintained or improved in its present location along Baseline Road without having negative impacts on the road shoulder and road surface. We recommend that the section of open drain from Station 0+000 to Station 0+756 be relocated away from the road onto private property to protect the road and permit future drainage improvements. The new north top of bank from Sullivan Creek to County Road 43 (Station 0+000A to Station 0+748A) shall be located approximately 3.5 m south of the existing south top of bank to keep clear of the hydro line along the drain.

We also recommend that the bottom of the drain between County Road 43 and the head of the drain (Sta. 0+764 to Station 3+537) be cleaned out with repairs and/or improvements to access bridges as follows:

- Bridge No. 1: Station 1+450 – Town of Tecumseh (Unopened Road Allowance) - We recommend that a new 23 m long, 1780 mm x 1360 mm aluminized corrugated steel pipe arch (CSPA) with sloped stone end walls be installed upstream of the existing bridge (denoted as Bridge No. 2) and on a 45 degree angle to the laneway.



- Bridge No. 2: Station 1+444 – Town of Tecumseh (Unopened Road Allowance) - With the recommended diversion of the drain via Bridge No. 1 (which will convey the total volume of water flow in the drain), this 1200 mm pipe is sufficiently large enough as it will be required to accept only storm-water from the west City of Windsor residential properties and Baseline Road to the west limits of the watershed via the south road ditch. We further recommend that the original course of the 10<sup>th</sup> Concession Drain between Bridge No. 1 and Bridge No. 2 be abandoned in accordance with Section 19 of the Drainage Act. Bridge No. 2 and the abandoned drain portion will become the responsibility of the owner of the lands, being the Town of Tecumseh.
- Bridge No. 3: Station 1+222 – Daniel and Nancy Ewing (Roll No. 520-03800) - We recommend the culvert be replaced with a new 15.0 m long, 1600 mm diameter, aluminized corrugated steel pipe (CSP) with a wall thickness of 2.8 mm, 125 mm x 25 mm corrugations and with sloped stone end walls.
- Bridge No. 4: Station 0+769 – County Road 43 Crossing - When the Road Authority does replace this bridge we recommend that the bridge be located southerly to align with a future relocation of the next westerly section of the drain away from the travelled portion of Baseline Road. This will require a new engineer's report since the road will need to acquire private lands for working area to complete bridge work and land taken for the relocated drain.


We further recommend the 10<sup>th</sup> Concession Drain be repaired and improved as described below:

10 <sup>th</sup> CONCESSION DRAIN		
Item	Description	Amount
	<b><u>PART A - DRAIN RELOCATION</u></b> <b><u>(Sta. 0+000- Sta. 0+764)</u></b>	
1.	Tree and brush removal as follows:	
	a) Station 0+000 to Station 0+764 including the disposal by burning on-site or removal off-site. Clearing shall include the removal of all growth between the south edge of gravel of Baseline Road to 15 metres south of the south road limit excluding ornamental trees where possible (very light brushing).	\$3,000.00
2.	Strip and replace topsoil as follows:	

10 <sup>th</sup> CONCESSION DRAIN		
Item	Description	Amount
	a) From Station 0+000A to Station 0+748A strip topsoil over proposed open channel limits and stockpile. Load, haul and place stockpiled topsoil over fill materials on existing drain alignment from Station 0+000 to Station 0+756 upon completion of excavation and levelling (approximately 6,100 m <sup>2</sup> ).	\$4,000.00
3.	Excavation, hauling, filling and compaction of excavated materials, as follows:	
	a) Excavation of new channel on private property from Station 0+000A to Station 0+748A with 2 to 1 side slopes and 1 metre bottom width (approximately 7,050 m <sup>3</sup> ).	\$42,000.00
	b) Remove all vegetation, organic debris and topsoil from the existing drain slopes. Fill existing drain channel from Station 0+000 to Station 0+756 including hauling, filling and compaction of material in 250 mm lifts. Compaction to a minimum of 95% standard proctor density. Any excess materials to be hauled away off-site.	\$25,000.00
4.	Tile outlet repairs from Station 0+000A to Station 0+748A, as follows:	
	<b>Tile outlet drains from the south shall be replaced using 320 kPa smooth wall, high density polyethylene pipes (HDPE). New outlet pipes shall be a minimum 3 metre length of non-perforated pipe complete with rodent grate as follows:</b>	
	a) Replace all existing 100 mm diameter tile ends with 150 mm diameter HDPE pipe. Approximately 3 locations totalling 9 m of 150 mm diameter HDPE pipe.	\$300.00
	b) Replace all existing 150 mm diameter tile ends with 200 mm diameter HDPE pipe. Approximately 1 location totalling 3 m of 200 mm diameter HDPE pipe.	\$150.00
	c) Replace all existing 300 mm diameter tile ends with 375 mm diameter HDPE pipe. Approximately 2 locations totalling 6 m of 375 mm diameter HDPE pipe.	\$400.00

10 <sup>th</sup> CONCESSION DRAIN		
Item	Description	Amount
	d) Replace all existing 375 mm diameter tile ends with 450 mm diameter HDPE pipe. Approximately 1 location totalling 3 m of 450 mm diameter HDPE pipe.	\$250.00
	e) Replace all existing 400 mm diameter tile ends with 450 mm diameter HDPE pipe. Approximately 2 locations totalling 6 m of 450 mm diameter HDPE pipe.	\$700.00
5.	Seeding of drain banks, grass buffer strips and area over old drain, as follows:	
	a) Supply and placement of bonded fibre matrix hydro-seed on new drain banks from Station 0+000A to Station 0+748A (approximately 5,900 m <sup>2</sup> ).	\$29,500.00
	b) Establish 1.0 m wide grass buffer strip beyond the top of bank on the south side of the drain from Station 0+020A to Station 0+748A (approximately 723 m <sup>2</sup> ).	\$3,700.00
	c) Lands between the south edge of gravel of Baseline Road and the north top of bank of the new channel (i.e. over the existing drain from Station 0+000 to Station 0+756 plus the land between the new and existing drain) shall be drill-seeded as per specifications (approximately 7,000 m <sup>2</sup> ).	\$24,500.00
6.	Rock Flow Check Dam (temporary) (OPSD 219.211) – Station 0+012 Supply and install stone erosion protection (SEP) (approximately 30 m <sup>2</sup> ) including new filter fabric underlay beneath a small rock dam constructed across the drain for silt and sediment control measures during construction.	\$2,500.00
7.	Supply and install stone erosion protection on drain bank Station 0+730A to Station 0+747A complete with filter fabric underlay (minimum 300 mm thickness) (approximately 75 m <sup>2</sup> )	\$5,000.00
8.	Supply and install stone erosion protection at outlet into Sullivan Creek complete with filter fabric underlay (minimum 300 mm thickness) (approximately 145 m <sup>2</sup> )	\$9,500.00

<b>10<sup>th</sup> CONCESSION DRAIN</b>		
<b>Item</b>	<b>Description</b>	<b>Amount</b>
9.	Excavation of a 300 mm deep and 1.0 m wide bottom, refuge stilling pool in the new channel below the design gradeline from Station 0+040A to Station 0+050A (10 m). Also included is a 200 mm thick stone rip-rap lining complete with filter fabric underlay.	<u>\$2,000.00</u>
	<b>PART A - SUB-TOTAL</b>	<b>\$152,500.00</b>
10.	Allowances for Part A only - Drain Relocation	\$22,235.00
11.	Engineering for Part A only (cost portion)	\$45,500.00
12.	Contract administration and full time inspection	\$20,000.00
13.	Expenses and incidentals	<u>\$1,000.00</u>
	<b>TOTAL ESTIMATE PART A</b>	<b>\$241,235.00</b>
	<b><u>PART B – DRAIN CLEAN OUT AND CULVERT REPLACEMENTS from County Road 43 (Station 0+764) to head of drain (Station 3+537)</u></b>	
1.	Tree and brush removal from Station 0+774 to Station 3+537 with trimming and/or removal of existing trees within the drain as required to accommodate the drainage works excluding ornamental trees where possible. The work shall include disposal of brush by means of stockpiling and burning where permitted or alternatively trucked off-site.	\$20,000.00
2.	Excavation, trucking and/or levelling of excavated materials, as follows:	
	a) Excavation of the drain bottom as follows:	
	Station 0+774 to Station 3+537, totalling 2,763 metres of drain and approximately 1,230 m <sup>3</sup> of material.	\$23,900.00
	b) Levelling of excavated materials at all agricultural properties (approximately 1,170 m <sup>3</sup> of material).	\$2,350.00
	c) Trucking of excavated materials to adjacent agricultural lands, at all residential properties, grassed lawns and unopened road allowance (Sta. 1+444 to Sta. 1+554), totalling approximately 60 m <sup>3</sup> of material.	\$1,000.00




<b>10<sup>th</sup> CONCESSION DRAIN</b>		
<b>Item</b>	<b>Description</b>	<b>Amount</b>
3.	Seeding of 1.0 m wide grass buffer strip beyond the top of bank on the south side of the drain from Station 0+774 to Station 1+440 (with the exception of the residential lawns) and on the east side of the drain from Station 1+450 to Station 3+537 (approximately 2,750 m <sup>2</sup> ).	\$5,500.00
4.	Supply and install rip-rap for surface water inlets as shown on typical drawing (approximately 15 m <sup>2</sup> each) in locations determined on-site by the Drainage Superintendent (approximately 11 locations in total). a) Sta. 0+850 (small drain – from south) b) Sta. 1+120 (small drain – from south) c) Sta. 1+558 (small drain – from west) d) Sta. 1+754 (small drain – from west) e) Sta. 1+882 (small drain – from west) f) Sta. 2+029 (small drain – from west) g) Sta. 2+180 (small drain – from west) h) Sta. 2+320 (small drain – from west) i) Sta. 2+623 (small drain – from west) j) Sta. 2+680 (surface runoff – west side) k) Sta. 3+413 (surface runoff – west side)	\$10,000.00
5.	Temporary silt control measures during construction at Station 0+776.	\$650.00
6.	Traffic Control, Plans and Signage in accordance with the current version of the Ontario Traffic Manual and the Occupational Health and Safety Act.	\$1,500.00



10 <sup>th</sup> CONCESSION DRAIN		
Item	Description	Amount
7.	<p><u>Bridge No. 1</u> – Station 1+450 (Unopened Road Allowance) Supply and installation of a new 23 m long, 1780 mm x 1360 mm aluminized corrugated steel pipe arch (CSPA) with clear stone bedding under pipe up to pipe spring line, filter fabric overlay (approximately 65 tonnes), Granular 'B' backfill up to underside of Granular 'A' at driveway (approximately 60 tonnes). Beyond driveway surface, clean native or imported clean backfill material from springline of pipe to the top of existing ground (approximately 40 m<sup>3</sup>). Restoration of granular driveway surface with compacted Granular 'A' (crushed limestone), minimum 200 mm thickness (approximately 20 tonnes). Restoration of all grassed areas including placement of 100 mm thick imported screened topsoil layer and seeding (approximately 35 m<sup>2</sup>). Sloping stone end walls (approximately 30 m<sup>2</sup>).</p>	\$16,750.00
8.	<p><u>Bridge No. 3</u> – Station 1+222 (Roll No. 520-03500) Remove and dispose of existing 1200 mm diameter, 5.5 m long pipe culvert including end walls off site. Supply and installation of a new 15.0 m long, 1600 mm diameter aluminized corrugated steel pipe (CSP) with clear stone bedding with filter fabric overlay (approximately 20 tonnes), full Granular 'B' backfill up to underside of Granular 'A' driveway surface material (approximately 110 tonnes). Beyond driveway surface, clean native or imported clean backfill material (approximately 20 m<sup>2</sup>). Restoration of granular driveway surface with compacted Granular 'A' (crushed limestone), minimum 200 mm thickness (approximately 25 tonnes). Restoration of all grassed areas including placement of 100 mm thick imported screened topsoil layer and seeding (approximately 35 m<sup>2</sup>). Sloping stone end walls (approximately 45 m<sup>2</sup>).</p>	\$14,450.00
	<b>PART B - SUB-TOTAL – EXCLUDING SECTION 26 COSTS</b>	<b>\$96,100.00</b>





<b>10<sup>th</sup> CONCESSION DRAIN</b>		
<b>Item</b>	<b>Description</b>	<b>Amount</b>
9.	Allowances for Part B only - under Sections 29 and 30	\$13,935.00
10.	Survey, Report, Assessment, Periodic Inspection and Final Inspection for Part B (cost portion)	\$24,500.00
11.	Expenses and Incidentals	<u>\$750.00</u>
	<b>PART B - TOTAL – EXCLUDING SECTION 26 COSTS</b>	<b>\$135,285.00</b>
	<b>SECTION 26 NON PRO-RATABLE COSTS</b>	
12.	Abandon existing 200 mm diameter CSP (Sta. 0+849) under Baseline Road. Fill with concrete grout.	\$800.00
13.	Remove and replace existing 11 m long, 450 mm diameter CSP (Sta. 0+780) under Baseline Road with a new 11 m long, 450 mm diameter HDPE pipe, clear stone bedding (approximately 5 tonnes), full Granular 'A' backfill under road and shoulders (approximately 45 tonnes), native backfill beyond road (approximately 10 m <sup>3</sup> ), HL3 asphalt surface (min. 120 mm thickness) (approximately 8 tonnes) and rip-rap end protection (approximately 15 m <sup>2</sup> ).	\$6,500.00
14.	Supply and install rip-rap on north drain bank at Station 1+431 (approximately 40 m <sup>2</sup> )	\$2,500.00
15.	Supply and install rip-rap on north drain bank at Station 0+850 including concrete block toe support (4 blocks 600x600x1200mm) (approximately 15 m <sup>2</sup> )	<u>\$1,500.00</u>
	<b>PART B - SUB-TOTAL – SECTION 26 NON PRO-RATABLE COSTS</b>	<b>\$11,300.00</b>
16.	Survey, Report, Assessment & Final Inspection (cost portion) Section 26 - Part B	\$2,800.00
17.	Expenses & Incidental (cost portion) Section 26 - Part B	<u>\$100.00</u>
	<b>PART B - TOTAL – SECTION 26 NON PRO-RATABLE COSTS</b>	<b>\$14,200.00</b>
	<b>PART B TOTAL ESTIMATE</b>	<b>\$149,485.00</b>
	<b>OVERALL TOTAL ESTIMATE - 10<sup>TH</sup> CONCESSION DRAIN</b>	<b>\$390,720.00</b>

The estimate provided in this report was prepared according to current materials and installation prices as of the date of this report. In the event of delays from the time of filing of the report by the Engineer to the time of tendering the work, it is understood that the estimate of cost is subject to inflation. The rate of inflation shall be calculated using the Consumer Price Index applied to the cost of construction from the date of the report to the date of tendering.

### **Assessment of Costs**

The individual assessments are comprised of three (3) assessment components:

- i. Benefit (*advantages relating to the betterment of lands, roads, buildings, or other structures resulting from the improvement to the drain*).
- ii. Outlet Liability (*part of cost required to provide outlet for lands and roads*).
- iii. Special Benefit (*additional work or feature that may not affect function of the drain*).


We have assessed the estimated costs for the 10<sup>th</sup> Concession Drain against the affected lands and roads as listed in Schedule 'C' under "Value of Special Benefit," "Value of Benefit" and "Value of Outlet." Details of the Value of Special Benefit listed in Schedule 'C' are provided in Schedule 'D.'

### **Assessment Rationale**

**Part A:** As the works are largely related to providing a higher level of public safety to Baseline Road, as well as increase the opportunity to improve and maintain Baseline Road, a large portion of the project costs will be assessed against the Town of Tecumseh Road Authority as owner of Baseline Road. In general terms, the majority of the costs would be assessed as a "Special Benefit" assessment against the Town of Tecumseh as the increase in cost for relocating the 10<sup>th</sup> Concession Drain away from the travelled portion of the road.

Special Benefit assessments shown in Schedule 'C' and detailed in Schedule 'D' were derived as follows:

1. The estimated increase in cost of the drainage works relating to the relocation of the open drain off of the road property from Station 0+010 to Station 0+756 including additional costs involved with earthworks, replacement of tile outlet pipes, additional seeding, rip-rap, rock check dam, refuge stilling pool and land allowances is assessed 100% as a Special Benefit against the Town of Tecumseh as owner of Baseline Road. Drainage improvements will also be carried out when the drain is relocated off of the road property. The portion of the project costs relating to the drainage improvements will be assessed as "Benefit" and "Outlet" assessments against the lands and roads in the 10<sup>th</sup> Concession Drain watershed. This portion of the earthworks cost would be assessed against the watershed in general as the new drain would be slightly deeper and wider than the existing drain, therefore property owners would be assessed only for the equivalent cost of a clean out of the existing drain. Brushing costs and some damage allowances would be included in the costs assessed against the watershed for drainage improvements. The cost items related to the drain relocation shall be assessed on a prorated basis.

- 
2. Stone erosion protection for private surface swale inlet repairs and bank erosion protection is assessed 100% against the Town of Tecumseh as owner of Baseline Road, as part of the Special Benefit for the drain relocation.

**Part B:** For the section of drain being cleaned out, we have assessed the above estimated cost for the repair and improvements to this portion of the drain against the affected lands and roads listed in Schedule 'C' under "Special Benefit", "Benefit" and "Outlet Liability."

1. The above estimated costs have been assessed 50% as a Benefit assessment and 50% as an Outlet Liability assessment against the upstream lands and roads within the drainage area.
2. For main tile outlet repairs and stone erosion protection required at the location of the main tile outlets, the Drainage Superintendent and/or Engineer may direct the contractor to make these repairs at the expense of the landowner. Private tile repairs shall be assessed 100% against the property on which the said tile exists.
3. Stone erosion protection for private surface swale inlet repairs and bank erosion protection is assessed 100% against the adjacent landowner, as part of the Special Benefit for the drain relocation.
4. Bridge No. 1 is a drain realignment bridge crossing property Roll No. 520-03400 that requires installation to improve the flow of the drain from the south. We have assessed 30% of the cost against the residential property as a Special Benefit and 70% being assessed as Outlet Liability against the upstream lands.
5. Bridge No. 3 is an access bridge for property Roll No. 520-03800 that requires replacement. We have assessed 50% of the cost against the adjoining property as a Special Benefit and 50% being assessed as Outlet Liability against the upstream lands and road.
6. Private tile cutoff header tile and tile inlet end replacement and repairs associated with the drain relocation are assessed 100% against the Town of Tecumseh as owner of Baseline Road, as part of the Special Benefit for the drain relocation.

#### **Special Benefit Assessments (Section 26)**

The Special Benefit assessments to the Road Authority, as noted above, shall be assessed as non-proratable assessments and are in accordance with Section 26 of the Drainage Act. These assessments shall be based on the actual construction costs plus engineering cost apportionment for the preparation of this report including contract administration and inspection costs and should be kept separate when tendering out the entire drainage works. The Town of Tecumseh may elect to tender the drain relocation portion of the project (Part A) separate from the remainder of the drainage works upstream (Part B) to coincide with the proposed bridge and road works along Baseline Road. All other remaining Special Benefit, Benefit and Outlet assessments shall be assessed as proratable assessments.

A Special Benefit assessment has been made to Hydro One as owners of the hydro poles on private property south of the south bank of the existing open drain. In Part A, a portion of the land taken allowance under Section 29 has been assessed to Hydro One for the additional land required on the adjacent private property for the drain move off due to the proximity and location of the hydro poles. The new north top of bank from Station 0+000A to Station 0+723A will be located 1.5 meters south of the existing hydro poles on private property.

Should the Road Authority elect to undertake the drainage works across their road right-of-way (Baseline Road) with their own forces, as per Section 69 of the Drainage Act, the Road Authority shall remain responsible for their allotment of costs for the preparation of this report as outlined in Schedule 'D.' The allocated report costs for the work is as follows:

- Baseline Road (Increased cost of drain move off) to be assessed \$62,500.00 including contract administration and full time inspection for the drain relocation
- Baseline Road (abandon/filling existing 200 mm diameter CSP) to be assessed \$200.00
- Baseline Road (Replace existing 450mm diameter CSP with 11 m long, 450 mm diameter HDPE) to be assessed \$1,650.00
- Repair rip-rap on north drain bank at station 1+431 to be assessed \$650.00
- Supply and install rip-rap on north drain bank at Station 0+850 including concrete block toe support be assessed \$400.00

### **Utilities**

In addition to the work provided for in the above estimate, it may be necessary to either temporarily or permanently adjust the location of existing utilities, so that they will be clear of the proposed drainage works and permit the work to be carried out. In accordance with Section 26 of the Drainage Act, we assess any relocation cost against the public utility having jurisdiction. Under Section 69 of the Drainage Act, the public utility is at liberty to do the work, but if it should not exercise its option within a reasonable length of time, the municipality may arrange to have this work completed and the cost will be charged to the appropriate public utility.

There is an existing overhead hydro line running parallel to the south edge of the existing drain from Sullivan Creek to County Road 43 and 2.0 m therefrom. Great care will be required around this hydro line while excavating the newly relocated drain and moving the excavated material to the existing drain.

### **Associate Drainage Superintendent (Town of Tecumseh)**

The City of Windsor is responsible for seeing that all of the work provided for in this report is satisfactorily completed. The City of Windsor must let a contract for the work from Station 0+000 to the head of the drain at Station 3+537. The Drainage Superintendent for the City of Windsor can administer the contract and oversee, in general, that all of the work set out in this report is carried out, but has no authority to act, or rights of property access, within the Town of Tecumseh. The Drainage Superintendent appointed for the Town of Tecumseh shall act as an Associate

Drainage Superintendent and supervise and inspect the work carried out by the Contractor within the Town of Tecumseh.

### **Future Maintenance (Open Drain)**

We recommend that future work of repair and maintenance on the 10<sup>th</sup> Concession Drain be carried out by each municipality for the part of the drain in their respective boundaries and the costs assessed against the affected lands and roads in the 10<sup>th</sup> Concession Drain watershed in accordance with the attached Schedules of Assessment labelled "Schedule E-1", "Schedule E-2" and "Schedule E-3." The Schedules of Assessment have been developed on the basis of an estimated cost.

The actual cost of maintenance works will be assessed against the lands and roads in the same relative proportions as shown herein, subject of course, to any variations that may be made under the authority of the Drainage Act. "Schedule E-1" is an assessment schedule for any future works of repair or maintenance on any of the bridge structures on the 10<sup>th</sup> Concession Drain only. All bridges are located within the Town of Tecumseh. "Schedule E-2" is an assessment schedule for any future works of repair or maintenance on the open portion of the 10<sup>th</sup> Concession Drain within the City of Windsor (Station 1+431 to Station 3+537). "Schedule E-3" is an assessment schedule for any future works of repair or maintenance on the open portion of the 10<sup>th</sup> Concession Drain within the Town of Tecumseh (Station 0+000 to Station 3+537).

Emergency maintenance works have been carried out by the Town of Tecumseh following the appointment of Dillon Consulting Limited to examine the 10<sup>th</sup> Concession Drain and provide a report under Section 78. The emergency maintenance works were performed in the existing open drain along the south side of Baseline Road and amounted to approximately \$7,850.00. This amount will be assessed out to the affected landowners in accordance with the future maintenance "Schedule E-2" and "Schedule E-3" in this report.

In addition, we also recommend that the costs of future works of repair and maintenance of the drain be as described below:

1. Tile inlet repairs and private tile cut-off headers installed under this report: 100% against the property on which the tile inlet or cut-off header is located.
2. Stone Erosion Protection: 100% against the property on which the tile or surface water inlet is located.
3. Trucking of excavated materials: 100% against the property on which the excavated material originated.
4. Other work: 100% against the lands listed in Schedule 'E-2' or Schedule 'E-3', depending on the location of the works, in the same relative proportions as the amounts listed under "Value of Benefit" and "Value of Outlet."



### **Future Maintenance (Private Access Bridges)**

We recommend that future work of repair and maintenance of the private access bridges within the 10<sup>th</sup> Concession Drain be carried out by the Municipality as shown in Schedule 'E-1'. Part of the maintenance cost of each bridge will be assessed as a Special Benefit assessment against the property or properties served by the bridge. The remainder of the maintenance cost will be assessed as Outlet assessment only to the lands and roads upstream of each bridge prorated to the assessments shown in Schedule 'E-1.'

Schedule 'E-1' represents all the lands and roads upstream of Bridge No. 3. The assessment is based on an arbitrary \$10,000.00 of future drain maintenance costs.

The division between Special Benefit and Outlet assessment for each bridge shall be as follows:

1. Bridge No. 1 - We have assessed 30% of the cost against the adjoining property (Roll No. 520-03400) as a Special Benefit and 70% being assessed as Outlet Liability against the upstream lands.
2. Bridge No. 2 - Will be abandoned and will no longer be part of the 10<sup>th</sup> Concession Drain. The bridge and the existing drain will serve as a roadside ditch for the Town of Tecumseh in the future. Therefore, we recommend 100% of the costs of repair and/or maintenance be assessed against the Town of Tecumseh Road Authority.
3. Bridge No. 3 - We have assessed 50% of the respective costs to the bridge owner listed under "Value of Special Benefit" and 50% to upstream lands and road on an affected area basis in the same relative proportions listed under "Value of Outlet."

### **Drawings and Specifications**

Attached to this report is "Schedule F," which contains specifications setting out the details of the recommended works, and "Schedule G," which represents the following drawings that are also attached to this report:

<b>Page 1 of 8:</b>	<b>Overall Plan</b>
<b>Page 2 of 8:</b>	<b>Profile 1</b>
<b>Page 3 of 8:</b>	<b>Profile 2</b>
<b>Page 4 of 8:</b>	<b>Drain Realignment Detail</b>
<b>Page 5 of 8:</b>	<b>Drain Realignment Section</b>
<b>Page 6 of 8:</b>	<b>Drain Relocation Details</b>
<b>Page 7 of 8:</b>	<b>Bridge Details</b>
<b>Page 8 of 8:</b>	<b>Miscellaneous Details</b>

### **Fisheries Issues**

The 10<sup>th</sup> Concession Drain has been classified by the Department of Fisheries and Oceans (DFO) as a Type F drain. Type F drains have intermittent water flow and may provide habitat for bait fish. Standard practices shall be followed to minimize disruption.



At the time of construction or maintenance, the Drainage Superintendent shall contact the governing Conservation Authority (acting liaison for DFO) or equivalent regulatory agency to confirm any construction limitations including timing windows or limitations related to in-stream work etc. as required.

All disturbed areas should be stabilized immediately. Upon completion of the work, or as soon as conditions allow, all disturbed areas shall be returned to a pre-disturbed state or better.

### **Grants**

In accordance with the provisions of Sections 85, 86 and 87 of the Drainage Act, a grant in the amount of 33-1/3 percent of the assessment eligible for a grant may be made in respect to the assessment made under this report upon privately owned lands used for agricultural purposes. This amount is not reflected in the attached assessment schedules. The assessments levied against privately owned agricultural land must also satisfy all other eligibility criteria set out in the Agricultural Drainage Infrastructure Program policies. Most of the privately owned lands are used for agricultural purposes and are eligible under the A.D.I.P. policies.

We recommend that application be made to the Ontario Ministry of Agriculture and Food in accordance with Section 88 of the Drainage Act, for this grant, as well as for all other grants for which this work may be eligible.

Respectfully submitted,

**DILLON CONSULTING LIMITED**

Christopher D. Thibert, P.Eng.

CDT:prc:wlb:ges



**“SCHEDULE A-1”**

**RECORD OF ENGINEERING ON-SITE MEETING  
10<sup>TH</sup> CONCESSION DRAIN  
CITY OF WINDSOR & TOWN OF TECUMSEH**

**Thursday, February 20, 2014**

In Attendance

**Landowners:** Connie Campeau, Murray MacKenzie, Cliff Campeau, Brenda Gagnon, Joe Gagnon, Norm Jobin

**Engineer:** Chris Thibert, P. Eng., Dillon Consulting Limited

**Municipal Staff:** Sam Paglia, Drainage Superintendent Town of Tecumseh and Paul Mourad, Engineer II City of Windsor

Introductions of Municipal Staff and Drainage Engineer were made and it was explained that this meeting was to address a request received from Joe Gagnon in the City of Windsor to investigate flooding and water back-up concerns for his property and the condition of the drain at the location where the drain turns from north/south to east/west along Baseline Road. It was identified that the last time any works of repair, improvement or maintenance was completed for this drain was from the previous engineers report dated 12 September, 1983. It was also discussed that this previous engineers report was very outdated and no longer valid due to changes in land uses/properties and municipal boundaries. Therefore, the entire drain would be examined with an updated assessment schedule for both the Town of Tecumseh and the City of Windsor to do maintenance and assess back costs effectively.

Chris Thibert outlined the process of submitting a report under Section 78 of the Drainage Act and explained that the next steps were to survey the entire drain to have a better understanding of the drain functionality and problem areas. Chris explained that there were flooding concerns from landowners occurring at a point where the drain turns from north/south to east/west forming a 90 degree bend in the drain. He explained that having a bend in the drain adjacent to the road could be a cause for future erosion and could negatively impact the road. Chris explained that the existing two structures on the drain, one at the 90 degree bend in the drain and one further downstream, were at the very least undersized and require further investigation. The bend in the drain followed immediately by an undersized culvert are possibly the main causes for the flooding. Chris concluded that the main focus of the survey will be to concentrate on this area to sufficiently address these concerns.

The landowners expressed concerns that the main area of flooding is always at the 90 degree bend in the drain affecting the properties immediately upstream. The landowners would like to see a more gradual transition in the drain at this location from north/south to east/west. Landowners also expressed concerns that the flooding and increase in water quantity in the drain did not start occurring until the expansions and improvements to Highway 401 were completed near the top end of the drain. Currently Highway 401 is not included in the watershed for the 10<sup>th</sup> Concession Drain and Chris ensured that the upstream end of drain, including Highway 401, would be properly surveyed along with obtaining design drawings for the highway and highway ditches. Chris explained that if the highway was draining into the 10<sup>th</sup> Concession Drain that any increase in costs caused by the highway would go back to the highway/MTO.

Landowners questioned working corridors, leveling of materials and allowances. Chris explained that the previous engineers report identified a side for leveling of materials and land/damage allowances would be properly granted to the affected landowners in accordance with Section 29 and 30 of the Drainage Act. Chris, Paul and Sam also explained the process of assessment for both the City of Windsor and Town of Tecumseh and that the City of Windsor is governed by the Windsor Act and all assessments to Windsor properties would go onto taxes.

On-site meeting questionnaires were sent out along with the meeting invite to all property owners. Two questionnaires were received, one from Joe Gagnon expressing his concerns for the flooding along his property and asking when any works can be performed to avoid any future problems. Chris explained that any maintenance works in advance of the report would be held until the report is submitted and assessed back to the drain in accordance with the new assessment schedules. The other questionnaire was from Cliff Campeau which identified his location on the drain.

Chris concluded the meeting explaining that in accordance with the instructions from the City of Windsor and Town of Tecumseh, a preliminary "draft report" meeting would be held with all affected landowners within the 10<sup>th</sup> Concession Drain watershed to go over the report and explain in detail the design and costs prior to submitting to council.

*Minutes recorded by Chris Thibert*

## **“SCHEDULE A-2”**

### **RECORD OF SECOND ENGINEERING ON-SITE MEETING 10<sup>TH</sup> CONCESSION DRAIN CITY OF WINDSOR & TOWN OF TECUMSEH**

**Thursday, May 15, 2014**

#### In Attendance

**Landowners:** Gerald Lavin, Helene Battersby, Sue MacKenzie-Russel, Brenda Gagnon, Joe Gagnon, Laurie Knight, Leo Labbee, Herbert Henricks, Murray MacKenzie, Cliff Campeau

**Engineer:** Chris Thibert, P. Eng., Dillon Consulting Limited

**Municipal Staff:** Sam Paglia, Drainage Superintendent Town of Tecumseh, Paul Mourad, Engineer II City of Windsor, Anna Godo, Drainage Superintendent City of Windsor and Jennifer Scherer, Assistant Drainage Superintendent City of Windsor

Introductions of Municipal Staff and Drainage Engineer were made and it was explained that this second meeting was to discuss findings of the engineer's survey and additional works required for the 10<sup>th</sup> Concession Drain. It was noticed that a lot of landowners present at this meeting were not present at the last meeting so Chris Thibert went over the process of submitting a report under Section 78 of the Drainage Act again to everyone.

Chris explained that during the survey and examination of the drain, it was determined that none of the Highway 401 water/ditches outlet into the 10<sup>th</sup> Concession Drain for the upstream end of the drain is too shallow to accept any drainage from the highway. The existing highway ditches lead right to Sullivan Creek which is just east of the 10<sup>th</sup> Concession Drain. Chris also explained, with the aid of pictures and survey data, that the existing condition of Baseline Road from Sullivan Creek to County Road 43 was in very poor condition with the south edge of asphalt eroding into the drain in some locations causing the road to be very unsafe and unstable. The existing drain has insufficient bottom width and side slopes to perform any works of improvement or maintenance safely without causing further damage to the road. It was therefore recommended that the drain be relocated further south onto private property with recommendations for the works under this report. Chris explained to the landowners the process of relocating the drain and allowances under Section 29 of the Drainage Act for land taken. Chris also explained that the increase in costs for this relocation would be at the Town of Tecumseh's expense less what a typical drain cleanout would cost which is assessed to the upstream lands and roads.

Chris also provided a preliminary design concept to eliminate the 90 degree bend in the drain where the flooding is occurring and replace with a new adequately sized angled pipe to allow for an improved transition from north/south to east/west as identified at the previous on-site meeting. The landowners present agreed to the design option and expressed their concerns and opinions with the design which Chris took down to make the necessary adjustments.

On-site meeting questionnaires were again sent out along with the meeting invite for this second meeting to all property owners. Only one questionnaire was received from Murray MacKenzie expressing concerns of flooding on his property as well. Chris explained that the improvements being recommended to the drain under his report would address his concerns as well.

Chris concluded the meeting explaining that in accordance with the instructions from the City of Windsor and Town of Tecumseh, a preliminary “draft report” meeting would still be held with all affected landowners within the 10<sup>th</sup> Concession Drain watershed to go over the report and explain in detail the design and costs prior to submitting to council.

*Minutes recorded by Chris Thibert*

**"SCHEDULE B"**  
**SCHEDULE OF ALLOWANCES**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

Roll No.	Con.	Description	Owner	Section 30 Damages	Section 29 Land	Total Allowances
<b>Part A</b>						
510-02100	11	Pt. Lot 16	Helene A. Battersby	\$2,545.00	\$19,690.00	\$22,235.00
<b>Part B</b>						
520-03900	10	Pt. Lot 16	Leonard Mackenzie & Connie Campeau	\$1,032.00	\$682.00	\$1,714.00
520-03500	10	Pt. Lot 16	Leonard Mackenzie & Connie Campeau	\$1,429.00	\$945.00	\$2,374.00
520-04000	10	Pt. Lot 15	Susanna Mackenzie	\$500.00	\$330.00	\$830.00
520-04100	10	Pt. Lot 15	Sanward Enterprises Inc.	\$510.00	\$335.00	\$845.00
520-04200	10	Pt. Lot 15	Edward J. Chittle	\$1,016.00	\$670.00	\$1,686.00
520-04400	10	Pt. Lot 14	Norman P. Jobin	\$1,998.00	\$1,320.00	\$3,318.00
520-04500	10	Pt. Lot 13	Sandwich South Farms Ltd.	\$1,910.00	\$1,258.00	\$3,168.00
<b>TOTAL ALLOWANCES .....</b>				<b>\$10,940.00</b>	<b>\$25,230.00</b>	<b>\$36,170.00</b>



**"SCHEDULE C"**  
**SCHEDULE OF ASSESSMENT**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

**CITY OF WINDSOR**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	1.00	0.40	City of Windsor	\$0.00	\$295.00	\$915.00	\$1,210.00
Total on Municipal Lands.....				\$0.00	\$295.00	\$915.00	\$1,210.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

PRIVATELY-OWNED - NON-AGRICULTURAL LANDS.									
Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-030-06300	10	Pt. Lot 16	1.06	0.43	Robert R. Coupe & Judy-Ann Loeffen-Coupe	\$0.00	\$104.00	\$381.00	\$485.00
090-030-06400	Plan 1351	Lots 45 & 46	0.34	0.14	Thomas G. & Marie S. Crouchman	\$0.00	\$52.00	\$191.00	\$243.00
090-030-06500	Plan 1351	Lots 47, 86 - 88	0.59	0.24	Gregory Maxwell	\$0.00	\$83.00	\$306.00	\$389.00
090-030-06600	Plan 1351	Lots 4 - 41, 48 - 85, 89 -173	22.06	8.93	Joseph A. & Brenda A. Gagnon	\$2,270.00	\$2,293.00	\$4,200.00	\$8,763.00
090-030-06700	10	Pt. Lot 16	0.37	0.15	Rousian Rakhoutine & Lilia	\$0.00	\$235.00	\$204.00	\$439.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$2,270.00	\$2,767.00	\$5,282.00	\$10,319.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

PRIVATELY-OWNED - AGRICULTURAL LANDS			Area Affected			Special		Total	
Roll No.	Con.	Description	(Acres)	(Ha.)	Owner	Benefit	Benefit	Outlet	Assessment
090-030-06100	10	Pt. Lot 15	27.50	11.13	Raymond J. & Elaine J. Simard	\$2,270.00	\$2,643.00	\$5,364.00	\$10,277.00
090-030-06000	10	Pt. Lot 15	15.50	6.27	1741077 Ontario Inc.	\$1,138.00	\$1,432.00	\$3,074.00	\$5,644.00
090-030-05850	10	Pt. Lot 15	14.50	5.87	1433310 Ontario Ltd.	\$1,138.00	\$1,387.00	\$2,917.00	\$5,442.00
090-030-05600	10	Pt. Lot 14	29.00	11.74	Gerald F. & Agnes D. Lavin	\$1,138.00	\$2,847.00	\$5,990.00	\$9,975.00
090-030-05400	10	Pt. Lot 14	38.00	15.38	Norbert L. St. Louis	\$1,138.00	\$3,302.00	\$8,077.00	\$12,517.00
090-030-05200	10	Pt. Lot 13	19.00	7.69	John R. Wilson	\$0.00	\$1,667.00	\$4,090.00	\$5,757.00
090-030-05000	10	Pt. Lot 13	40.00	16.19	Norman P. & Rose M. Jobin	\$0.00	\$3,379.00	\$8,852.00	\$12,231.00
090-030-04800	10	Pt. Lots 12 & 13	18.60	7.53	882885 Ontario Limited	\$1,138.00	\$1,608.00	\$4,167.00	\$6,913.00
090-030-04700	10	Pt. Lot 12	5.40	2.19	Sandwich South Farms Ltd.	\$0.00	\$271.00	\$1,211.00	\$1,482.00
Total on Privately-Owned - Agricultural Lands.....						\$7,960.00	\$18,536.00	\$43,742.00	\$70,238.00

<b>TOTAL ASSESSMENT (CITY OF WINDSOR) .....</b>					<b>\$10,230.00</b>	<b>\$21,598.00</b>	<b>\$49,939.00</b>	<b>\$81,767.00</b>
		(Acres)	(Ha.)					
<b>Total Area:</b>		<b>232.92</b>	<b>94.28</b>					

**TOWN OF TECUMSEH**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	4.00	1.62	Town of Tecumseh	\$0.00	\$7,653.00	\$2,138.00	\$9,791.00
Unopened Road Allowance	0.45	0.18	Town of Tecumseh	\$500.00	\$691.00	\$245.00	\$1,436.00
County Road No. 43 (11th Con. Rd)	4.20	1.70	County of Essex	\$0.00	\$1,144.00	\$1,751.00	\$2,895.00
Total on Municipal Lands.....				\$500.00	\$9,488.00	\$4,134.00	\$14,122.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

PRIVATELY OWNED - NON-AGRICULTURAL LANDS									
Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-04250	10	Pt. Lot 15 RP12R14826 Pt. 1	1.24	0.50	Edward T. & Melodie A. Valeur	\$0.00	\$110.00	\$183.00	\$293.00
520-03800	10	Pt. Lot 16 PLAN 1351 Lot 266 & 267	0.23	0.09	Daniel B. & Nancy K. Ewing	\$9,400.00	\$148.00	\$72.00	\$9,620.00
520-03400	10	Pt. Lot 16 PLAN 1351 Lot 184 & 185	0.22	0.09	Joseph & Helen Diesbourg	\$6,300.00	\$148.00	\$125.00	\$6,573.00
520-03901	10	Pt. Lot 16 RP12R5728 Pt. 1	1.00	0.40	Clifford L. & Connie L. Campeau	\$500.00	\$409.00	\$165.00	\$1,074.00
520-03920	10	Pt. Lot 15 RP12R9554 Pt. 1 RP12R14250 Pt. 1	0.67	0.27	Herbert Henricks	\$0.00	\$89.00	\$147.00	\$236.00
510-02010	11	Pt. Lot 16 RP12R4919 Pt. 1	1.01	0.41	Laurie L. Knight	\$0.00	\$101.00	\$169.00	\$270.00
510-02005	11	Pt. Lot 15 RP12R12199 Pt. 1	0.50	0.20	Ruth Battersby	\$0.00	\$79.00	\$223.00	\$302.00
560-03920	10	Pt. Lot 17	0.75	0.30	David J. & Gayle S. Clarke	\$0.00	\$93.00	\$154.00	\$247.00
560-00300	10	S. Pt. Lot 17	2.50	1.01	St. Clair Baptist Church	\$0.00	\$141.00	\$234.00	\$375.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$16,200.00	\$1,318.00	\$1,472.00	\$18,990.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

Roll No.	Con.	Description	Area Affected		Owner	Special	Benefit	Outlet	Total
			(Acres)	(Ha.)		Benefit			Assessment
520-04500	10	Pt. Lot 13	20.00	8.09	* Sandwich South Farms Ltd.	\$0.00	\$1,459.00	\$1,340.00	\$2,799.00
520-04400	10	Pt. Lots 14	20.00	8.09	* Norman P. Jobin	\$0.00	\$1,459.00	\$1,340.00	\$2,799.00
520-04000	10	Pt. Lot 15	24.33	9.85	Susanna MacKenzie	\$0.00	\$1,907.00	\$3,413.00	\$5,320.00
520-04100	10	Pt. Lot 15	24.50	9.91	Sanward Enterprises Inc.	\$0.00	\$1,272.00	\$2,041.00	\$3,313.00
520-04200	10	Pt. Lot 15	28.76	11.64	Edward J. Chittle	\$0.00	\$1,532.00	\$2,397.00	\$3,929.00
520-03500	10	Pt. Lot 16	21.00	8.50	Leonard Mackenzie & Connie Campeau	\$0.00	\$3,606.00	\$3,003.00	\$6,609.00
520-03900	10	Pt. Lot 16	27.20	11.01	Leonard Mackenzie & Connie Campeau	\$2,270.00	\$2,782.00	\$2,432.00	\$7,484.00
510-02100	11	Pt. Lot 16	59.00	23.88	Helene Ann Battersby	\$0.00	\$6,302.00	\$4,918.00	\$11,220.00
560-03900	10	Pt. Lot 17	7.00	2.83	Susanna MacKenzie	\$0.00	\$350.00	\$583.00	\$933.00
Total on Privately-Owned - Agricultural Lands.....						\$2,270.00	\$20,669.00	\$21,467.00	\$44,406.00

**SECTION 26 INCREASED COSTS - NON PRO-RATABLE**

				Special Benefit	Benefit	Outlet	Total Assessment
Roll No.	Con.	Description	Owner				
Baseline Road			Town of Tecumseh	\$225,935.00	\$0.00	\$0.00	\$225,935.00
	11	Pt. Lot 16	Hydro One	\$5,500.00	\$0.00	\$0.00	\$5,500.00
Total Section 26 Increased Costs (Non Pro-ratable).....				\$231,435.00	\$0.00	\$0.00	\$231,435.00
TOTAL ASSESSMENT (TOWN OF TECUMSEH) .....				\$250,405.00	\$31,475.00	\$27,073.00	\$308,953.00
		(Acres)	(Ha.)				
Total Area:		248.56	100.57				
* Denotes Cut-Off Benefit Only							
OVERALL TOTAL ASSESSMENT .....				\$260,635.00	\$53,073.00	\$77,012.00	\$390,720.00

**"SCHEDULE D"**  
**DETAILS OF SPECIAL BENEFIT**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

**SPECIAL BENEFIT ASSESSMENT**  
**(GENERAL DESCRIPTION OF SPECIAL BENEFIT)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
520-03400	Joseph & Helen Diesbourg	<u>Bridge No. 1</u> - Station 1+465 - Supply and install a new 23.0 m long, 1780x1360 mm CSPA culvert complete with sloping stone end walls. (30%)	\$5,000.00	\$1,300.00	\$6,300.00
Unopened Road Allowance	Town of Tecumseh	Portion of trucking cost for excavated material at unopened road allowance (100%)	\$400.00	\$100.00	\$500.00
520-03800	Daniel B. & Nancy E. Ewing	<u>Bridge No. 3</u> - Station 1+222 - Remove existing 1200mm diameter culvert and supply and install new 15.0m long, 1600mm diameter CSP culvert complete with sloping stone endwalls (50%)	\$7,250.00	\$1,900.00	\$9,150.00
		Portion of trucking cost for excavated material at residential properties (100%)	\$200.00	\$50.00	\$250.00
Total for Property Roll No. 520-03800 =			\$7,450.00	\$1,950.00	\$9,400.00
520-03900	Leonard Mackenzie & Connie Campeau	Station 0+850 and Station 1+120 - Installation of rip-rap for private surface swale inlet (100%)	\$1,820.00	\$450.00	\$2,270.00
520-03901	Clifford L. & Connie L. Campeau	Portion of trucking cost for excavated material at residential properties (100%)	\$400.00	\$100.00	\$500.00
090-030-06600	Joseph A. & Brenda A. Gagnon	Station 1+558 and Station 1+754 - Installation of rip-rap for private surface swale inlet (100%)	\$1,820.00	\$450.00	\$2,270.00
090-030-06100	Raymond J. & Elaine J. Simard	Station 1+882 and Station 2+029 - Installation of rip-rap for private surface swale inlet (100%)	\$1,820.00	\$450.00	\$2,270.00
090-030-06000	1741077 Ontario Inc.	Station 2+180 - Installation of rip-rap for private surface swale inlet (100%)	\$908.00	\$230.00	\$1,138.00
090-030-05850	1433310 Ontario Ltd.	Station 2+320 - Installation of rip-rap for private surface swale inlet (100%)	\$908.00	\$230.00	\$1,138.00
090-030-05600	Gerald F. & Agnes D. Lavin	Station 2+623 - Installation of rip-rap for private surface swale inlet (100%)	\$908.00	\$230.00	\$1,138.00
090-030-05400	Norbert L. St. Louis	Station 2+680 - Installation of rip-rap for private surface swale inlet (100%)	\$908.00	\$230.00	\$1,138.00
090-030-04800	882885 Ontario Limited	Station 3+413 - Installation of rip-rap for private surface swale inlet (100%)	\$908.00	\$230.00	\$1,138.00
<b>Total Special Benefit Assessment (Excl. Non Pro-Ratable Costs).....</b>			<b>\$23,250.00</b>	<b>\$5,950.00</b>	<b>\$29,200.00</b>

**SPECIAL BENEFIT ASSESSMENT**  
**(SECTION 26 - NON PRO-RATABLE COSTS)**

Roll No.	Owner	Item Description	Estimated Cost	Cost of Report	Special Benefit
	Hydro One	Portion of land taken allowance under Section 29 for additional land required on adjacent private property for drain move off from Station 0+000A to Station 0+748A due to location and proximity of hydro poles.	\$5,500.00	\$0.00	\$5,500.00
Baseline Road	Town of Tecumseh	Increased cost of drain move off from Station 0+000A to Station 0+748A including allowances under Section 29 & 30.	\$149,235.00	\$62,500.00	\$211,735.00
		Abandon existing 200 mm diameter CSP (Sta. 0+849) under Baseline Road. Fill with concrete grout. (100%)	\$800.00	\$200.00	\$1,000.00
		Remove and replace existing 11 m long, 450 mm diameter CSP (Sta. 0+780) under Baseline Road with a new 11 m long, 450 mm diameter HDPE pipe. (100%)	\$6,500.00	\$1,650.00	\$8,150.00
		Supply and install rip-rap on north drain bank at Station 1+431. (100%)	\$2,500.00	\$650.00	\$3,150.00
		Supply and install rip-rap on north drain bank at Station 0+850 including concrete block toe support. (100%)	\$1,500.00	\$400.00	\$1,900.00
Total for Town of Tecumseh =			\$160,535.00	\$65,400.00	\$225,935.00
Total Special Benefit Assessment (Non Pro-Ratable Costs).....			\$166,035.00	\$65,400.00	\$231,435.00
OVERALL TOTAL SPECIAL BENEFIT ASSESSMENT .....					\$260,635.00

**"SCHEDULE E-1"**  
**SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (BRIDGES ONLY)**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

**CITY OF WINDSOR**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	1.00	0.40	City of Windsor	\$0.00	\$0.00	\$176.00	\$176.00
Total on Municipal Lands.....				\$0.00	\$0.00	\$176.00	\$176.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-030-06300	10	Pt. Lot 16	1.06	0.43	Robert R. Coupe & Judy-Ann Loeffen-Coupe	\$0.00	\$0.00	\$73.00	\$73.00
090-030-06400	Plan 1351	Lots 45 & 46	0.34	0.14	Thomas G. & Marie S. Crouchman	\$0.00	\$0.00	\$37.00	\$37.00
090-030-06500	Plan 1351	Lots 47, 86 - 88	0.59	0.24	Gregory Maxwell	\$0.00	\$0.00	\$59.00	\$59.00
090-030-06600	Plan 1351	Lots 4 - 41, 48 - 85, 89 - 173	22.06	8.93	Joseph A. & Brenda A. Gagnon	\$0.00	\$0.00	\$785.00	\$785.00
090-030-06700	10	Pt. Lot 16	0.37	0.15	Rousian Rakhoutine & Lilia	\$0.00	\$0.00	\$40.00	\$40.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$0.00	\$0.00	\$994.00	\$994.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-030-06100	10	Pt. Lot 15	27.50	11.13	Raymond J. & Elaine J. Simard	\$0.00	\$0.00	\$978.00	\$978.00
090-030-06000	10	Pt. Lot 15	15.50	6.27	1741077 Ontario Inc.	\$0.00	\$0.00	\$551.00	\$551.00
090-030-05850	10	Pt. Lot 15	14.50	5.87	1433310 Ontario Ltd.	\$0.00	\$0.00	\$516.00	\$516.00
090-030-05600	10	Pt. Lot 14	29.00	11.74	Gerald F. & Agnes D. Lavin	\$0.00	\$0.00	\$1,032.00	\$1,032.00
090-030-05400	10	Pt. Lot 14	38.00	15.38	Norbert L. St. Louis	\$0.00	\$0.00	\$1,352.00	\$1,352.00
090-030-05200	10	Pt. Lot 13	19.00	7.69	John R. Wilson	\$0.00	\$0.00	\$676.00	\$676.00
090-030-05000	10	Pt. Lot 13	40.00	16.19	Norman P. & Rose M. Jobin	\$0.00	\$0.00	\$1,423.00	\$1,423.00
090-030-04800	10	Pt. Lots 12 & 13	18.60	7.53	882885 Ontario Limited	\$0.00	\$0.00	\$662.00	\$662.00
090-030-04700	10	Pt. Lot 12	5.40	2.19	Sandwich South Farms Ltd.	\$0.00	\$0.00	\$193.00	\$193.00
Total on Privately-Owned - Agricultural Lands.....						\$0.00	\$0.00	\$7,383.00	\$7,383.00

<b>TOTAL ASSESSMENT (CITY OF WINDSOR) .....</b>						<b>\$0.00</b>	<b>\$0.00</b>	<b>\$8,553.00</b>	<b>\$8,553.00</b>
			(Acres)	(Ha.)					
<b>Total Area:</b>			<b>232.92</b>	<b>94.28</b>					



**TOWN OF TECUMSEH**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	4.00	1.62	Town of Tecumseh	\$0.00	\$0.00	\$264.00	\$264.00
Unopened Road Allowance	0.45	0.18	Town of Tecumseh	\$0.00	\$0.00	\$47.00	\$47.00
Total on Municipal Lands.....				\$0.00	\$0.00	\$311.00	\$311.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-03800	10	Pt. Lot 16 PLAN 1351 Lot 266 & 267	0.23	0.09	Daniel B. & Nancy K. Ewing	\$0.00	\$0.00	\$13.00	\$13.00
520-03400	10	Pt. Lot 16 PLAN 1351 Lot 184 & 185	0.22	0.09	Joseph & Helen Diesbourg	\$0.00	\$0.00	\$24.00	\$24.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$0.00	\$0.00	\$37.00	\$37.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-04000	10	Pt. Lot 15	24.33	9.85	Susanna MacKenzie	\$0.00	\$0.00	\$440.00	\$440.00
520-03500	10	Pt. Lot 16	21.00	8.50	Leonard Mackenzie & Connie Campeau	\$0.00	\$0.00	\$659.00	\$659.00
Total on Privately-Owned - Agricultural Lands.....						\$0.00	\$0.00	\$1,099.00	\$1,099.00

<b>TOTAL ASSESSMENT (TOWN OF TECUMSEH)</b> .....						<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1,447.00</b>	<b>\$1,447.00</b>
			(Acres)	(Ha.)					
<b>Total Area:</b>			<b>50.23</b>	<b>20.33</b>					
<b>OVERALL TOTAL ASSESSMENT</b> .....						<b>\$0.00</b>	<b>\$0.00</b>	<b>\$10,000.00</b>	<b>\$10,000.00</b>

**"SCHEDULE E-2"**  
**SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (DRAIN ONLY)**  
**WITHIN CITY OF WINDSOR FROM STATION 1+431 TO STATION 3+537**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	1.00	0.40	City of Windsor	\$0.00	\$64.00	\$83.00	\$147.00
<b>Total on Municipal Lands</b>				<b>\$0.00</b>	<b>\$64.00</b>	<b>\$83.00</b>	<b>\$147.00</b>

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-030-06300	10	Pt. Lot 16	1.06	0.43	Robert R. Coupe & Judy-Ann Loeffen-Coupe	\$0.00	\$22.00	\$35.00	\$57.00
090-030-06400	Plan 1351	Lots 45 & 46	0.34	0.14	Thomas G. & Marie S. Crouchman	\$0.00	\$11.00	\$17.00	\$28.00
090-030-06500	Plan 1351	Lots 47, 86 - 88	0.59	0.24	Gregory Maxwell	\$0.00	\$17.00	\$28.00	\$45.00
090-030-06600	Plan 1351	Lots 4 - 41, 48 - 85, 89 - 173	22.06	8.93	Joseph A. & Brenda A. Gagnon	\$0.00	\$540.00	\$390.00	\$930.00
090-030-06700	10	Pt. Lot 16	0.37	0.15	Rousian Rakhoutine & Lilla	\$0.00	\$58.00	\$19.00	\$77.00
<b>Total on Privately-Owned - Non-Agricultural Lands</b>						<b>\$0.00</b>	<b>\$648.00</b>	<b>\$489.00</b>	<b>\$1,137.00</b>

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
090-030-06100	10	Pt. Lot 15	27.50	11.13	Raymond J. & Elaine J. Simard	\$0.00	\$617.00	\$511.00	\$1,128.00
090-030-06000	10	Pt. Lot 15	15.50	6.27	1741077 Ontario Inc.	\$0.00	\$333.00	\$297.00	\$630.00
090-030-05850	10	Pt. Lot 15	14.50	5.87	1433310 Ontario Ltd.	\$0.00	\$324.00	\$285.00	\$609.00
090-030-05600	10	Pt. Lot 14	29.00	11.74	Gerald F. & Agnes D. Lavin	\$0.00	\$666.00	\$597.00	\$1,263.00
090-030-05400	10	Pt. Lot 14	38.00	15.38	Norbert L. St. Louis	\$0.00	\$761.00	\$623.00	\$1,584.00
090-030-05200	10	Pt. Lot 13	19.00	7.69	John R. Wilson	\$0.00	\$385.00	\$420.00	\$805.00
090-030-05000	10	Pt. Lot 13	40.00	16.19	Norman P. & Rose M. Jobin	\$0.00	\$776.00	\$927.00	\$1,703.00
090-030-04800	10	Pt. Lots 12 & 13	18.60	7.53	882885 Ontario Limited	\$0.00	\$370.00	\$440.00	\$810.00
090-030-04700	10	Pt. Lot 12	5.40	2.19	Sandwich South Farms Ltd.	\$0.00	\$56.00	\$128.00	\$184.00
<b>Total on Privately-Owned - Agricultural Lands</b>						<b>\$0.00</b>	<b>\$4,288.00</b>	<b>\$4,428.00</b>	<b>\$8,716.00</b>

**TOTAL ASSESSMENT (CITY OF WINDSOR)** ..... **\$0.00**    **\$5,000.00**    **\$5,000.00**    **\$10,000.00**

	(Acres)	(Ha.)
<b>Total Area:</b>	<b>232.92</b>	<b>94.28</b>

**"SCHEDULE E-3"**  
**SCHEDULE OF ASSESSMENT FOR FUTURE MAINTENANCE (DRAIN ONLY)**  
**WITHIN TOWN OF TECUMSEH FROM STATION 0+000 TO STATION 3+537**  
**10TH CONCESSION DRAIN**  
**TOWN OF TECUMSEH & CITY OF WINDSOR**

**MUNICIPAL LANDS:**

Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
Baseline Road	4.00	1.62	Town of Tecumseh	\$0.00	\$1,154.00	\$388.00	\$1,542.00
Unopened Road Allowance	0.45	0.18	Town of Tecumseh	\$0.00	\$103.00	\$26.00	\$129.00
County Road No. 43 (11th Con. Rd)	4.20	1.70	County of Essex	\$0.00	\$195.00	\$355.00	\$550.00
Total on Municipal Lands.....				\$0.00	\$1,452.00	\$769.00	\$2,221.00

**PRIVATELY-OWNED - NON-AGRICULTURAL LANDS:**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-04250	10	Pt. Lot 15 RP12R14826 Pt. 1	1.24	0.50	Edward T. & Melodie A. Valeur	\$0.00	\$19.00	\$37.00	\$56.00
520-03800	10	Pt. Lot 16 PLAN 1351 Lot 266 & 267	0.23	0.09	Daniel B. & Nancy K. Ewing	\$0.00	\$23.00	\$12.00	\$35.00
520-03400	10	Pt. Lot 16 PLAN 1351 Lot 184 & 185	0.22	0.09	Joseph & Helen Diesbourg	\$0.00	\$23.00	\$13.00	\$36.00
520-03901	10	Pt. Lot 16 RP12R5728 Pt. 1	1.00	0.40	Clifford L. & Connie L. Campeau	\$0.00	\$63.00	\$33.00	\$96.00
520-03920	10	Pt. Lot 15 RP12R9554 Pt. 1 RP12R14250 Pt. 1	0.67	0.27	Herbert Henricks	\$0.00	\$15.00	\$30.00	\$45.00
510-02010	11	Pt. Lot 16 RP12R4919 Pt. 1	1.01	0.41	Laurie L. Knight	\$0.00	\$17.00	\$34.00	\$51.00
510-02005	11	Pt. Lot 15 RP12R12199 Pt. 1	0.50	0.20	Ruth Battersby	\$0.00	\$13.00	\$45.00	\$58.00
560-03920	10	Pt. Lot 17	0.75	0.30	David J. & Gayle S. Clarke	\$0.00	\$16.00	\$31.00	\$47.00
560-00300	10	S. Pt. Lot 17	2.50	1.01	St. Clair Baptist Church	\$0.00	\$24.00	\$47.00	\$71.00
Total on Privately-Owned - Non-Agricultural Lands.....						\$0.00	\$213.00	\$282.00	\$495.00

**PRIVATELY-OWNED - AGRICULTURAL LANDS**

Roll No.	Con.	Description	Area Affected (Acres) (Ha.)		Owner	Special Benefit	Benefit	Outlet	Total Assessment
520-04500	10	Pt. Lot 13	20.00	8.09 *	Sandwich South Farms Ltd.	\$0.00	\$240.00	\$272.00	\$512.00
520-04400	10	Pt. Lots 14	20.00	8.09 *	Norman P. Jobin	\$0.00	\$240.00	\$272.00	\$512.00
520-04000	10	Pt. Lot 15	24.33	9.85	Susanna MacKenzie	\$0.00	\$311.00	\$468.00	\$779.00
520-04100	10	Pt. Lot 15	24.50	9.91	Sanward Enterprises Inc.	\$0.00	\$218.00	\$414.00	\$632.00
520-04200	10	Pt. Lot 15	28.76	11.64	Edward J. Chittle	\$0.00	\$262.00	\$486.00	\$748.00
520-03500	10	Pt. Lot 16	21.00	8.50	Leonard Mackenzie & Connie Campeau	\$0.00	\$558.00	\$429.00	\$987.00
520-03900	10	Pt. Lot 16	27.20	11.01	Leonard Mackenzie & Connie Campeau	\$0.00	\$444.00	\$493.00	\$937.00
510-02100	11	Pt. Lot 16	59.00	23.88	Helene Ann Battersby	\$0.00	\$1,002.00	\$997.00	\$1,999.00
560-03900	10	Pt. Lot 17	7.00	2.83	Susanna MacKenzie	\$0.00	\$60.00	\$118.00	\$178.00

Total on Privately-Owned - Agricultural Lands..... \$0.00 \$3,335.00 \$3,949.00 \$7,284.00

**TOTAL ASSESSMENT (TOWN OF TECUMSEH) .....** **\$0.00 \$5,000.00 \$5,000.00 \$10,000.00**

(Acres) (Ha.)

**Total Area: 248.56 100.57**  
 \* Denotes Cut-Off Benefit Only

SCHEDULE 'F'  
RELOCATION, REPAIR AND IMPROVEMENT OF THE  
**10<sup>TH</sup> CONCESSION DRAIN**  
IN THE CITY OF WINDSOR & TOWN OF TECUMSEH

**SPECIAL PROVISIONS**

**1.0 GENERAL SPECIFICATIONS**

The General Specifications attached hereto is part of "Schedule F." It also forms part of this specification and is to be read with it, but where there is a difference between the requirements of the General Specifications and those of the Special Provisions which follow, refer to the sections in the Special Provisions.

**2.0 DESCRIPTION OF WORK**

The work to be carried out under this Contract includes, but is not limited to, the supply of all **labour and materials** to complete the following items:

**PART A - DRAIN RELOCATION (Sta. 0+000 to Sta. 0+764)**

- Tree and brush removal as follows:
  - Station 0+000 to Station 0+764 including the disposal by burning on-site or removal off-site. Clearing shall include the removal of all growth between the south edge of gravel of Baseline Road to 15 metres south of the property limit (very light brushing).
- Strip and replace topsoil as follows:
  - From Station 0+000A to Station 0+748A strip topsoil over proposed open channel limits and stockpile. Load, haul and place stockpiled topsoil over fill materials on existing drain alignment from Station 0+000 to Station 0+756 upon completion of excavation and levelling (approximately 6,100 m<sup>2</sup>).
- Excavation, hauling, filling and compaction of excavated materials, as follows:
  - Excavation of new channel on private property from Station 0+000A to Station 0+748A with 2 to 1 side slopes and 1 metre bottom width (approximately 7,050 m<sup>3</sup>).
  - Remove all vegetation, organic debris and topsoil from the existing drain slopes. Fill existing drain channel from Station 0+000 to Station 0+756 including hauling, filling and compaction of material in 250 mm lifts. Compaction to a minimum of 95% standard proctor density. Any excess materials to be hauled away off-site.
- Tile outlet repairs from Station 0+000A to Station 0+748A, as follows:

**Tile outlet drains from the south shall be extended using 320 kPa smooth wall high density polyethylene pipe (HDPE). New outlet pipes shall be a minimum 3 metre length of non-perforated pipe complete with rodent grate as follows:**

  - Replace all existing 100 mm diameter tile ends with 150 mm diameter HDPE pipe. Approximately 3 locations totalling 9 m of 150 mm diameter HDPE pipe.
  - Replace all existing 150 mm diameter tile ends with 200 mm HDPE pipe. Approximately 1 location totalling 3 m of 200 mm diameter HDPE pipe.
  - Replace all existing 300 mm diameter tile ends with 375 mm HDPE pipe. Approximately 2 locations totalling 6 m of 375 mm diameter HDPE pipe.

- Replace all existing 375 mm diameter tile ends with 450 mm diameter HDPE pipe. Approximately 1 location totalling 3 m of 350 mm diameter HDPE pipe.
- Replace all existing 400 mm diameter tile ends with 450 mm diameter HDPE pipe. Approximately 2 locations totalling 6 m of 450 mm diameter HDPE pipe.
- Seeding of drain banks, grass buffer strips and area over old drain, as follows:
  - Supply and placement of bonded fibre matrix hydro-seed on new drain banks from Station 0+000A to Station 0+748A (approximately 5,900 m<sup>2</sup>).
  - Establish 1.0 m wide grass buffer strip beyond the top of bank on the south side of the drain from Station 0+020A to Station 0+748A (approximately 723 m<sup>2</sup>).
  - Lands between the south edge of gravel of Baseline Road and the north top of bank of the new channel (i.e. over the existing drain from Station 0+000 to Station 0+756 plus the land between the new and existing drain) shall be drill-seeded as per specifications (approximately 7,000 m<sup>2</sup>).
- Rock Flow Check Dam (temporary) (OPSD 219.211) – Station 0+012– Supply and install stone erosion protection (SEP) (approximately 30 m<sup>2</sup>) including new filter fabric underlay beneath a small rock dam constructed across the drain for silt and sediment control measures during construction.
- Supply and install stone erosion protection on drain bank Station 0+722A to Station 0+747A complete with filter fabric underlay (minimum 300 mm thickness) (approximately 75 m<sup>2</sup>).
- Supply and install stone erosion protection at outlet into Sullivan Creek complete with filter fabric underlay (minimum 300 mm thickness) (approximately 145 m<sup>2</sup>).
- Excavation of a 300 mm deep and 1.0 m wide bottom, refuge stilling pool in the new channel below the design gradeline from Station 0+040A to Station 0+050A (10 m). Also included is a 200 mm thick stone rip-rap lining complete with filter fabric underlay.
- Temporary silt control measures during construction at Station 0+020.

**PART B - DRAIN CLEAN OUT- from County Road 43 (Station 0+764) to upper end of drain (Station 3+537)**

- Tree and brush removal from Station 0+774 to Station 3+537 with trimming and/or removal of existing trees within the drain as required to accommodate the drainage works excluding ornamental trees where possible. The work shall include disposal of brush by means of stockpiling and burning where permitted or alternatively trucked off-site (medium brush removal).
- Excavation, trucking and/or levelling of excavated materials, as follows:
  - Excavation of drain bottom, as follows:
    - Station 0+774 to Station 3+537, totalling 2,763 m of drain and approximately 1,230 m<sup>3</sup> of material.
  - Levelling of excavated materials at all agricultural properties (approximately 1,170 m<sup>3</sup> of material).
  - Trucking of excavated materials to adjacent agricultural lands, at all residential properties, grassed lawns and unopened road allowance (Sta. 1+444 to Sta. 1+554), totalling approximately 60 m<sup>3</sup> of material.

- Seeding of 1.0 m wide grass buffer strip beyond the top of bank on the south side of the drain from Station 0+774 to Station 1+440 (with the exception of the residential lawns) and on the east side of the drain from Station 1+450 to Station 3+537 (approximately 2,750 m<sup>2</sup>).
- Install rip-rap surface water inlets as shown on typical drawing (approximately 15 m<sup>2</sup> each) in locations determined on-site by the Drainage Superintendent (approximately 11 locations in total).
  - Sta. 0+850 (small drain – from south)
  - Sta. 1+120 (small drain – from south)
  - Sta. 1+558 (small drain – from west)
  - Sta. 1+754 (small drain – from west)
  - Sta. 1+882 (small drain – from west)
  - Sta. 2+029 (small drain – from west)
  - Sta. 2+180 (small drain – from west)
  - Sta. 2+320 (small drain – from west)
  - Sta. 2+623 (small drain – from west)
  - Sta. 2+680 (surface runoff – west side)
  - Sta. 3+413 (surface runoff – west side)
- Temporary silt control measures during construction at Station 0+776.
- Traffic Control, Plans and Signage in accordance with the current version of the Ontario Traffic Manual and the Occupational Health and Safety Act.
- Bridge No. 1 – Station 1+450 (Roll No. 520-03400)-Supply and installation of a new 23 m long, 1780 mm x 1360 mm aluminized corrugated steel pipe arch (CSPA) with clear stone bedding under pipe up to pipe springline and filter fabric overlay (approximately 65 tonnes), Granular ‘B’ backfill up to underside of Granular ‘A’ at driveway (approximately 60 tonnes). Beyond driveway surface, clean native or imported clean backfill material from springline of pipe to the top of existing ground (approximately 40 m<sup>3</sup>). Restoration of granular driveway surface with compacted Granular ‘A’ (crushed limestone), minimum 200 mm thickness (approximately 20 tonnes). Restoration of all grassed areas including placement of 100 mm thick imported screened topsoil layer and seeding (approximately 35 m<sup>2</sup>). Sloping stone end walls (approximately 30 m<sup>2</sup>).
- Bridge No. 3 – Station 1+222 (Roll No. 520-03500) Remove and dispose of existing 1200 mm diameter, 5.5 m long pipe culvert including end walls off site. Supply and installation of a new 15.0 m long, 1600 mm diameter aluminized corrugated steel pipe (CSP) with clear stone bedding with filter fabric overlay (approximately 20 tonnes), full Granular ‘B’ backfill up to underside of Granular ‘A’ driveway surface material (approximately 110 tonnes). Beyond driveway surface, clean native or imported clean backfill material (approximately 20 m<sup>2</sup>). Restoration of granular driveway surface with compacted Granular ‘A’ (crushed limestone), minimum 200 mm thickness (approximately 25 tonnes). Restoration of all grassed areas including placement of 100 mm thick imported screened topsoil layer and seeding (approximately 35 m<sup>2</sup>). Sloping stone end walls (approximately 45 m<sup>2</sup>).

### 3.0 ACCESS TO THE WORK

Access to the 10<sup>th</sup> Concession Drain from Station 0+000 to Station 1+440 shall be from Baseline Road and County Road 43. Access to the 10<sup>th</sup> Concession Drain relocation (Station 0+000 to Station 0+764) shall be from an existing farm access culvert over the Battersby Drain just south of Baseline Road on the east side of County Road 43. Access to the 10<sup>th</sup> Concession Drain from Station 1+440 to 3+537 shall be across Bridge No. 2 and the unopened road allowance. The Contractor shall make his/her own arrangements for any additional access for his/her convenience. Any damages resulting from the Contractor’s access to the drain shall be rectified to pre-existing conditions at his/her expense.

#### 4.0 WORKING AREA

For all works between Station 0+000 and Station 0+764, the working area shall be the road allowance of Baseline Road to the south of the driving surface. On private lands south of the existing 10<sup>th</sup> Concession Drain, the working area shall include the area required to accommodate the proposed open channel, a 1 metre wide buffer strip on the south side of the new drain and a 9.0 m wide temporary working corridor south of the buffer strip will be provided for the temporary stockpiling of the topsoil stripped from the site and works on the drain. No excavated material will be left on this temporary working corridor. The width of the temporary topsoil stockpile corridor shall be 9.0 m wide.

The working area from Station 0+764 to Station 1+466 shall be the road allowance of Baseline Road to the south of the driving surface. On private lands south of the existing 10<sup>th</sup> Concession Drain, the working area shall include a 9.0 temporary working corridor south of the buffer strip.

The working area from Station 1+466 to Station 3+537 shall be on private lands east of the existing 10<sup>th</sup> Concession Drain and shall include a 9.0 temporary working corridor east of the buffer strip.

With the exception of the off-loading of equipment, trucking of excavated materials and construction materials, no other work shall commence from the driving surface of Baseline Road or County Road 43. The road must remain open at all times.

**Any damages to lands and/or roads from the Contractor's work within the working areas shall be rectified to pre-existing conditions at his/her expense.**

#### 5.0 DRAIN RELOCATION/OPEN CHANNEL WORKS

##### 5.1 Setting Out

Benchmarks are provided on the attached drawings (drawing 8 of 8). From these benchmarks, the contractor will do his own setting out. The setting out by the Contractor shall include but shall not be limited to the preparation of grade sheets, the installation of centreline stakes, grade stakes, offsets, and sight rails.

If, during the setting out, the contractor finds an error in the benchmarks provided by the Engineer in the attached drawings, or is uncertain as to the interpretation of the information provided or the work intended, he shall notify the Engineer immediately for additional verification or clarification before proceeding with construction.

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work.

If, at any time during the progress of the works, an error shall appear or arise in the position, levels, dimensions or alignment of any part of the works, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer.

##### 5.2 Profile and Excavation of New Drain

Excavation shall be carried out in accordance with the profile shown on the drawings for the drain relocation. In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. **The Contractor shall not excavate deeper than the gradelines shown on the drawings.**

Should over excavation of the drain bank occur, the Contractor will not be permitted to repair with native material packed into place by the excavator and re-shaped. Should over excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

The contractor shall complete the excavation of the new course of the drain from Station 0+000A to Station 0+748A. The subsoil is to be excavated from the new course, and placed directly in the existing drain as long as it is spread in uniform full width layers of not more than 250 mm depths to ensure proper compaction practices as described below.

All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing. Any damages to trees or vegetation caused by the Contractors work shall be rectified to the satisfaction of the Drainage Superintendent.

The Contractor shall exercise caution around existing tile inlets and shall confirm with the property owners that all tiles have been located and tile ends repaired as specified.

### **5.3 Alignment and Dimensions**

Alignment of the new open channel for the 10<sup>th</sup> Concession Drain from Station 0+000A to Station 0+723A shall be so that the north top of bank of the new open channel is 3.5 metres to the south of the south top of bank of the existing open channel.

The north and south banks shall be constructed at a slope of 1 vertical to 2 horizontal from the ground surface to the grade specified on the appropriate profile drawing. At the proper grade, a 1.0 metre wide drain bottom shall be constructed.

Layout of the working limits shall be determined by the area required to accommodate the specified dimensioning along with the specifications of the working corridor in Section 4.0 'Working Area.'

### **5.4 Obstructions**

All brush, timber, logs, stumps, stones or other obstructions that interfere with the construction of the drain, encountered along the course of the drain are to be removed by the Contractor. Timber, logs and stumps are to be dealt with in the same manner as specified for brush and trees. Large stones and other similar material are to be piled near the limit of the working corridor and the disposal of this material will be the responsibility of the landowner.

Where the new drain alignment encounters private open drains it may be necessary to remove pipes which have been installed as erosion protection in the mouth of the open private drain. These pipes are to be removed with reasonable care and deposited on the adjacent land at the edge of the working corridor. The landowner shall remain responsible to replace the pipe in the private drain or dispose of it as they prefer.

### **5.5 Topsoil Strip and Replace**

Topsoil shall be stripped for a minimum depth of 150 mm from the proposed open drain alignment including all trenches excavated across lawn areas. The topsoil shall be stockpiled south of the proposed open channel in a temporary 9.0 m wide corridor. Later, the topsoil will be spread on the existing abandoned drain alignment, the banks of the new drain and the disturbed lawn areas. A minimum depth of topsoil over the old course of the drain is 150 mm. A 50 mm layer of topsoil shall be placed and graded on the banks of the new drain. Disturbed lawn areas shall be top dressed with a minimum 100 mm of topsoil.

Excess topsoil shall not be removed from the site. Excess topsoil shall be used to repair settlements and increase the topsoil thickness over the filled alignment.

It is anticipated that the amount of topsoil stripped from proposed open channel alignments will be greater than the amount required to dress the entire surface of the filled alignment however, if needed, the Contractor shall import screened topsoil to complete the work at their expense.



### 5.6 Filling and Levelling of Existing Drain

Native soil materials removed from new alignment of the 10<sup>th</sup> Concession Drain shall be used to fill the existing open drain from Station 0+000 to Station 0+756. Excess excavated materials shall require trucking and hauling off-site and disposed of at the Contractor's expense. Prior to the infilling of the open drain, the contractor shall remove all vegetation, organic debris and topsoil from the existing drain slopes and haul off-site and dispose of at the Contractor's expense. The native materials used to fill the drain shall be placed in maximum 250 mm loose lifts, with the exception of within accesses and tile drain extensions as described herein, and compacted with sheepsfoot type compaction equipment capable of achieving 95% of the maximum standard proctor density or better. The contractor shall use benching when filling in the drain as per OPSD 208.010 with bench lifts not exceeding 0.6 metres. Fill shall be placed in the existing drain to the surface to match existing grade. **Furthermore, the contractor shall confirm with the Drainage Superintendent that all existing lateral and main tile outlets have been found and marked prior to infilling the drain.**

Each layer shall be compacted to a Standard Proctor Dry Density of 95% by repetitive passes over the fill area with standard levelling equipment or compaction equipment if necessary. Then, the excess excavated subsoil is to be placed and graded in the area of the existing drain and the areas where topsoil was stripped on both sides of the existing drain. These areas are to be levelled and graded to provide a uniform contour and slope.

Then, the stockpiled topsoil removed from this area is to be replaced and spread over the entire area. The grading and re-levelling of this area is to be carried out to the satisfaction of the Drainage Superintendent in charge. The finished work shall allow for drainage of surface runoff without ponding.

Alternative methods or procedures for completing the earthworks may be proposed by the Contractor for approval of the engineer prior to construction. All work must be acceptable to the Drainage Superintendent in charge.

It may be required to relocate excavated material on-site for use in other locations to reach the desired grade elevation and contours for the area where the existing drain is backfilled. On-site relocation shall be completed at the expense of the Contractor.

Materials in excess of that required to fill the drain shall be hauled off-site to an approved dumping location. Topsoil shall not be removed from the site but is to be used as the top layer of backfill for the abandoned open drain.

### 5.7 Outlet Pipes

Outlet drains shall be extended through the new south drain bank using 320 kPa smooth wall high density polyethylene pipe (HDPE). Each outlet pipe shall be a minimum 3 metre length of non-perforated pipe complete with rodent grate per Section 9.0 'Tile Outlet Repairs.'

## 6.0 STONE EROSION PROTECTION (SEP)

Erosion protection, as specified in the locations on the drawings, shall be constructed of quarry stone rip-rap consisting of 150 - 250 mm sized clear quarry angular limestone materials placed over a non-woven filter fabric Terrafix 270R or approved equivalent.

At locations where surface water run-off enters the drain, as determined on site by the Drainage Superintendent, the contractor shall install surface water inlets.

## **7.0 ROCK CHECK DAMS**

Rock check dams shall be installed at the downstream end of the proposed works prior to commencing construction. The location and exact dimensions of the rock check dams will be confirmed with the Drainage Superintendent prior to their installation. Installation shall be in accordance with OPSD 219.211 with the modifications to size as discussed with the Drainage Superintendent.

The rock check dams will not be removed until vegetation is established in the new channel or as directed by the Drainage Superintendent.

## **8.0 REFUGE STILLING POOL**

The Contractor shall construct a refuge stilling pool in the bottom of the new open drain from Station 0+040A to Station 0+050A. The contractor shall excavate the pool in the drain bottom to enhance fish habitat. The pool shall have a length of 10 metres, a bottom width of 1.0 metres with 1:1 side slopes and a depth below design grade of 300 mm. A stone rip-rap lining, countersunk and 200 mm thick with filter fabric underlay, shall be placed in the bottom. The pool shall be centred on the finished bottom width of the drain as specified herein. Material excavated from the pool shall be disposed of in the same manner as all other material excavated from the channel bottom.

## **9.0 TILE OUTLET REPAIRS**

For tile outlets along the south drain bank of the relocated drain, the Contractor shall excavate a sufficient distance into the south drain bank of the new open channel to accommodate the proposed inlet pipe replacements and/or relocations from the north side of the drain. New high density polyethylene (HDPE) pipes shall have a smooth interior wall, a minimum 320 kPa pipe stiffness and conform to ASTM D3350, CAN/CSA B182.6-M92 and OPSS 1840.

New plastic drainage tubing if required shall be black (UV resistant) corrugated, high density, polyethylene tubing, made with high density polyethylene resin, meeting or exceeding Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D1248 and shall have a minimum pipe stiffness of 170 kPa and 210 kPa at 5% deflection, when tested in accordance with ASTM D2412.

All connections to the existing tile shall be in a silt-tight manner, as approved by the Drainage Superintendent. When connecting two (2) pieces of plastic drainage tubing, the Contractor shall use factory manufactured snap, insert or split couplers that are silt-tight. The area of the bank disturbed by the repairs and/or relocation shall be backfilled with compacted native material and shaped to match the contour of the adjacent drain bank. The Contractor shall minimize disturbance of the very sensitive banks. As specified below, disturbed areas shall then be covered with filter fabric and 300 mm of graded rip-rap stone (125 - 250 mm clear quarried rock or OPSS 1001, with quantity of stone shown below). When cutting back the existing plastic drainage tubing exposes white tubing (non-UV resistant), the Contractor shall replace the last 3.0 m of drainage tubing, as specified above with black (UV resistant) tubing.

## **10.0 SEEDING OF FILLED OLD DRAIN ALIGNMENT**

Prior to seeding, all areas to be seeded shall be fine graded, and loosened to a minimum depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of.

Grass seed shall be Canada No. 1 residential lawn grass seed mixture, as follows:

Creeping Red Fescue	30%
Premium Kentucky Bluegrass	25%
Turf-Type Perennial Rye Grass	45%

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Seed shall be applied at a rate of 200 kg per 10,000 m<sup>2</sup>. Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m<sup>2</sup>. It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

Seeding shall be carried out immediately following the drain construction and shall be **drilled** into the topsoil layer. The Contractor shall note that seeding will not be deemed complete, until the seed has established and formed a protective mat over the soil (taken). Accordingly, the Contractor will be required to continue seeding until the Engineer and the Drainage Superintendent are satisfied with the area seeded under this item.

#### **11.0 HYDRAULIC SEEDING OF DRAIN BANKS ON NEW DRAIN CHANNEL & GRASS BUFFER STRIP ALONG NEW DRAIN CHANNEL**

The newly established drain banks and all existing grassed areas disturbed by construction shall be hydraulic mulch seeded as specified herein. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of.

Bonded Fibre Matrix shall consist of thermally refined wood fibers and 10% cross-linked hydro-colloidal tackifiers. It should be 100% biodegradable. The curing period shall be not more than 48 hours. Bonded Fibre Matrix shall be hydraulically applied and after application be capable of adhering to the soil. In a dry state, shall be comprised of not less than 70% by weight of long, stranded wood fibres held together by organic or mineral bonding agents or both.

Bonded Fibre Matrix shall be applied at a minimum rate of 3,700 kg of dry product per 10,000 m<sup>2</sup>. It shall be thoroughly mixed with water in a hydraulic seeder and mulcher at a rate of 20-30 kg of dry product to 500-600 litres of water to form a homogeneous slurry. Refer to OPSS.PROV 804 for specifications.

Seeding and mulching shall be a one step process in which the seed, fertilizer and hydraulic mulch are applied simultaneously in a water slurry via the hydraulic seeder/mulcher. The materials shall be added to the supply tank while it is being loaded with water. The materials shall be thoroughly mixed into a homogeneous water slurry and shall be distributed uniform, cohesive mat over the prepared surface. The materials shall be measured by mass or by a mass-calibrated volume measurement, acceptable to the Drainage Superintendent.

The hydraulic seeder/mulcher shall be equipped with mechanical agitation equipment capable of mixing the materials into a homogenous state until applied. The discharge pumps and gun nozzles shall be capable of applying the material uniformly.

Grass seed shall be Canada No. 1 grass seed mixture meeting the requirements of a Waterway Slough Mixture as supplied by Growmark or approved equal, as follows:

<i>Creeping Red Fescue</i>	20%
<i>Meadow Fescue</i>	30%
<i>Tall Fescue</i>	30%
<i>Timothy</i>	10%
<i>White Clover</i>	10%

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Seed shall be applied at a rate of 200 kg per 10,000 m<sup>2</sup>.

Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m<sup>2</sup>. It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

**The hydraulic seeding shall be deemed "Completed by the Contractor" when the seed has established in all areas to the satisfaction of the Engineer. Re-seeding and/or other methods required to establish the grass will be given consideration to achieve the end result and the costs shall be incidental to the works.**

## **PART B – DRAIN CLEAN OUT – Station 0+776 to Station 3+537**

### **12.0 BRUSHING**

Brushing shall be carried out on the entire drain within the above identified sections of the drain where required and as specified herein. All brush and trees located within the drain side slopes shall be cut parallel to the side slopes, as close to the ground as practicable. Tree branches that overhang the drain shall be trimmed. Small branches and limbs are to be disposed of by the Contractor along with the other brush. Tree stumps, where removed to facilitate the drain excavation and reshaping of the drain banks, may be burned by the Contractor where permitted; otherwise, they shall be disposed of, off the site. The Contractor shall make every effort to preserve mature trees which are beyond the drain side slopes, and the working corridors. If requested to do so by the Drainage Superintendent, the Contractor shall preserve certain mature trees within the designated working corridors (see Section 4.0).

Except as specified herein, all brush and trees shall be stockpiled adjacent to the drain within the working corridors. Stockpiles shall not be less than 100 m apart and shall be a minimum of 2.0 m from the edge of the drain bank. All brush, timber, logs, stumps, large stones or other obstructions and deleterious materials that interfere with the construction of the drain, as encountered along the course of the drain are to be removed from the drain by the Contractor. Large stones and other similar material shall be disposed of by the Contractor off the site.

Following completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which remain standing, disposing of the branches cut off along with other brush and leaving the trees in a neat and tidy condition. Brush and trees removed from the working area are to be put into piles by the Contractor, in locations where they can be safely burned, and to be burned by the Contractor after obtaining the necessary permits, as required. If, in the opinion of the Drainage Superintendent, any of the piles are too wet or green to be burned, he shall so advise the Contractor to haul away the unburned materials to an approved dump site. Prior to, and during the course of burning operations, the Contractor shall comply with the current guidelines prepared by the Air Quality Branch of the Ontario Ministry of Environment and shall ensure that the Environmental Protection Act is not violated. Since the trees and brush that are cut off flush with the earth surface may sprout new growth later, it is strongly recommended that the Municipality make arrangements for spraying this new growth at the appropriate time so as to kill the trees and brush.

As part of this work, the Contractor shall remove any loose timber, logs, stumps, large stones or other debris from the drain bottom and from the side slopes. Timber, logs, stumps, large stones or other debris shall be disposed of off-site.

### **13.0 EXCAVATION AND LEVELLING OF EXCAVATED MATERIALS**

#### **13.1 Excavation of Existing Drain Channel**

In all cases, the Contractor shall use the benchmarks to establish the proposed grade. However, for convenience, the drawings provide the approximate depth from the surface of the ground and from the existing drain bottom to the proposed grades. The Contractor shall not excavate deeper than the gradelines shown on the drawings. Should over-excavation of the drain bank occur, the Contractor will not be permitted to repair with native material packed into place by the excavator and reshaped. Should over-excavation occur, the Contractor will be required to have a bank repair detail engineered by a Professional Engineer (hired by the Contractor), to ensure long term stability of the bank is maintained. Such repairs shall be subject to approval by the Engineer and will be at no extra cost to the item.

All excavated material shall be handled as specified in Section 5.6. Materials deposited on the farmlands shall be within the working corridors, at least 1.0 m from the top of the drain bank, or as specified on the drawings. Upon allowing drying of excavated materials (if necessary) and as approved by the Drainage Superintendent, the Contractor shall level excavated materials in accordance with Section 5.6. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain.

Seeding of the disturbed drain banks shall be completed immediately following drain construction and as specified in Section 11.0.

All excavation work shall be done in such a manner as to not harm any vegetation or trees, not identified in this report or by the Drainage Superintendent for clearing. Any damages to trees or vegetation caused by the Contractors work shall be rectified to the satisfaction of the Drainage Superintendent.

Where there are existing grass buffer strips, the excavated material shall be deposited beyond (east of) the buffer strip. The excavator, if possible, should not occupy the grass buffer strip. If it is found absolutely necessary to occupy the grass buffer strip, the contractor shall repair any damage and reseed the damaged area.

The Contractor shall exercise caution around existing tile inlets and shall confirm with the property owners that all tiles have been located and tile ends repaired as specified.

It is possible that some tile ends will have to be repaired as well as some surface drain outlets and bank failures. These repairs are to be at the expense of the landowner. See Assessment Rationale-Open Drain Improvements section of the report which covers these repairs.

### **13.2 Cleaning Of Private Access Culverts**

The Contractor shall clean the existing pipes or culverts to their full capacity and cross section or width. The operation may be carried out by mechanical means or by flushing. Any damage resulting from the Contractor's operation shall be rectified at his expense. All material removed from the pipes or culverts shall be transported to a dump site arranged by the Contractor. The Contractor shall be solely responsible for acquiring all permits required for the dump site. The Contractor shall take precautions during the construction period to avoid re-sedimentation of the pipes and culverts. Any sediment deposited as a result of construction activities shall be removed at the Contractor's expense.

### **13.3 Levelling of Excavated Materials**

Excavation of the drain bottom shall be completed as specified in Section 13.1, above and also as specified below and as shown on the drawings.

Excavated drain materials shall be spread to a depth not to exceed 150 mm, unless specified otherwise on the drawings. The material shall be sufficiently levelled to allow further working by agricultural implements. All stones and other debris removed from the drain, which may interfere with agricultural implements, shall be disposed of off-site. Excavated material shall not be placed on dykes, in ditches, tiles or depressions intended to conduct water into the drain.

### **13.4 Trucking of Excavated Materials**

Excavated materials are the property of the Contractor and trucking of excavated materials to off-site disposal site to be arranged by Contractor for all residential properties.

The Contractor shall be solely responsible for acquiring any and all permits and approvals required prior to hauling and disposal of materials off-site. The Contractor shall restore any such areas which are damaged by his operations, to original or better condition. The Contractor will be held liable for damages to roads, sodded areas and gardens, resulting from his non-compliance with these Specifications.

#### **14.0 GRASS BUFFER STRIPS**

A 1.0 metre wide grass buffer shall be established and preserved immediately adjacent to the east bank of the open channel. Grass buffer strips are to be established as indicated in Section 2.0 'Description of Work'. Establishment of grass buffer strips shall be executed using the same seeding methods as described in Section 15.0 of the Special Provisions.

#### **15.0 SEEDING OF GRASS BUFFER STRIPS**

All existing grassed areas disturbed by construction or as identified as new or existing grass buffers shall be seeded as specified herein. The existing ground surface to be seeded shall be loosened to a depth of 25 mm and shall be rendered uniformly loose for that 25 mm depth. The surface shall be predominantly fine and free from weeds and other unwanted vegetation. All other loose surface litter shall be removed and disposed of. If mulching is required, it shall be carried out by the contractor as part of the item's tendered price.

Grass seed shall be Canada No. 1 grass seed mixture meeting the requirements of a Waterway Slough Mixture as supplied by Growmark or approved equal, as follows:

<i>Creeping Red Fescue</i>	20%
<i>Meadow Fescue</i>	30%
<i>Tall Fescue</i>	30%
<i>Timothy</i>	10%
<i>White Clover</i>	10%

Bags shall bear the label of the supplier indicating the content by species, grade and mass. Seed shall be applied at a rate of 200 kg per 10,000 m<sup>2</sup>.

Fertilizer shall be 8-32-16 applied at 350 kg per 10,000 m<sup>2</sup>. It shall be in granular form, dry, free from lumps and in bags bearing the label of the manufacturer, indicating mass and analysis.

The seeding shall be deemed "Completed by the Contractor" when the seed has established in all areas to the satisfaction of the Engineer. Re-seeding and/or other methods required to establish the grass will be given consideration to achieve the end result and the costs shall be incidental to the works.

#### **16.0 ABANDON EXISTING PIPE UNDER BASELINE ROAD**

The Contractor shall be required to prepare the existing pipe, where indicated on the drawings, to be abandoned.

This work shall include filling the existing 200 mm diameter corrugated steel pipe with a weak sand/cement grout, which has a minimum 28 day compressive strength of 0.40 MPa. The grout shall have a minimum slump of 150 mm at the point of discharge, and shall flow freely so that it is capable of filling all voids within the pipe. The Contractor shall implement whatever measure necessary to ensure all voids within the pipe are filled.

#### **17.0 ACCESS BRIDGE WORK**

##### **17.1 Location of New Bridge**

The bridge shall be located and installed as shown on the drawings.

##### **17.2 Removal of Existing Bridges**

All materials including existing piping and bridge end wall materials shall be removed from the existing drain alignments. The removed materials shall be hauled away to an approved dump site.

### 17.3 Materials for New Access Bridge

Materials should be as follows:

<i>Bridge Pipe</i>	<b><u>Bridge No. 1 – Station 1+450 (Unopened Road Allowance)</u></b> – New 23 m long, 1780 x 1380 mm aluminized corrugated steel pipe arch (CSPA) wall thickness of 2.8 mm and 125 mm x 25 mm corrugations. <b><u>Bridge No. 3 – Station 1+222 (Roll No. 520-03800)</u></b> – New 15.0 m long, 1600 mm diameter aluminized corrugated steel pipe (CSP) wall thickness of 2.8 mm and 125 mm x 25 mm corrugations.
<i>Pipe Bedding</i>	20-25 mm clear stone conforming to OPSS Division 10. Minimum 150 mm thickness.
<i>Backfill</i>	Granular 'B' conforming to OPSS Division 10.
<i>Backfill- Driveway</i>	Granular 'B' to underside of Granular 'A' driveway material conforming to OPSS Division 10.
<i>Backfill- Beyond Driveway Surface</i>	Dry native material free of topsoil, organic matter, broken concrete, steel, wood and deleterious substances. Alternatively, Granular 'A' or 'B' conforming to OPSS Division 10 at the contractor's expense.
<i>Driveway Surface</i>	Granular 'A' made from crushed limestone conforming to OPSS Division 10. Minimum 200 mm thickness.
<i>Filter Fabric</i>	"Non-Woven" geotextile filter fabric with a minimum strength equal to or greater than Terrafix 270R, Amoco 4546, Mirafi 140NC or approved equivalent.
<i>Sloping Stone End Walls</i>	All stone to be used for erosion protection shall be 125 - 250 mm clear quarried rock or OPSS.Muni 1001. Minimum 300 mm thickness.

### 17.4 Lateral Tile Drains

Should the Contractor encounter any lateral tiles within the proposed bridge limits, the Contractor shall re-route the outlet tile drain(s) in consultation with the Drainage Superintendent, as required, to accommodate the new bridge. **Tile drain outlets through the wall of the new bridge pipe will not be permitted.** All costs associated with re-routing lateral tile drains (if any) shall be at the Contractor's expense.

### 17.5 Access Bridge Installation

Bridge No. 1 shall be set to the invert elevations shown on Drawing 4 of 8. This provides for the 10% embedment of the invert below the design grade. Suitable dykes shall be constructed in the drain so that the installation can be accomplished in the dry. The drain bottom shall be cleaned, prepared, shaped and compacted to suit the bridge construction, as shown on the drawings. Granular materials shall be compacted to 98% of their maximum dry density. The Contractor shall exercise caution not to damage existing utility services that may cross the drain in the vicinity of the bridges. The Contractor shall arrange for field locates of all utilities to be completed prior to excavation. Any damage caused to any utility by the Contractor's actions shall be repaired to the satisfaction of the utility, at the Contractor's expense.



### **17.6 Sloping Stone End Walls**

Sloping stone end walls shall be constructed of quarry stone rip-rap, as shown on the drawings and as specified herein. Each end wall shall extend from the invert of the new bridge to the top of the proposed lane. The end walls shall be sloped 1 vertical to 1.5 horizontal, with a filter fabric underlay surrounding the pipe and spanning across the entire width of the drain. The minimum thickness requirement of the erosion stone layer is 300 mm, with no portion of the filter fabric to be exposed.

### **17.7 Native Materials (Beyond Road Limits)**

Native materials suitable for use as backfill beyond the limits of the road surface and shoulders, as defined under Section 12.2, shall be salvaged from the existing bridge sites as required to complete the work as shown on the drawings and/or from the drain widening between Station 0+061 to Station 1+046. Any surplus native materials (if any) not required in the bridge installation shall be disposed of in the working corridor between Station 0+061 and Station 1+046.

### **17.8 Site Cleanup and Restoration**

As part of the work and upon completion, the Contractor shall remove and dispose of, off-site any loose timber, logs, stumps, large stones, rubber tires, cinder blocks or other debris from the drain bottom and from the side slopes. Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

## **GENERAL SPECIFICATIONS**

### **1.0 AGREEMENT AND GENERAL CONDITIONS**

The part of the Specifications headed "Special Provisions" which is attached hereto forms part of this Specification and is to be read with it. Where there is any difference between the requirements of this General Specification and those of the Special Provisions, the Special Provisions shall govern.

Where the word "Drainage Superintendent" is used in this specification, it shall mean the person or persons appointed by the Council of the Municipality having jurisdiction to superintend the work.

Tenders will be received and contracts awarded only in the form of a lump sum contract for the completion of the whole work or of specified sections thereof. The Tenderer agrees to enter into a formal contract with the Municipality upon acceptance of the tender. The General Conditions of the contract and Form of Agreement shall be those of the Stipulated Price Contract CCDC2-Engineers, 1994 or the most recent revision of this document.

### **2.0 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS**

Each tenderer must visit the site and review the plans and specifications before submitting his/her tender and must satisfy himself/herself as to the extent of the work and local conditions to be met during the construction. Claims made at any time after submission of his/her tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions, will not be allowed. The Contractor will be at liberty, before bidding to examine any data in the possession of the Municipality or of the Engineer.

The quantities shown or indicated on the drawings or in the report are estimates only and are for the sole purpose of indicating to the tenderers the general magnitude of the work. The tenderer is responsible for checking the quantities for accuracy prior to submitting his/her tender.

### **3.0 MAINTENANCE PERIOD**

The successful Tenderer shall guarantee the work for a period of one (1) year from the date of acceptance thereof from deficiencies that, in the opinion of the Engineer, were caused by faulty workmanship or materials. The successful Tenderer shall, at his/her own expense, make good and repair deficiencies and every part thereof, all to the satisfaction of the Engineer. Should the successful Tenderer for any cause, fail to do so, then the Municipality may do so and employ such other person or persons as the Engineer may deem proper to make such repairs or do such work, and the whole costs, charges and expense so incurred may be deducted from any amount due to the Tenderer or may be collected otherwise by the Municipality from the Tenderer.

### **4.0 GENERAL CO-ORDINATION**

The Contractor shall be responsible for the coordination between the working forces of other organizations and utility companies in connection with this work. The Contractor shall have no cause of action against the Municipality or the Engineer for delays based on the allegation that the site of the work was not made available to him by the Municipality or the Engineer by reason of the acts, omissions, misfeasance or non-feasance of other organizations or utility companies engaged in other work.

### **5.0 RESPONSIBILITY FOR DAMAGES TO UTILITIES**

The Contractor shall note that overhead and underground utilities such as hydro, gas, telephone and water are not necessarily shown on the drawings. It is the Contractor's responsibility to contact utility companies for information regarding utilities, to exercise the necessary care in construction operations and to take other precautions to safeguard the utilities from damage. All work on or adjacent to any utility, pipeline, railway, etc., is to be carried out in accordance with the requirements of the utility, pipeline, railway, or other, as the case may be, and its specifications for such work are to be followed as if they were part of this specification. The Contractor will be liable for any damage to utilities.

## **6.0 CONTRACTOR'S LIABILITY**

The Contractor, his/her agents and all workmen or persons under his/her control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever, occasioned in the carrying on of the work, or by any neglect on the Contractor's part.

The Contractor, shall indemnify and hold harmless the Municipality and the Engineer, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the contract.

## **7.0 PROPERTY BARS AND SURVEY MONUMENTS**

The Contractor shall be responsible for marking and protecting all property bars and survey monuments during construction. All missing, disturbed or damaged property bars and survey monuments shall be replaced at the Contractor's expense, by an Ontario Land Surveyor.

## **8.0 MAINTENANCE OF FLOW**

The Contractor shall, at his/her own cost and expense, permanently provide for and maintain the flow of all drains, ditches and water courses that may be encountered during the progress of the work.

## **9.0 ONTARIO PROVINCIAL STANDARDS**

Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) shall apply and govern at all times unless otherwise amended or extended in these Specifications or on the Drawing. Access to the electronic version of the Ontario Provincial Standards is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>. Under the title Technical Manuals is a link to the Ontario Provincial Standards. Users require Adobe Acrobat to view all pdf files.

## **10.0 APPROVALS, PERMITS AND NOTICES**

The construction of the works and all operations connected therewith are subject to the approval, inspection, by-laws and regulations of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced in this Contract. The Contractor shall obtain all approvals and permits and notify the affected authorities when carrying out work in the vicinity of any public utility, power, underground cables, railways, etc.

## **11.0 SUBLETTING**

The Contractor shall keep the work under his/her personal control, and shall not assign, transfer, or sublet any portion without first obtaining the written consent of the Municipality.

## **12.0 TIME OF COMPLETION**

The Contractor shall complete all work on or before the date fixed at the time of tendering. The Contractor will be held liable for any damages or expenses occasioned by his/her failure to complete the work on time and for any expenses of inspection, superintending, re-tendering or re-surveying, due to their neglect or failure to carry out the work in a timely manner.

## **13.0 TRAFFIC CONTROL**

The Contractor will be required to control vehicular and pedestrian traffic along roads at all times and shall, at his/her own expense, provide for placing and maintaining such barricades, signs, flags, lights and flag persons as may be required to ensure public safety. The Contractor will be solely responsible for controlling traffic and shall appoint a representative to maintain the signs and warning lights at night, on weekends and holidays and at all other times that work is not in progress. All traffic control during construction shall be strictly in accordance with the **Occupational Health and Safety Act** and the current version of the **Ontario Traffic Manuals**.

Access to the electronic version of the **Ontario Traffic Manual** is available online through the MTO website, free of charge to all users. To access the electronic standards on the Web go to <http://www.mto.gov.on.ca/english/transrd/>, click on "Library Catalogue," under the "Title," enter "Ontario Traffic Manual" as the search. Open the applicable "Manual(s)" by choosing the "Access Key," once open look for the "Attachment," click the pdf file. Users require Adobe Acrobat to view all pdf files.

**Contractors are reminded of the requirements of the Occupational Health and Safety Act pertaining to Traffic Protection Plans for workers and Traffic Control Plan for Public Safety.**

#### **14.0 SITE CLEANUP AND RESTORATION**

As part of the work and upon completion, the Contractor shall remove and dispose of, off-site any loose timber, logs, stumps, large stones, rubber tires, cinder blocks or other debris from the drain bottom and from the side slopes. Where the construction works cross a lawn, the Contractor shall take extreme care to avoid damaging the lawn, shrubs and trees encountered. Upon completion of the work, the Contractor shall completely restore the area by the placement and fine grading of topsoil and seeding or sodding the area as specified by the Engineer or Drainage Superintendent.

#### **15.0 UTILITY RELOCATION WORKS**

In accordance with Section 26 of the Drainage Act, if utilities are encountered during the installation of the drainage works that conflict with the placement of the new culvert, the operating utility company shall relocate the utility at their own costs. The Contractor however will be responsible to co-ordinate these required relocations (if any) and their co-ordination work shall be considered incidental to the drainage works.

#### **16.0 FINAL INSPECTION**

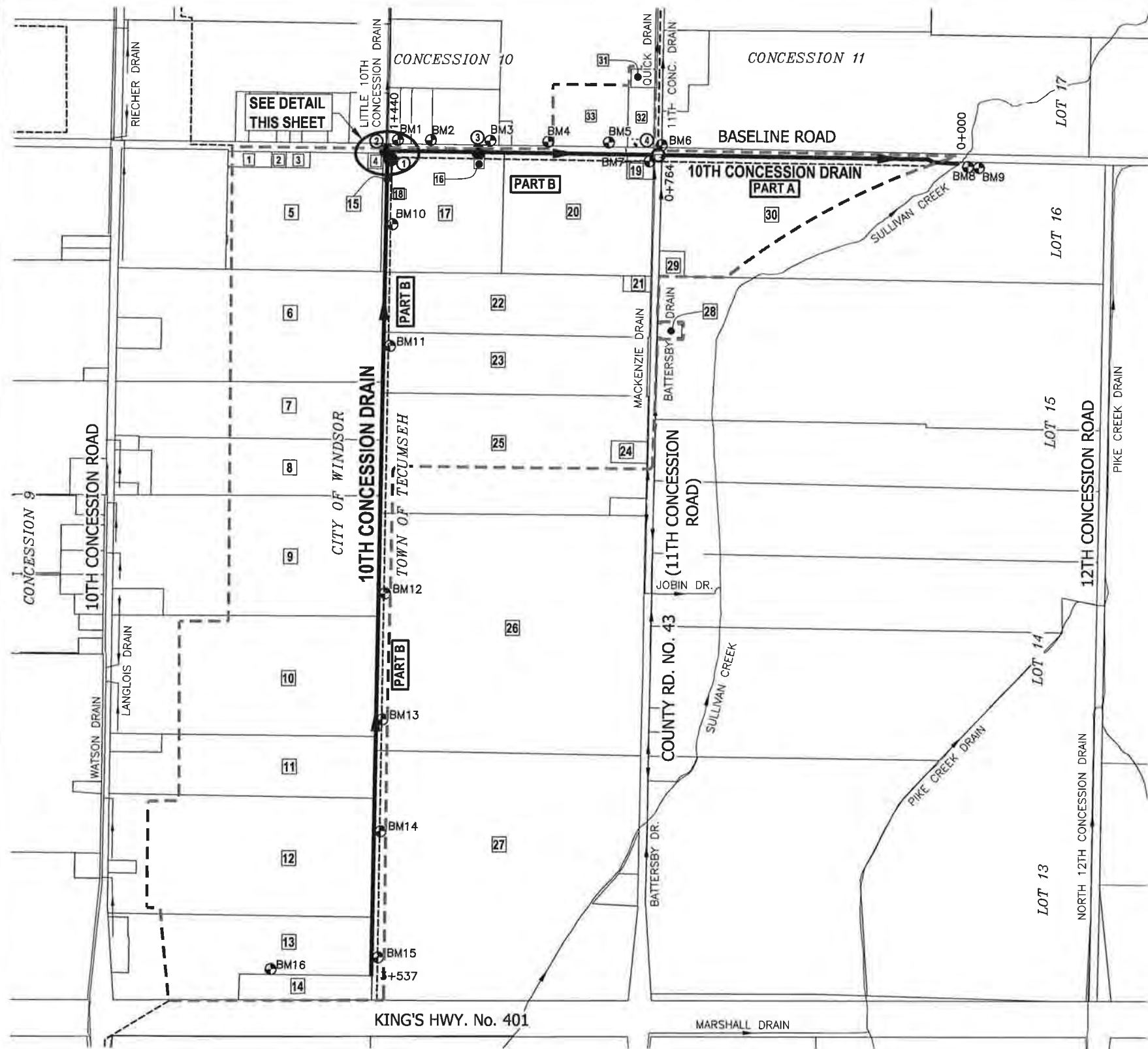
All work shall be carried out to the satisfaction of the Drainage Superintendent for the Municipality, in compliance with the specifications, drawings and the Drainage Act. Upon completion of the project, the work will be inspected by the Engineer and the Drainage Superintendent. Any deficiencies noted during the final inspection shall be immediately rectified by the Contractor.

Final inspection will be made by the Engineer within 20 days after the Drainage Superintendent has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

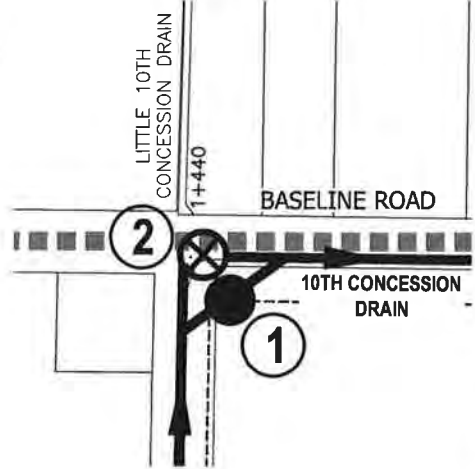
#### **17.0 FISHERIES CONCERNS**

Standard practices to be followed to minimize disruption to fish habitat include embedment of the culvert a minimum 10% below grade, constructing the work 'in the dry' and cutting only trees necessary to do the work (no clear-cutting). No in-water work is to occur during the timing window unless otherwise approved by the appropriate authorities.

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OVERALL PLAN  
SCALE 1:12,500



DETAIL  
NOT TO SCALE

#### WORKING AREAS

STATION 0+000 TO 0+764:  
SOUTH SIDE OF BASELINE ROAD TO  
9.0m SOUTH OF SOUTH BUFFER  
STRIP ON NEW OPEN DRAIN.

STATION 0+764 TO 1+466:  
SOUTH SIDE OF BASELINE ROAD TO  
9.0m SOUTH OF SOUTH BUFFER  
STRIP ON EXISTING OPEN DRAIN.

STATION 1+466 TO 3+537:  
9.0m EAST OF EAST BUFFER STRIP  
ON EXISTING OPEN DRAIN.

#### PART A

DRAIN RELOCATION

#### PART B

DRAIN CLEANOUT &  
ACCESS BRIDGE  
REPLACEMENTS

#### NOTE:

SITE BENCHMARKS-SEE PAGE 8 OF 8

#### Windsor Parcel Ownership 10th CONCESSION DRAIN

PARCEL NO	ROLL NO.	LOT, CON.	OWNER
1	090-030-06300	LOT 16, CON. 10	ROBERT R. & JUDY-ANN COUPE
2	090-030-06400	LOTS 45&46 PLAN 1351	THOMAS G. & MARIE S. CROUCHMAN
3	090-030-06500	LOTS 47, 86 TO 88 PLAN 1351	GREGORY MAXWELL
4	090-030-06700	LOT 16, CON. 10	ROUSIAN RAKHOUTINE & LILIA DEMENEVA
5	090-030-06600	LOTS 4 TO 41, 48 TO 85, 89 TO 173 PLAN 1351	JOSEPH A. & BRENDA A. GAGNON
6	090-030-06100	LOT 15, CON. 10	RAYMOND J. & ELAINE J. SIMARD
7	090-030-06000	LOT 15, CON. 10	1741077 ONTARIO INC.
8	090-030-05850	LOT 15, CON. 10	1433310 ONTARIO LTD
9	090-030-05600	LOT 14, CON. 10	GERALD F. & AGNES D. LAVIN
10	090-030-05400	LOT 14, CON. 10	NORBERT L. ST. LOUIS
11	090-030-05200	LOT 13, CON. 10	JOHN R. WILSON
12	090-030-05000	LOT 13, CON. 10	NORMAN P. & ROSE M. JOBIN
13	090-030-04800	LOTS 12&13, CON. 10	882885 ONTARIO LIMITED
14	090-030-04700	LOT 12, CON. 10	SANDWICH SOUTH FARMS LTD.

#### Tecumseh Parcel Ownership 10th CONCESSION DRAIN

PARCEL NO	ROLL NO.	LOT, CON.	OWNER
15			TOWN OF TECUMSEH
16	520-03800	LOT 16, CON. 10	DANIEL B. & NANCY K. EWING
17	520-03500	LOT 16, CON. 10	LEONARD MACKENZIE & CONNIE CAMPEAU
18	520-03400	LOT 16, CON. 10	JOSEPH & HELEN K. DIESBOURG
19	520-03901	LOT 16, CON. 10	CLIFFORD L. & CONNIE L. CAMPEAU
20	520-03900	LOT 16, CON. 10	LEONARD MACKENZIE & CONNIE CAMPEAU
21	520-03920	LOT 15, CON. 10	HERBERT HENRICKS
22	520-04000	LOT 15, CON. 10	SUSANNA MACKENZIE
23	520-04100	LOT 15, CON. 10	SANWARD ENTERPRISES INC.
24	520-04250	LOT 15, CON. 10	EDWARD T. & MELODIE A. VALEUR
25	520-04200	LOT 15, CON. 10	EDWARD J. CHITTLE
26	520-04400	LOT 14, CON. 10	NORMAN P. JOBIN
27	520-04500	LOT 13, CON. 10	SANDWICH SOUTH FARMS LTD.
28	510-02005	LOT 15, CON. 11	RUTH BATTERSBY
29	510-02010	LOT 16, CON. 11	LAURIE L. KNIGHT
30	510-02100	LOT 16, CON. 11	HELENE ANN BATTERSBY
31	560-03920	LOT 17, CON. 10	DAVID J. & GAYLE S. CLARKE
32	560-00300	LOT 17, CON. 10	ST. CLAIR BAPTIST CHURCH
33	560-03900	LOT 17, CON. 10	SUSANNA MACKENZIE

#### LEGEND

- 10TH CONCESSION DRAIN DRAINAGE AREA
- 10TH CONCESSION DRAIN
- OTHER DRAINS
- 9 METRE WORKING CORRIDOR
- BRIDGE REPLACEMENT
- EXISTING BRIDGE
- ⊗ FUTURE BRIDGE WORKS
- LOCAL BENCHMARK



#### Conditions of Use

Verify elevations and/or dimensions on drawing prior to use.  
Report any discrepancies to Dillon Consulting Limited

Do not scale dimensions from drawing

Do not modify drawing, re-use it, or use it for purposes other  
than those intended at the time of its preparation without prior  
written permission from Dillon Consulting Limited

No	ISSUED FOR	DATE	BY
3	FINAL REPORT	MAR 16/15	CDT
2	PRE-CONSIDERATION MEETING	FEB 19/15	CDT
1	CLIENT REVIEW	JAN 29/15	CDT

DESIGN	REVIEWED BY
CDT	JJT
DRAWN	CHECKED BY
DH	TRO
DATE	March 16, 2015
SCALE	AS SHOWN

PROJECT NO.	13-8559
DRAWING SCALES BASED ON A 11" X 17" SHEET	

#### 'SCHEDULE G'

Drainage Report for the  
10th CONCESSION DRAIN  
City of Windsor & Town of Tecumseh

SHEET TITLE

OVERALL PLAN

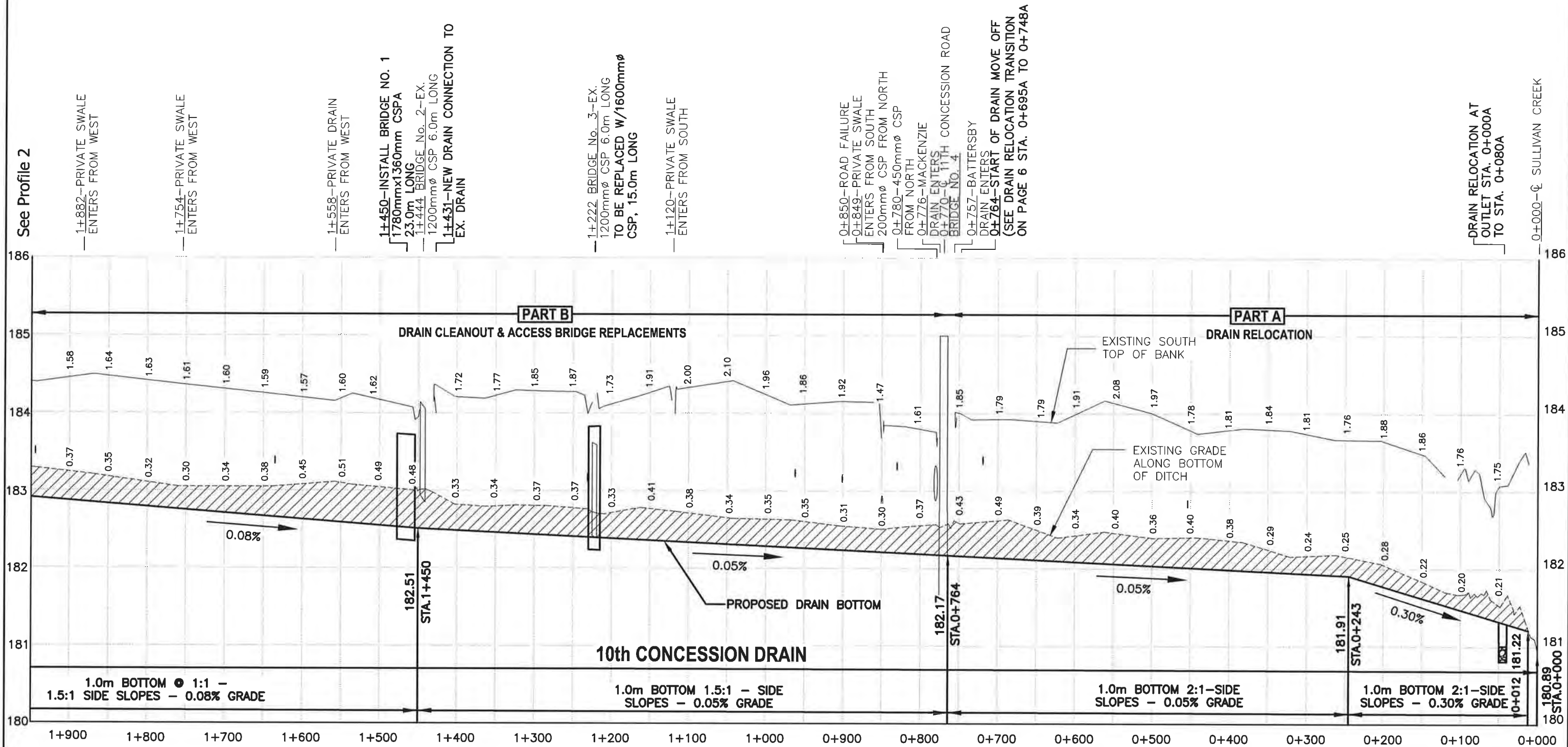
PAGE NO.

1 of 8



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See Profile 2



PROFILE STA. 0+000 TO 1+950

SCALE HORIZ. 1:5000  
VER. 1:50



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3 FINAL REPORT

MAR 16/15

CDT

2 PRE-CONSIDERATION MEETING

FEB 19/15

CDT

1 CLIENT REVIEW

JAN 29/15

CDT

No. ISSUED FOR

DATE

BY

DESIGN

CDT

REVIEWED BY

JJT

DRAWN

DH

CHECKED BY

TRO

DATE

March 16, 2015

SCALE

AS SHOWN

PROJECT NO.

13-8559

DRAWING SCALES BASED

ON A 11" X 17" SHEET

#### 'SCHEDULE G'

Drainage Report for the  
10th CONCESSION DRAIN  
City of Windsor & Town of Tecumseh

SHEET TITLE

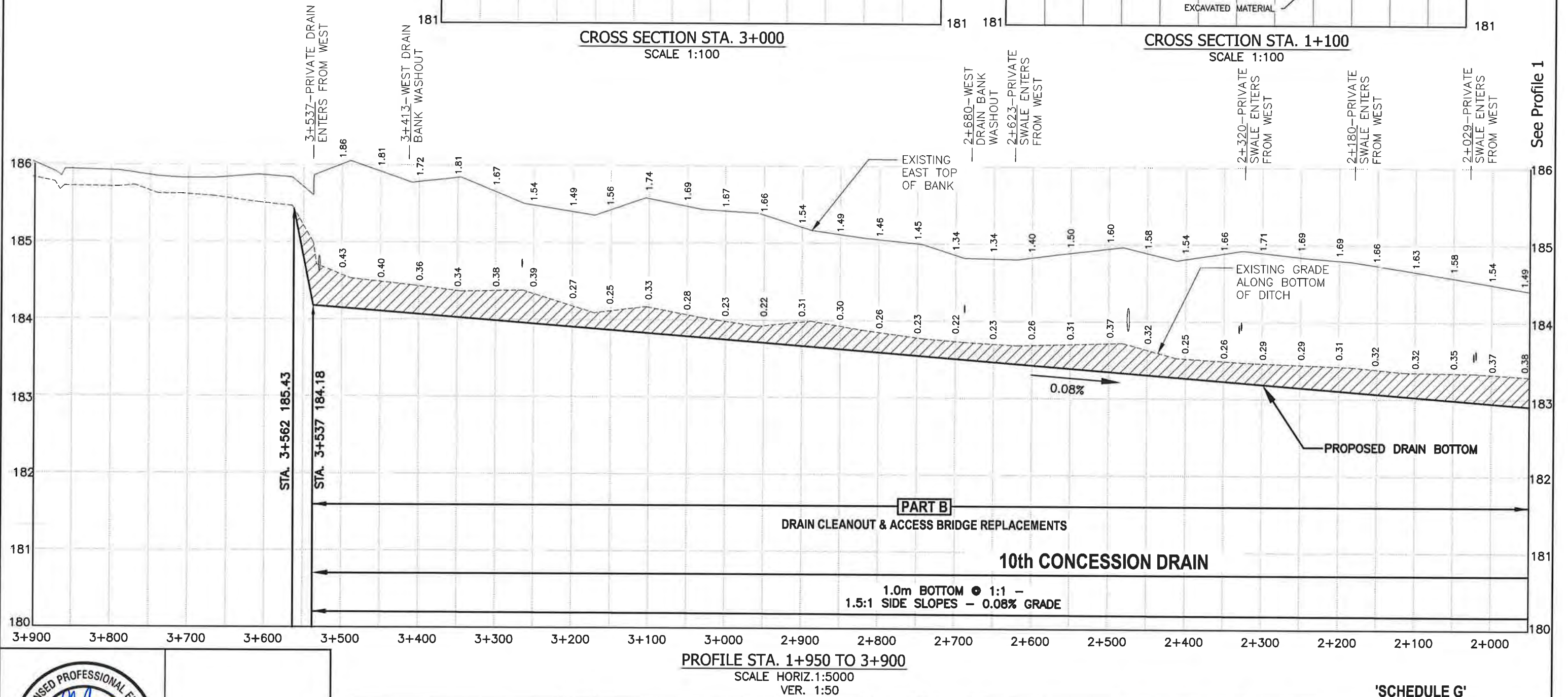
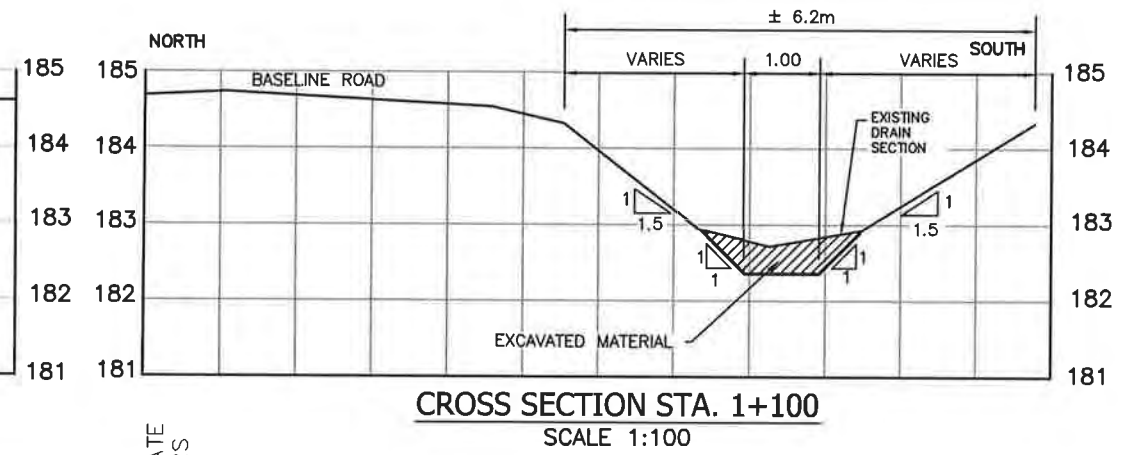
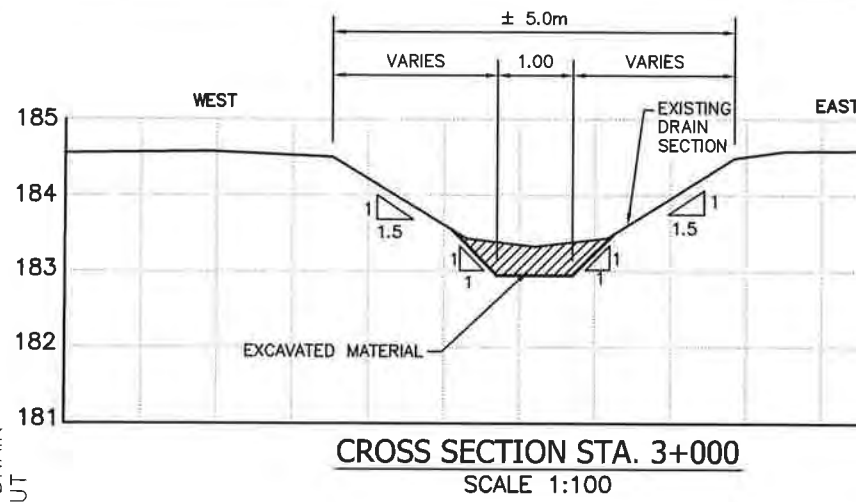
PROFILE 1

PAGE NO.

2 of 8



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DRAWN	DH	CHECKED BY	TRO
DATE	March 16, 2015		
SCALE	AS SHOWN		



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#### 'SCHEDULE G'

Drainage Report for the  
10th CONCESSION DRAIN  
City of Windsor & Town of Tecumseh

SHEET TITLE

#### PROFILE 2

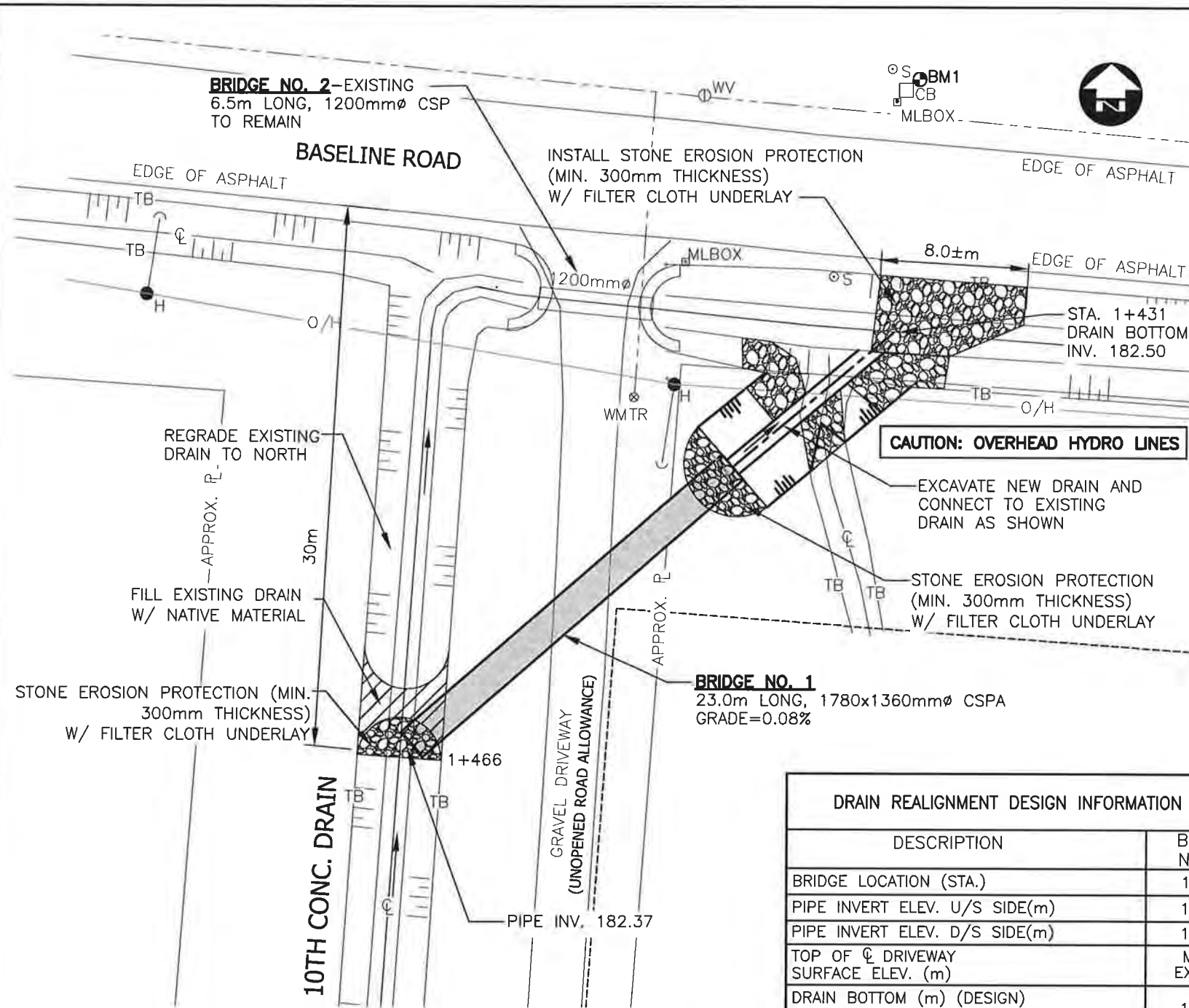
PAGE NO.

3 of 8

See Profile 1



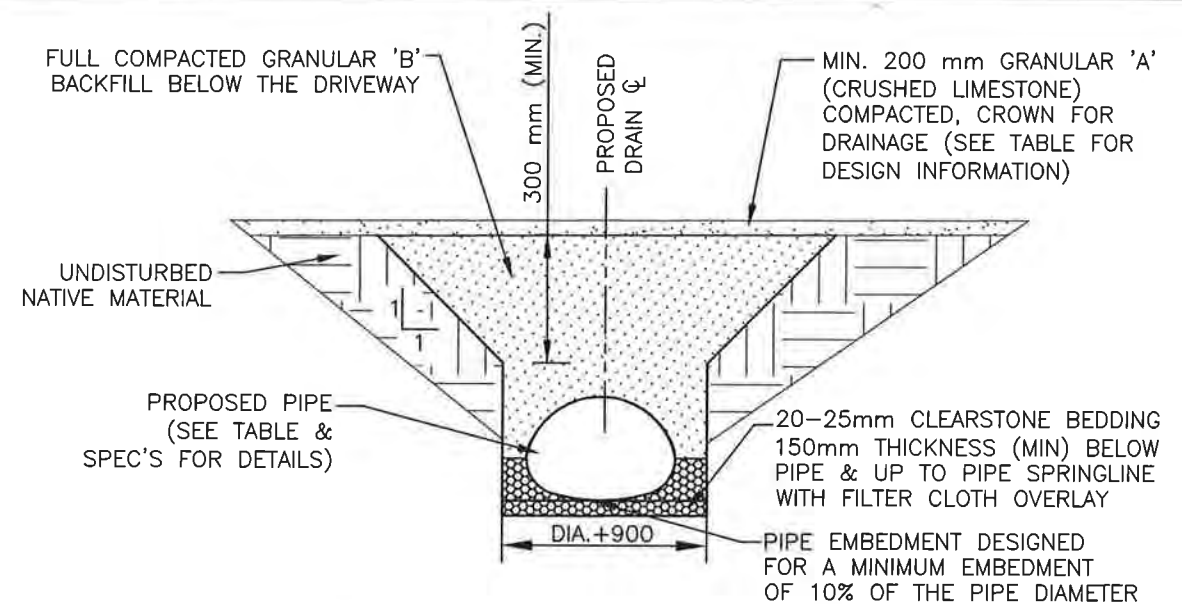
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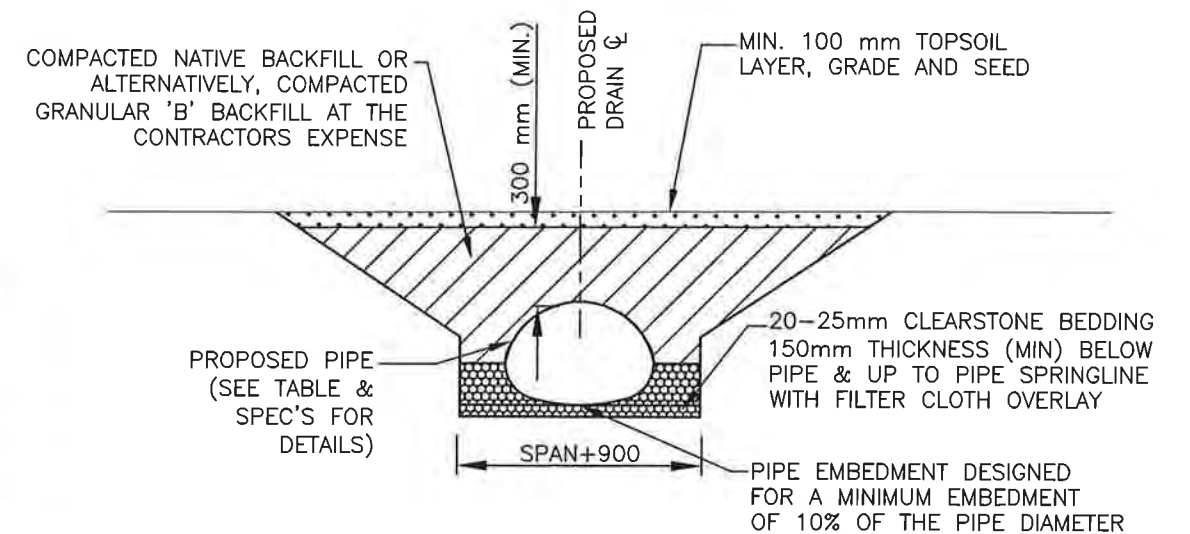
**DRAIN REALIGNMENT DETAIL**  
**BRIDGE NO. 1 STA. 1+450**  
SCALE 1:300

**CAUTION: CONTRACTOR TO LOCATE & EXPOSE ALL UTILITIES PRIOR TO ANY CONSTRUCTION & COORDINATE ANY POSSIBLE RELOCATIONS WITH DRAINAGE SUPERINTENDENT**

DRAIN REALIGNMENT DESIGN INFORMATION	
DESCRIPTION	BRIDGE NO. 1
BRIDGE LOCATION (STA.)	1+450
PIPE INVERT ELEV. U/S SIDE(m)	182.37
PIPE INVERT ELEV. D/S SIDE(m)	182.35
TOP OF $\phi$ DRIVEWAY SURFACE ELEV. (m)	MATCH EXISTING
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	182.52
MIN. TOP WIDTH OF DRIVEWAY (m)	3.0
MIN. CULVERT GRADE (%)	0.08%
CULVERT TYPE	CSPA
CULVERT MATERIAL	ALUM.
CULVERT LENGTH (m)	23.0
CULVERT THICKNESS (mm)	2.8
CULVERT CORRUGATIONS (mm)	125x25
PIPE SIZE (mm)	1780x1360
CULVERT ENDWALL TYPE	SLOPING



**CROSS SECTION UNDER DRIVEWAY**  
N.T.S



**CROSS SECTION OUTSIDE OF DRIVEWAY**  
N.T.S



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DESIGN	CDT	REVIEWED BY	JJT
DRAWN	DH	CHECKED BY	TRO
DATE	March 16, 2015		
SCALE	AS SHOWN		

PROJECT NO.	13-8559
DRAWING SCALES BASED ON A 11" X 17" SHEET	

**'SCHEDULE G'**

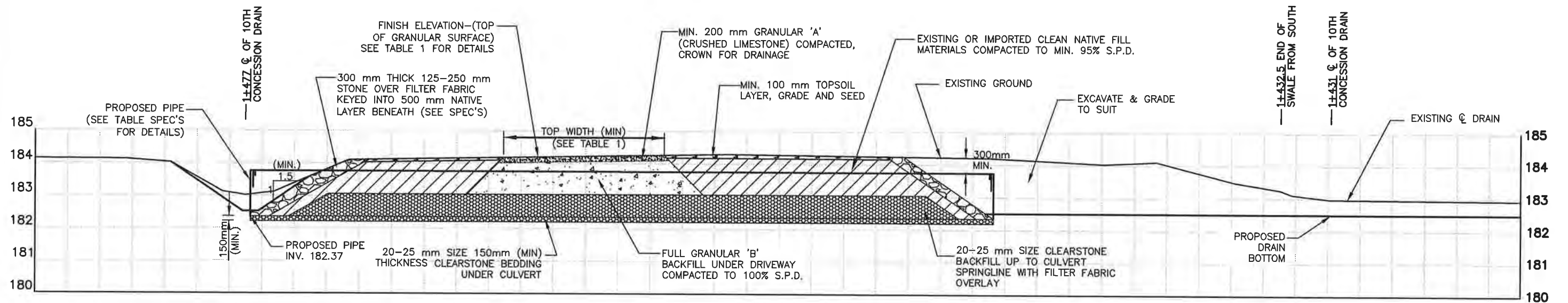
Drainage Report for the  
**10th CONCESSION DRAIN**  
City of Windsor & Town of Tecumseh

SHEET TITLE  
**DRAIN REALIGNMENT DETAIL**

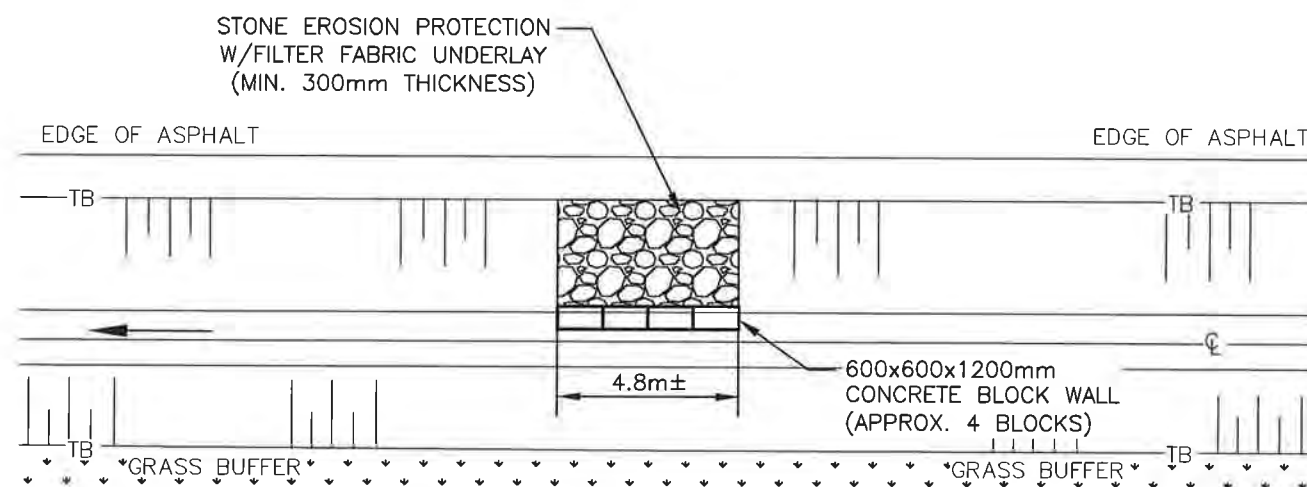
PAGE NO  
4 of 8



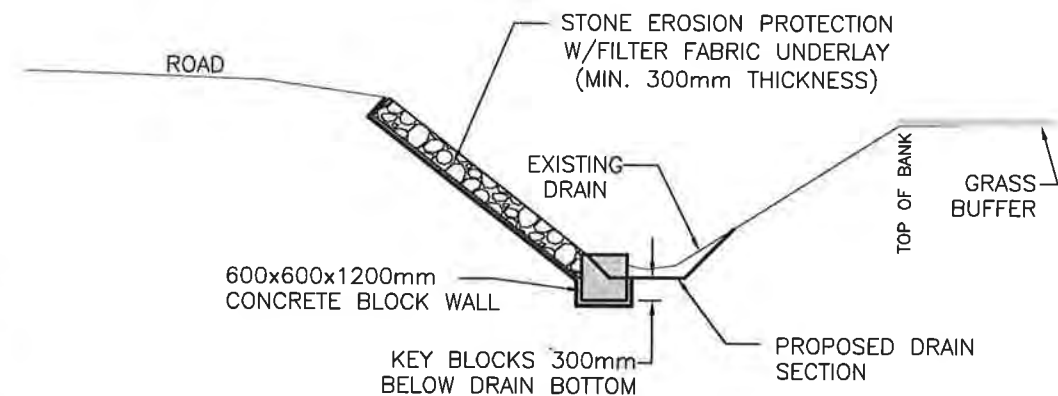
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DRAIN REALIGNMENT LONGITUDINAL SECTION (STA. 1+431 TO 1+467)  
SCALE HORIZ. 1:125  
VER. 1:125



BANK PROTECTION PLAN STA. 0+850  
NOT TO SCALE



BANK PROTECTION CROSS SECTION STA. 0+850  
NOT TO SCALE



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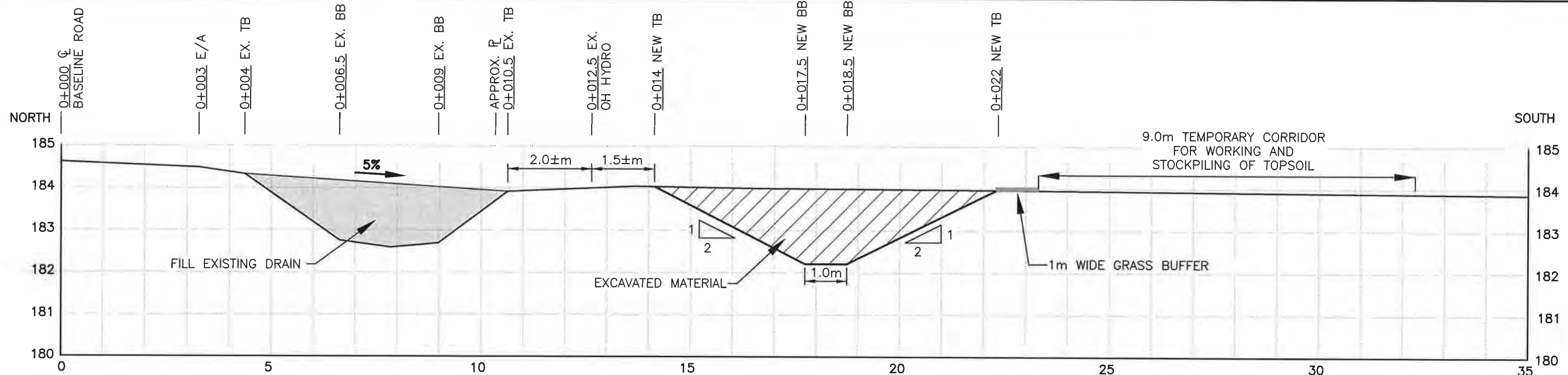
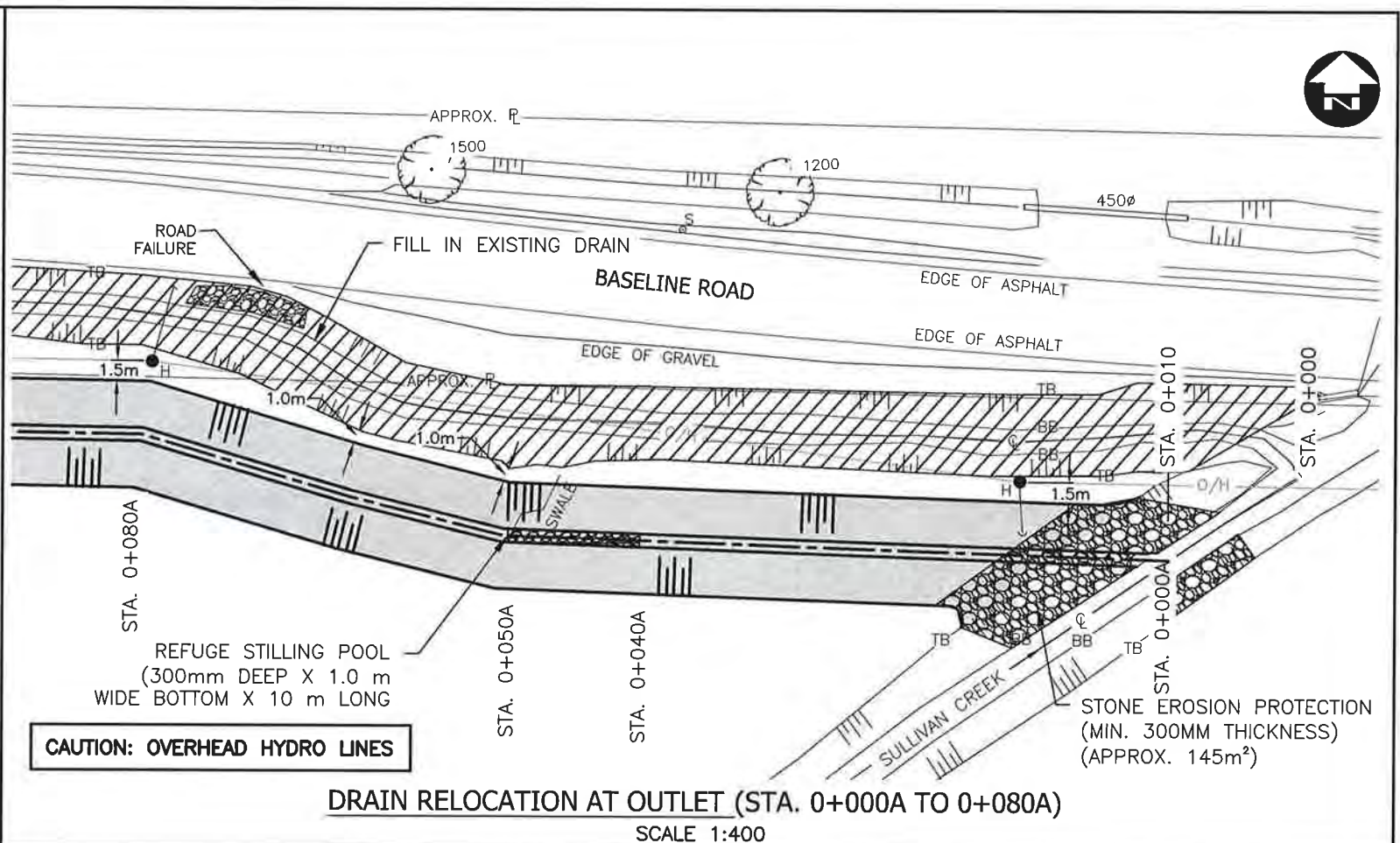
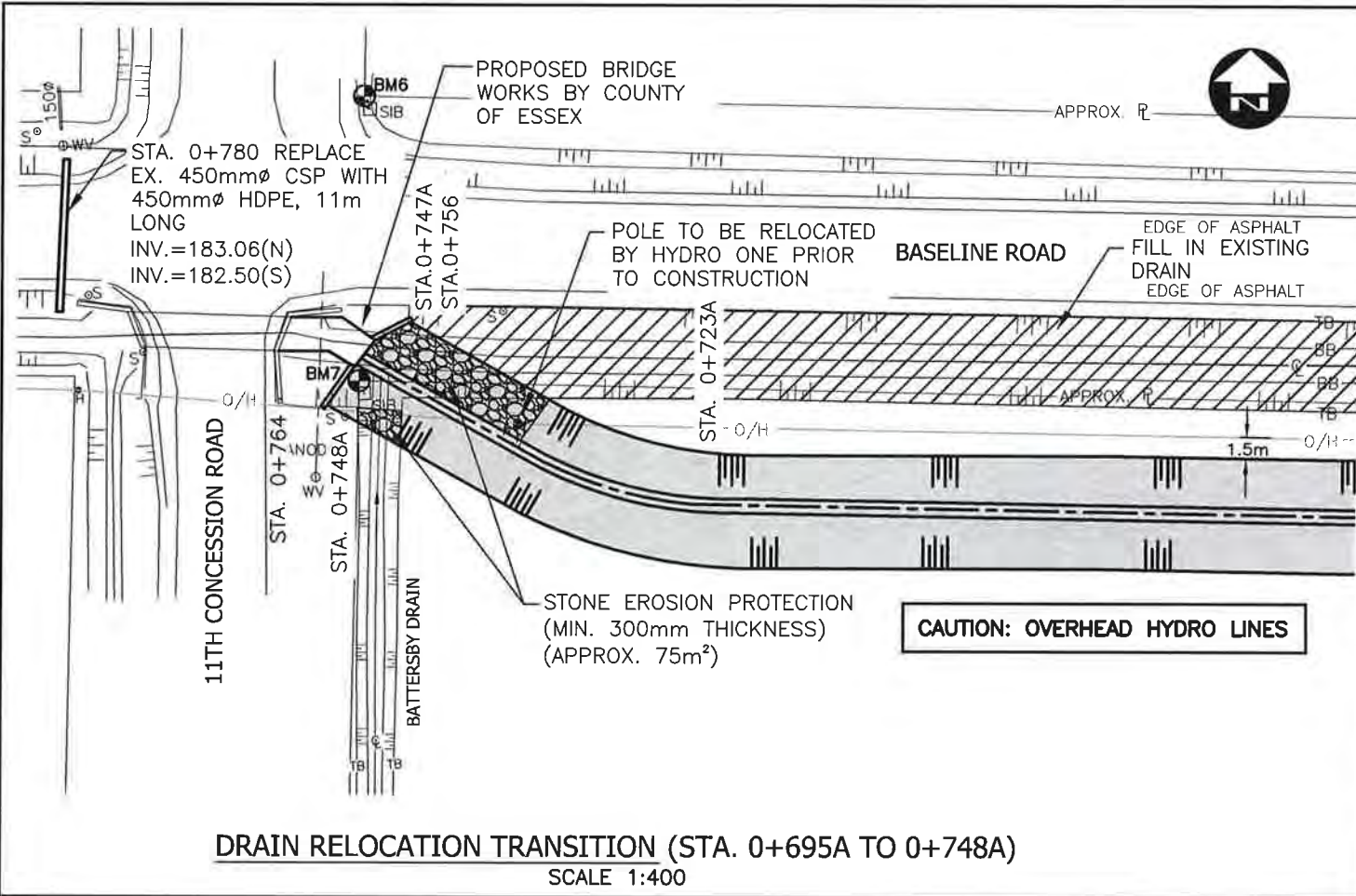
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SCALE	AS SHOWN		

 PROJECT NO. 13-8559	DRAWING SCALES BASED ON A 11" X 17" SHEET

#### 'SCHEDULE G'

Drainage Report for the 10th CONCESSION DRAIN City of Windsor & Town of Tecumseh	
SHEET TITLE DRAIN REALIGNMENT SECTION	PAGE NO. 5 of 8





DRAIN RELOCATION FROM ST. 0+000 TO 0+748A  
LOOKING DOWNSTREAM  
SCALE=1:100

LICENSED PROFESSIONAL ENGINEER  
C.D. THIBERT  
100139162  
16-Mar-15  
PROVINCE OF ONTARIO

**Conditions of Use**

Verify elevations and/or dimensions on drawing prior to use  
Report any discrepancies to Dillon Consulting Limited

Do not scale dimensions from drawing

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3	FINAL REPORT	MAR 16/15	CDT
2	PRE-CONSIDERATION MEETING	FEB 19/15	CDT
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No	ISSUED FOR	DATE	BY

DESIGN	REVIEWED BY
CDT	JJT
DRAWN	CHECKED BY
DH	TRO
DATE	March 16, 2015
SCALE	AS SHOWN

**DILLON CONSULTING**

PROJECT NO 13-8559

DRAWING SCALES BASED ON A 11" X 17" SHEET

**'SCHEDULE G'**

Drainage Report for the  
10th CONCESSION DRAIN  
City of Windsor & Town of Tecumseh

SHEET TITLE  
**DRAIN RELOCATION DETAILS**

PAGE NO 6 of 8



Mar 13, 2015 - 2:55pm G:\CAD\138559-10th Con Drain\03-Drainage\02-Design\138559-Details (FINAL Mar 2015).dwg

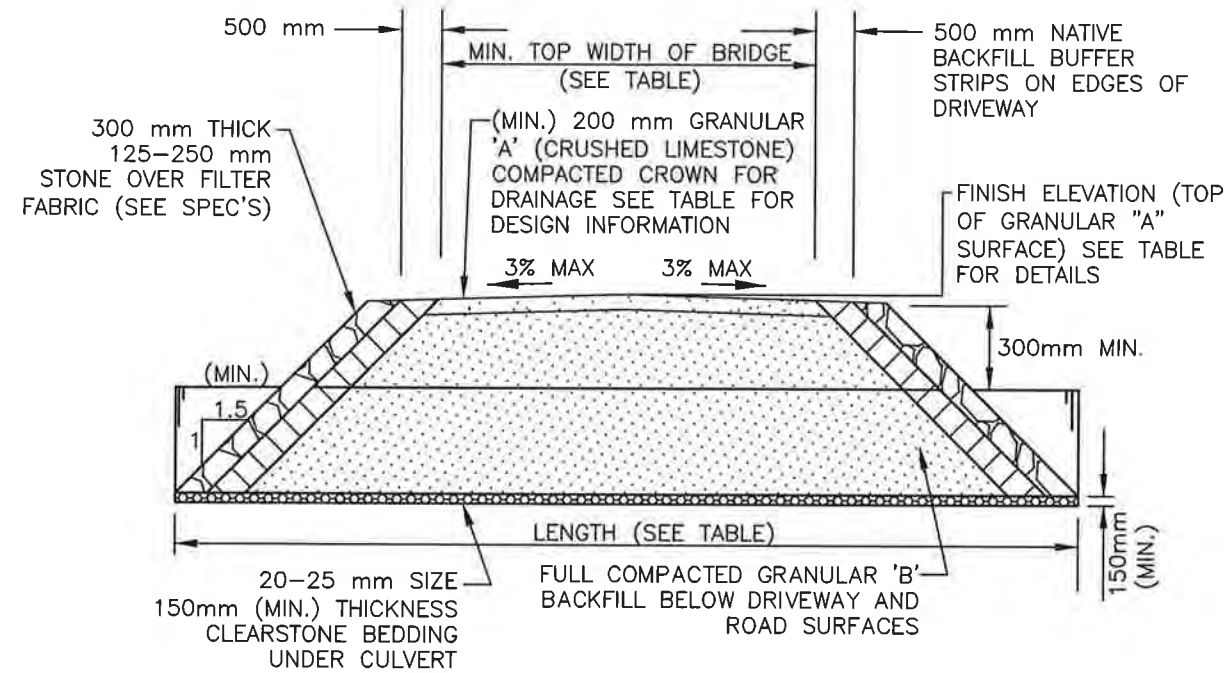
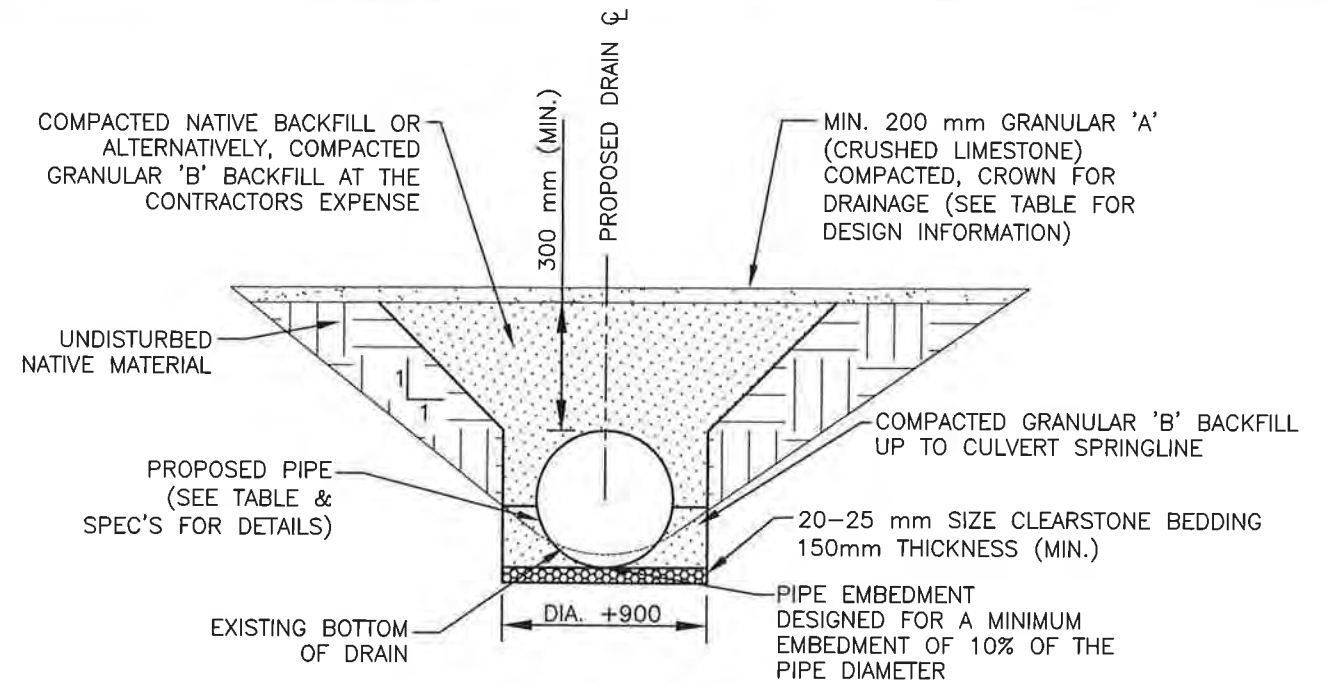
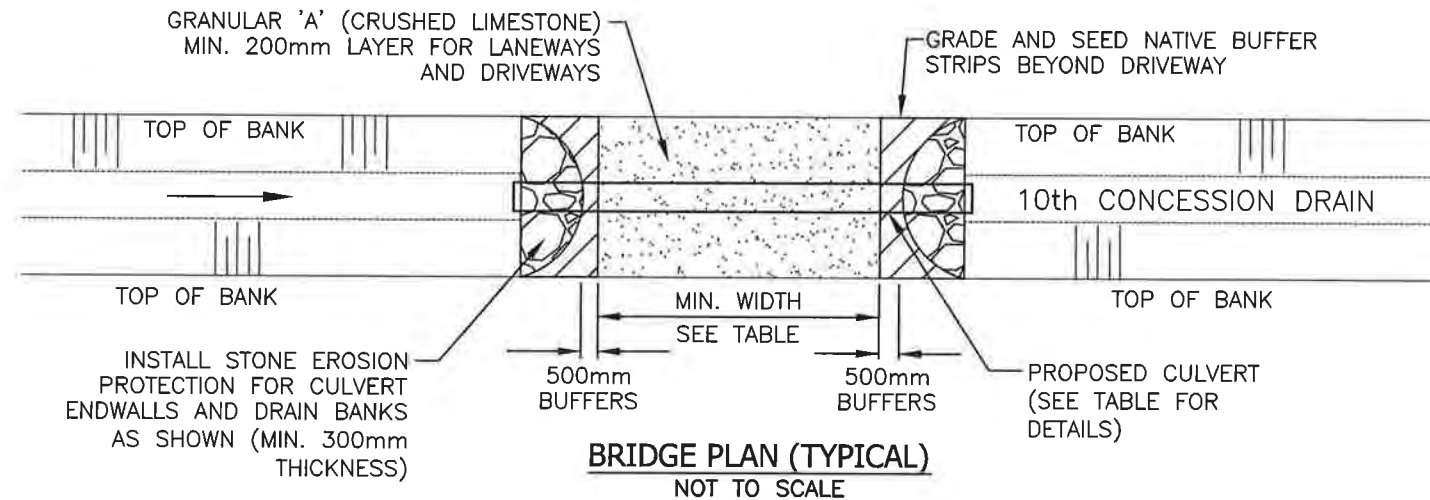


TABLE 1 - ACCESS CULVERT DESIGN INFORMATION

DESCRIPTION	BRIDGE No.2 (FUTURE)	BRIDGE No.3
BRIDGE LOCATION (STA.)	1+444	1+222
PIPE INVERT ELEV. U/S SIDE(m)	182.46	182.27
PIPE INVERT ELEV. D/S SIDE(m)	182.44	182.25
TOP OF & DRIVEWAY SURFACE ELEV. (m)	184.40	184.56
DRAIN BOTTOM (m) (DESIGN) (AT CENTRELINE OF CULVERT)	182.50	182.41
MIN. TOP WIDTH OF DRIVEWAY (m)	6.1	6.1
MIN. CULVERT GRADE (%)	0.10%	0.10%
CULVERT TYPE	CSP	CSP
CULVERT MATERIAL	ALUM.	ALUM.
CULVERT LENGTH (m)	14.0	15.0
CULVERT THICKNESS (mm)	2.8	2.8
CULVERT CORRUGATIONS (mm)	125x25	125x25
PIPE SIZE (mm)	1200	1600
CULVERT ENDWALL TYPE	SLOPING	SLOPING



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Drainage Report for the  
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SHEET TITLE

BRIDGE DETAILS

PAGE NO.

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Mar 13, 2015 - 2:55pm G:\CAD\138559 10th Con Drain\03-Drainage\02-Design\138559-Detail (FINAL Mar 2015).dwg

**BENCHMARKS**

BM1 TOP OF CB NORTH SIDE BASELINE ROAD 20.0m NORTHEAST OF EXISTING BRIDGE.

ELEVATION=184.27m

BM2-(STA. 1+344) TOP OF FIRE HYDRANT NORTH SIDE OF BASELINE ROAD.

ELEVATION=184.96m

BM3-(STA. 1+192) TOP OF FIRE HYDRANT NORTH SIDE OF BASELINE ROAD.

ELEVATION=185.03m

BM4-(STA. 1+044) TOP OF FIRE HYDRANT NORTH SIDE OF BASELINE ROAD.

ELEVATION=185.02m

BM5-(STA. 0+892) TOP OF FIRE HYDRANT NORTH SIDE OF BASELINE ROAD.

ELEVATION=185.04m

BM6-TOP OF SIB NE CORNER OF BASELINE ROAD AND 11th CONCESSION ROAD.

ELEVATION=184.00m

BM7-TOP OF SIB SE CORNER OF BASELINE ROAD AND 11th CONCESSION ROAD.

ELEVATION=183.64m

BM8-TOP OF IB ON THE SOUTH SIDE OF BASELINE ROAD, EAST OF SULLIVAN CREEK 7.5m EAST OF  $\phi$  FIELD ENTRANCE.

ELEVATION=183.41m

BM9-NAIL IN NORTH FACE OF HYDRO POLE ON SOUTH SIDE BASELINE ROAD 19.0m SE OF  $\phi$  FIELD ENTRANCE.

ELEVATION=184.36m

BM10-(STA. 1+638) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=184.54m

BM11-(STA. 1+945) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=184.20m

**BENCHMARKS**

BM12-(STA. 2+569) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=184.92m

BM13-(STA. 2+888) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=185.09m

BM14-(STA. 3+171) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=185.49m

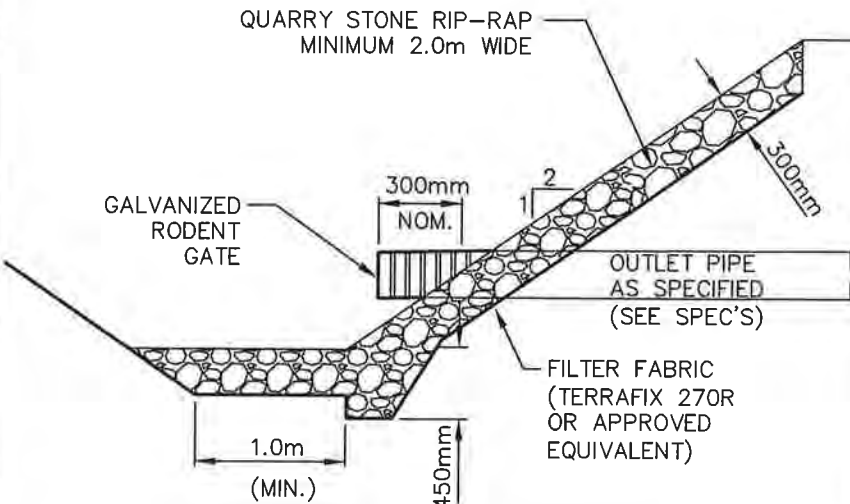
BM15-(STA. 3+490) TOP OF 10mm $\phi$  STEEL PIN ON EAST TOP OF BANK.

ELEVATION=186.09m

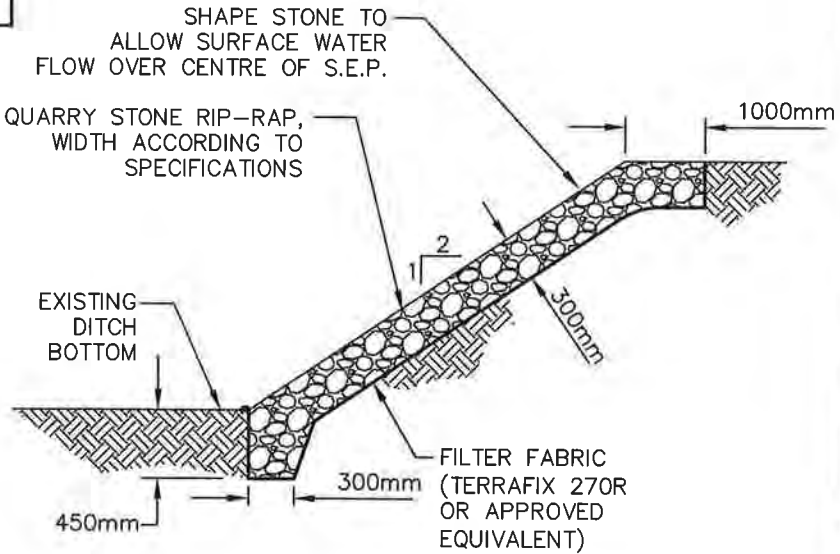
BM16-(STA. 3+788) TOP OF IB NORTH SIDE OF PRIVATE DRAIN.

ELEVATION=186.13m

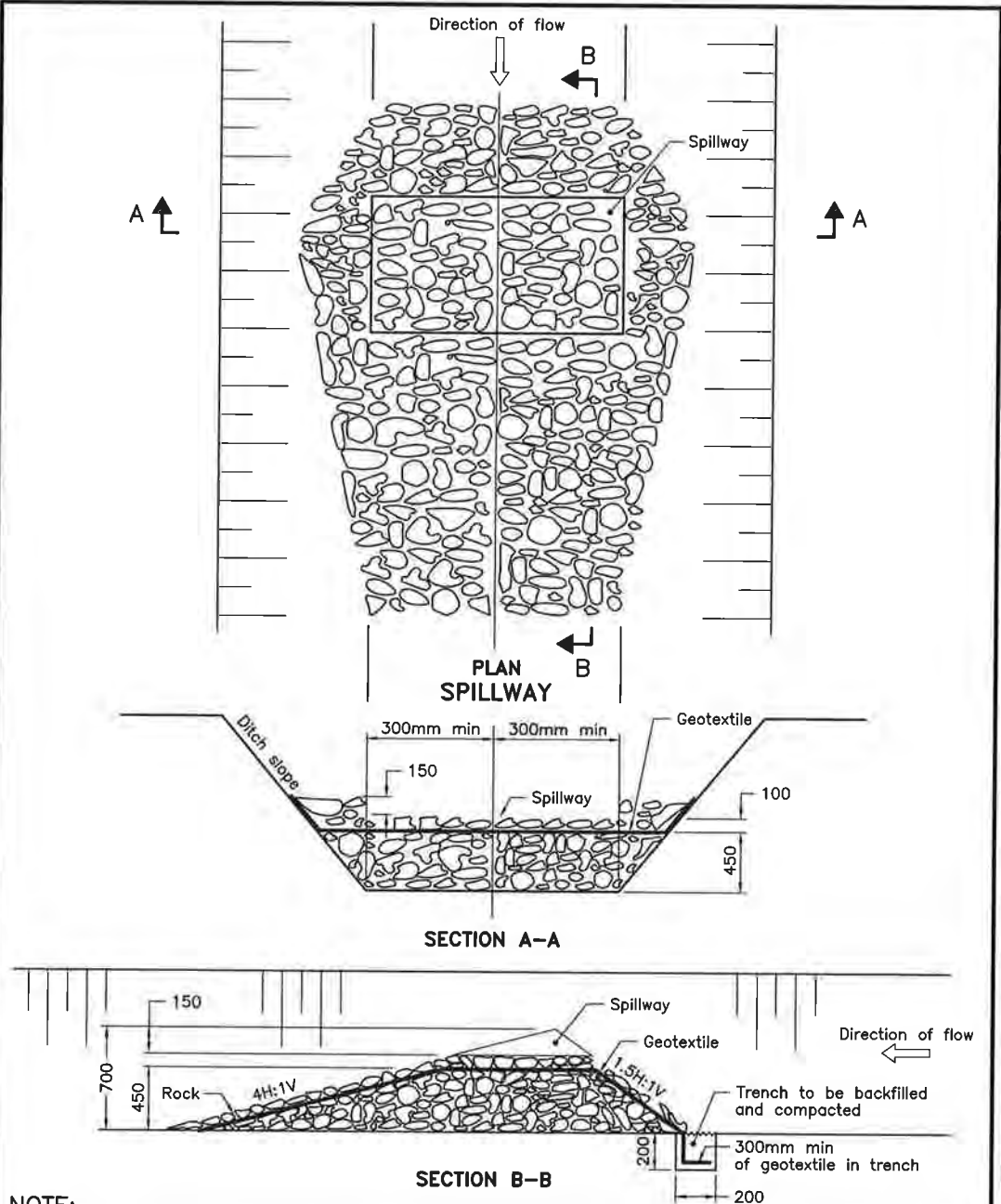
**NOTE: CONTRACTOR TO VERIFY BENCHMARKS PRIOR TO CONSTRUCTION.**



**TYPICAL HDPE TILE OUTLET**  
NOT TO SCALE



**TYPICAL DRAIN BANK SPILLWAY**  
**DETAIL w/ RIP-RAP**  
NOT TO SCALE



**NOTE:**  
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2006 Rev 1

**ROCK FLOW CHECK DAM**  
FLAT BOTTOM DITCH

**OPSD 219.211**



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Drainage Report for the  
**10th CONCESSION DRAIN**  
City of Windsor & Town of Tecumseh

SHEET TITLE  
**MISCELLANEOUS DETAILS**

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