



**Branch 'A' of the Mills-  
South Norwich Municipal  
Drain**

August 22, 2025

Prepared for:



Kitchener, Ontario  
August 22, 2025

To the Mayor and Members of Council:

**Re: Branch 'A' of the Mills-South Norwich Municipal Drain  
Norfolk County  
Former Township of Middleton  
Our Reference No. NRFLK-005**

Headway Engineering is pleased to provide its report for **Branch 'A' of the Mills-South Norwich Municipal Drain** in Norfolk County, former Township of Middleton.

The preparation of this report was authorized by a resolution of the Council of Norfolk County on July 11, 2023, per Section 4 of the Drainage Act.

The primary objective of this report is to provide the Stubbe's Property Development property (Roll No. 20-634) a legal and sufficient outlet for their proposed residential development. This report recommends the construction of a closed municipal drain commencing from an outlet into the Mills-South Norwich Drain in Part Lot 24, Concession 1 STR and extends upstream to the west side of the Stubbe's Property Development property (Roll No. 20-634) in Part Lot 25, Concession 1 STR, former Township of Middleton.

A summary of the assessments for this project are as follows:

Municipal Lands	\$1,523
Privately Owned Lands	\$146,577
<b>Total Estimated Assessments</b>	<b>\$148,100</b>

Yours truly,

Stephen Brickman, P.Eng.  
Project Engineer and Manager



Adam Hall  
Project Coordinator  
**HEADWAY ENGINEERING**

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## SPECIFICATIONS FOR THE CONSTRUCTION OF MUNICIPAL DRAINAGE WORKS

## **1.0 INTRODUCTION AND LOCATION**

The Council of Norfolk County has appointed Headway Engineering to investigate a petition for a new municipal drainage works. The project services parts of Lot 25, Concession 1 STR, in the former Township of Middleton, Norfolk County.

The Drainage Area serviced by the new branch comprises of approximately 4.23 hectares, and land uses within the watershed include existing residential, future residential and roads.

The attached Plans, Profiles and Details: Drawing Number 1, by Headway Engineering, and Drawing No. 6.3 by Strik Baldinelli Moniz Ltd. (SBM Ltd.), show and describe in detail the location and extent of the work to be completed and the lands which are affected.

## **2.0 PROJECT AUTHORIZATION**

Authority to prepare a report was obtained by a resolution of Norfolk County Council at its July 11, 2023 meeting to appoint Headway Engineering to prepare a report under Section 4(1) of the Drainage Act.

The area requiring drainage is the Stubbe's Property Development property (Roll No. 20-634), herein referred to as the 'development property', part of Lot 25, Concession 1 STR. The area requires a legal outlet to safely discharge drainage waters to a sufficient outlet. The petition is valid in accordance with Section 4(1)(a) of the Drainage Act.

## **3.0 DRAINAGE HISTORY**

### **3.1 Mills-South Norwich Municipal Drain 1898**

The Mills-South Norwich Drain was originally constructed under the authority of a report by James A. Bell, dated January 20, 1898. This report provided outlet for lands in the former Township of South Norwich. The system's outlet was into a ravine north of Highway 3.

### **3.2 Mills-South Norwich Municipal Drain 1943**

A second report, prepared by Fred A. Bell, dated June 10, 1943, provided for a cleanout of approximately 1,754 feet of the lower portion of the drain.

### **3.3 Mills-South Norwich Municipal Drain 1979**

Since the original construction, numerous changes to the internal watershed and surrounding watersheds altered the drainage patterns significantly. This led to a third report prepared by K. E. Weselan, P.Eng., dated January 3, 1979. This 1979 report provided for a reconstruction of the drain as an open ditch throughout its entire length, a 400 foot extension of the drain south of Highway 3 and a new schedule of assessment for maintenance purposes.

### **3.4 Mills-South Norwich Municipal Drain 2018**

Finally, a report dated November 23, 2018, prepared by Spriet Associates London Limited incorporated an existing drainage channel running south of Highway 3 to Little Otter Creek. This



incorporation allowed for a natural outlet into the Little Otter Creek for the Mills-South Norwich Drain and implemented some erosion control design elements into the project including tree planting, rock chutes and bank flattening to maintain the structure of the drain due to the meandering natural water course.

#### 4.0 PUBLIC MEETINGS AND ENGAGEMENTS

##### 4.1 On-Site Meeting

Per Section 9(1) of the Drainage Act, an on-site meeting was held at the Delhi Library on August 30, 2023.

Persons in attendance were:

Stephen Brickman, P.Eng.	Headway Engineering
Adam Hall	Headway Engineering
Chris Dunn	Norfolk County Drainage Superintendent
Albert Meyer	Stubbe's Property Development Inc.
Ben Hyland	SBM Ltd.

A preliminary plan showing the watershed was distributed in advance of the meeting.

##### 4.2 Public Information Meeting

A Public Information Meeting was held on December 6, 2023. All landowners within the watershed area, as well as the necessary environmental agencies, were invited to attend. Persons in attendance were:

Stephen Brickman, P.Eng.	Headway Engineering
Adam Hall	Headway Engineering
Chris Dunn	Norfolk County Drainage Superintendent
Krista VanPaemel	Norfolk County Drainage Clerk
Ben Hyland	SBM Ltd.
Sandra Tibocho	Landowner

This meeting provided a review of the design of the proposed drainage system, the estimated costs of the project, and the proposed assessments for the project.

Following the meeting, a drainage report was prepared on January 26, 2024. Afterward, changes to the development design were required. Out of diligence, processing of the report was suspended until those modifications were finalized. Once confirmed, this report was filed.

#### 5.0 FINDINGS

The following summarizes Headway Engineering's findings based on the information collected during field investigations, surveys, public engagements, and review of documentation:

##### 5.1 Watershed Condition (Hydrology):

- The watershed was established through the analysis of tile drainage maps, previous engineers' reports for internal and surrounding systems, field investigations, surveys, and data analysis of the LiDAR Derived survey of the Lake Erie drainage basin. The drainage area comprises of approximately 4.68 hectares.
- Land uses within the watershed are summarized as follows:



- Roads (and Proposed roads) – 0.63 Ha (13%)
- Residential (and proposed residential) – 4.05 Ha (87%)
- The Ontario Ministry of Agriculture, Food and Agribusiness's Agricultural Information Atlas describes the soil type within the watershed and along the route of the drain as Sandy Silt.

#### 5.2 Existing Drainage System:

- There are currently no existing municipal drains servicing the petitioner's property.
- The land contour may generally be described as sloping south on the petitioner's property, where existing surface flows would then generally flow either east or west adjacent to the north side of the railway property.

#### 5.3 Outlet:

- The outlet for the proposed drainage system is the Mills-South Norwich Municipal Drain on Lot 24, Concession 1 STR.
- The construction of Branch 'A' of the Mills-South Norwich Municipal Drain, as proposed in this report, can be discharged safely into its outlet such that this construction will not cause damage. The Mills-South Norwich Municipal Drain may need repair at locations along its length. These improvements involve a significantly greater watershed and must be addressed under separate cover.

#### 5.4 Proposed Development

- Stubbe's Property Development (Roll No. 20-634) is proposing to develop 12 residential lots, an internal road, and a stormwater management (SWM) facility on their property (Part of Lot 25, Concession 1 SDR), per the drawings and details in a Functional Servicing Report (FSR) prepared by SBM Ltd. dated June 27, 2025.
- The proposed outlet for the SWM facility as indicated in the SBM Ltd. design submission, consists of a 375mm diameter storm drain with a grades of 0.60% and 0.63%.
- A small portion of the development property drains toward the southeast corner of the property where surface flows enter a controlled drainage system along the north side of the railway property. The following is noted:
  - The post-development contributing area to the southeast is significantly smaller than the pre-development contributing area. Approximately 95% reduction in contributing area.
  - The post-development flow rates are predicted to be about 50% to 82% lower than pre-development flow rates leaving the property, depending on the rainfall event. These estimates are extracted from the FSR prepared by SBM Ltd. dated June 27, 2025.

#### 5.5 Environmental Requirements:

- The Long Point Region Conservation Authority (LPRCA) requires a permit to alter a watercourse.



## 6.0 DESIGN CONSIDERATIONS

The proposed drainage system is designed to convey the controlled flows from the stormwater management facility located at the southwest corner of the development property.

The drainage system is to be installed along an alignment parallel to the existing railroad, while remaining on private property.

Pipe materials were selected based on location and intended land uses adjacent to the drainage system.

The overland flow channel is designed to convey emergency flows in a controlled manner to the Mills-South Norwich Municipal Drain.

## 7.0 ENVIRONMENTAL CONSIDERATIONS AND PERMITTING

### 7.1 Department of Fisheries and Oceans (DFO)

The work proposed under this report primarily consists of the new construction of a closed drainage system. There are no in-water works proposed or required. Therefore, the works do not cause death of fish, permanent alteration, or destruction of fish habitat. Likewise, the participation of DFO is not required.

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

Headway Engineering completed a review of the Natural Heritage Information Centre mapping for Species At Risk in Ontario. Provincial Species at Risk requiring special consideration are not anticipated in the working area.

### 7.2 Long Point Region Conservation Authority (LPRCA)

The LPRCA has been included on the circulation list for this report and has been notified of all public engagements. The LPRCA will require a permit to alter a watercourse. Likewise, Headway Engineering forwarded design discussions, drawings, and a completed permit application to the LPRCA on January 25, 2024, for comment. On August 21, 2025, Norfolk County submitted updated materials to reflect modifications made since January 2024.

## 8.0 RECOMMENDATIONS

Headway Engineering recommends the following:

1. A new municipal drainage system be installed from the outlet into the Mills-South Norwich Drain on the Netherlands Reformed Congregation property (Roll No. 20-631-00) and extending upstream to the west side of the development property (Roll No. 20-634-00).
2. The proposed drainage system includes the installation of approximately 260 metres of 375mm diameter HPDE pipe and the construction of approximately 254m of overland flow channel for emergency use.
3. The new municipal drainage system shall be known as **“Branch ‘A’ of the Mills-South Norwich Drain”**.
4. Headway Engineering also recommends that the watersheds of the surrounding municipal drains be updated when those drainage systems are revisited in the future.



## 9.0 SUMMARY OF PROPOSED WORKS

The proposed work consists of:

1. The installation of approximately 260 metres of 375mm diameter HDPE pipe.
2. The construction of approximately 254 metres of overland flow channel.
3. The installation of one concrete manhole.
4. The placement of rip-rap outlet protection.

## 10.0 WORKING AREA AND ACCESS

Access to and from the working area shall be from the Stubbe's Property Development property (Roll No. 20-634-00).

The working area shall be an average width of 15 metres along the alignment of the proposed drain for construction purposes, and an average width of 10 metres for maintenance purposes.

## 11.0 SCHEDULES

Four schedules are attached and form part of this report.

### 11.1 Schedule A – Schedule of Allowances

Following Sections 29 and 30 of the Drainage Act, allowances are provided to Landowners for Right-of-Way and Damages to Lands and Crops. Schedule A contains a table of the applicable allowances to Landowners.

### 11.2 Schedule B – Schedule of Estimated Construction Costs

An itemized cost estimate of the proposed construction work is included in detail in Schedule B.

### 11.3 Schedule C – Schedule of Assessment for Construction

Schedule C provides details of the distribution of the total estimated costs for the construction of the municipal drain.

### 11.4 Schedule D – Schedule of Assessment for Maintenance & Suggested Future Apportionment

Schedule D provides details of the distribution of future maintenance costs for the municipal drain. Maintenance assessments are expressed as a percentage of the total maintenance.

A suggested apportionment for the development property (Roll No. 20-634-00) has been provided; to take effect once the subdivision is registered.

## 12.0 ALLOWANCES

Per Sections 29 and 30 of the Drainage Act, Allowances payable to Landowners are described below.

### 12.1 Allowances for Right-of-Way (Section 29)

The Right-of-Way allowance compensates the lands for the right to enter onto the land at various times for the purpose of inspecting the drainage system and conducting maintenance activities.



The land value used for the Right-of-Way calculation is adjusted to account for the use of the land after construction.

The values used for calculating allowances for Right-of-Way are as follows:

Land Use	Land Value	Adjustment Factor for Drainage Act Right-of-Way	Adjusted Land Value for Drainage Act Right-of-Way Allowance
Residential	\$120,000/Ha	50%	\$60,000/Ha

**12.2 Allowances for Damages to Lands and Crops (Section 30)**

Allowances for Damages to Lands and Crops under Section 30 of the Drainage Act, are primarily calculated to compensate landowners for crop losses, and land damages due to the construction and operation of the drain, including access to the working area.

Area values used for calculating allowances for Damages are \$12,000/Ha. for Residential areas

Allowances payable to Landowners are shown in Schedule A.

**Total Allowances, under Sections 29 and 30 of the Drainage Act are \$20,680.**

Allowances will be deducted from the total assessments in accordance with Section 62(3) of the Drainage Act.

**13.0 ESTIMATED CONSTRUCTION COSTS**

Headway Engineering has made an estimate of the cost of the proposed construction work. A detailed description of the construction costs can be found in Schedule B of this report.

Part A – Branch ‘A’ of the Mills-South Norwich Drain	\$ 78,100
Part B – Provisional Items	\$ 3,750
<b>Total Estimated Construction Costs</b>	<b>\$ 81,850</b>

**14.0 SUMMARY OF ESTIMATED PROJECT COSTS**

The total estimated project costs are as follows:

Allowances under Sections 29 and 30 of the Drainage Act (Refer to Schedule A)	\$ 20,680
Total Estimated Construction Costs (Refer to Schedule B)	\$ 81,850
Public engagements, design and drafting reviews, preparation of preliminary cost estimates and assessments, preparation of drainage report, consideration of report, suggested apportionment for final severances of development property.	\$ 35,000
Agency Consultations and Approvals, including permit fees	\$ 2,000



Final inspection of construction, preparation of statutory completion documents	\$ 3,500
Contingencies, Interest and net H.S.T.	\$ 5,070
<b>TOTAL ESTIMATED PROJECT COSTS</b>	
<b>BRANCH 'A' OF THE MILLS-SOUTH NORWICH MUNICIPAL DRAIN</b>	<b>\$ 148,100</b>

The estimated cost of the work in Norfolk County is \$148,100.

The above costs are estimates only. The final costs of construction, engineering and administration cannot be determined until the project is completed.

The above cost estimate does not include costs associated with defending the drainage report should appeals be filed with the Court of Revision, Drainage Tribunal and/or Drainage Referee. Should additional costs be incurred, unless otherwise directed, the additional costs would be distributed in a pro-rata fashion over the assessments contained in Schedule C and as may be varied under the Drainage Act.

## 15.0 ASSESSMENT

Headway Engineering assesses the cost of this work against the Lands and Roads as shown in Schedule C - Assessment for Construction.

Assessments were determined using the principles included in the 'Drainage Assessment Revisited' paper prepared by E.P. Dries and H.H. Todgham. These principles of assessment are recognized to be fair and equitable for determining cost distributions among those affected.

### 15.1 Benefit (Section 22)

Benefit assessment is applied to those properties receiving a benefit as defined in Section 1 of the Drainage Act which is extracted below:

*Benefit means the advantages to any lands, roads, buildings or other structures from the construction, improvement, repair, or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or sub-surface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures.*

### 15.2 Outlet Liability (Section 23)

Outlet Liability is distributed to all properties within the liable watershed area on an adjusted area basis. The areas are adjusted to accurately reflect equivalent run-off rates relative to other lands and roads within the watershed. Due to development, roads have been assessed higher Outlet Liability rates relative to agricultural lands.

### 15.3 Special Benefit (Section 24)

#### 15.3.1 Assessment of Costs for Urban Design Standard

The Special Benefit instrument of assessment was used to assess the increased costs of using an urban design standard instead of a typical municipal drain design standard to the property



requiring the increased design standard for their proposed development. This assessment tool is used to separate the increased costs caused by the additional design standard.

## **16.0 MAINTENANCE**

After completion, Norfolk County shall maintain the Branch 'A' of the Mills-South Norwich Municipal Drain. Maintenance shall be at the expense of all the lands and roads assessed in accordance with the attached Schedule D - Assessment for Maintenance, and in the same relative proportions until such time as the assessment is changed under the Drainage Act.



## **Schedule A**

## **Allowances**

**Schedule of Allowances**  
**Branch 'A' of the Mills-South Norwich Municipal Drain**

Branch 'A'	Property Details				Drainage Act Allowances		
	Part Lot	Concession	Landowner	Roll Number	Right of Way (Sec. 29)	Damages (Sec. 30)	Total Allowances
	25	1 STR	Netherlands Reformed Congregation	20-631	\$ 11,160.00	\$ 2,170.00	\$ 13,330.00
	25	1 STR	Michael & Heidi Nunn	20-632	\$ 4,500.00	\$ 2,350.00	\$ 6,850.00
	25	1 STR	Stubbe's Property Development	20-634	\$ -	\$ 500.00	\$ 500.00
	<b>Total Allowances</b>						
	<b>Branch 'A'</b>				<b>\$ 15,660.00</b>	<b>\$ 5,020.00</b>	<b>\$ 20,680.00</b>



## **Schedule B**

### **Estimated Construction Costs**

## Schedule of Estimated Construction Costs

An estimate of the cost of the proposed work has been completed, which is outlined in detail as follows:

### Part A - Branch 'A'

Description	Estimated Quantity	\$/Unit		Total
1) Supply and place quarry stone rip-rap protection using 150mm to 300mm diameter quarry stone on geo-textile filter material, placed 450mm in depth	l.s.		\$	8,075.00
2) Clearing, brushing and mulching	l.s.		\$	5,000.00
3) Supply 375mm diameter HDPE Pipe (CSA B182.8 with gasketed joining systems)	260 m	\$	70.00	\$ 18,200.00
Installation (Sta. 0+021 to Sta. 0+281)	260 m	\$	120.00	\$ 31,200.00
4) Supply and install 1200mm dia. Reinforced concrete manhole	1 ea.	\$	10,000.00	\$ 10,000.00
5) Emergency overflow and restoration	1125 m2	\$	5.00	\$ 5,625.00
<b>Sub-Total - Work on Lands</b>			<b>\$</b>	<b><u>78,100.00</u></b>

### Part B - Provisional Items

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

- 1) Additional costs associated with installation of tile drain on 19mm diameter crushed clear stone bedding. This includes the supply and placement of all stone, and additional labour and equipment required for installation in accordance with the Typical Pipe Installation on wrapped Stone Bedding Detail.

Description	Estimated	\$/Unit	Total
375mm diameter pipe	50 m	\$ 75.00	\$ 3,750.00

**Part B - Provisional Items** **\$ 3,750.00**

### Summary of Estimated Construction Costs

Part A - Branch 'A' \$ 78,100.00  
 Part B - Provisional Items \$ 3,750.00

**Total Estimated Construction Costs** **\$ 81,850.00**

Total Estimated Materials \$ 18,200.00  
 Total Estimated Labour and Equipment \$ 63,650.00

**Total Estimated Construction Costs**  
**Branch 'A' of the Mills-South Norwich Municipal Drain** **\$ 81,850.00**



## **Schedule C**

### **Assessment for Construction**

**Schedule of Assessment for Construction  
Branch 'A' of the Mills-South Norwich Municipal Drain**

	Property Details				Drainage Act Instruments of Assessment				For Information		
	Part Lot	Concession	Landowner	Roll Number	Approx. Ha. Affected	Benefit (Sec. 22)	Outlet Liability (Sec. 23)	Special Benefit (Sec. 24)	Total Assessment	Less Allowances	Net Estimated Expense
<b>Branch 'A'</b>	25	1 STR	Netherlands Reformed Congregation	20-631		\$ -	\$ -		\$ -	\$ 13,330	-\$ 13,330
	25	1 STR	Michael & Heidi Nunn	20-632		\$ -	\$ -		\$ -	\$ 6,850	-\$ 6,850
	25	1 STR	Stubbe's Property Development	20-634	3.37	\$ 15,990	\$ 17,313	\$ 108,120	\$ 141,423	\$ 500	\$ 140,923
	25	1 STR	Clarence Slaght	20-645	0.09	\$ -	\$ 426		\$ 426	\$ -	\$ 426
	25	1 STR	Sandra Tibocho & Gongora Ramirez	20-638	0.24	\$ -	\$ 1,106		\$ 1,106	\$ -	\$ 1,106
	25	1 STR	Wilfred Ferlatte & Susan Frenette	20-637-10	0.13	\$ -	\$ 589		\$ 589	\$ -	\$ 589
	25	1 STR	Patrick Hiscock, Janice & Jessie McGeachy	20-637	0.05	\$ -	\$ 227		\$ 227	\$ -	\$ 227
	25	1 STR	Robert Chatterson	20-636	0.11	\$ -	\$ 499		\$ 499	\$ -	\$ 499
	25	1 STR	Matthew & Theresa Gantner	20-635	0.08	\$ -	\$ 376		\$ 376	\$ -	\$ 376
	25	1 STR	Dave and Susan Smith	20-634-02	0.24	\$ -	\$ 1,088		\$ 1,088	\$ -	\$ 1,088
	25	1 STR	Barry Bakos	20-633	0.19	\$ -	\$ 843		\$ 843	\$ -	\$ 843
	<b>Total Assessments on Lands</b>						\$ 15,990	\$ 22,467	\$ 108,120	\$ 146,577	\$ 20,680
Byerlay Side Road		Norfolk County			0.17	\$ -	\$ 1,523		\$ 1,523		\$ 1,523
<b>Total Assessments on Roads</b>						\$ -	\$ 1,523	\$ -	\$ 1,523		\$ 1,523
<b>Total Assessments</b>											
<b>Branch 'A' of the Mills-South Norwich Municipal Drain</b>						\$ 15,990	\$ 23,990	\$ 108,120	\$ 148,100	\$ 20,680	\$ 127,420

- Notes:
- 1 Benefit and Outlet Liability are assessed based on the estimated costs of a typical municipal drain design standard.
  - 2 The Special Benefit Assessment (Sec. 24) is the estimated costs of constructing a drainage system to an urban design standard.
  - 3 The Net Estimated Expense is the Total Assessment less allowances.
  - 4 The above assessments have been made in accordance with the Drainage Act. Any private arrangements between parties are permissible but remain independent of the assessment schedule and outside the Engineer's Report.



## **Schedule D**

**Assessment for Future Maintenance**

**&**

**Suggested Future Apportionment**

## Schedule of Assessment for Maintenance Branch 'A' of the Mills-South Norwich Municipal Drain

Branch 'A' of the Mills-South Norwich Municipal Drain	Property Details					Portion of Maintenance Assessment
	Part Lot	Concession	Landowner	Roll Number	Approx. Ha. Affected	Branch 'A'
	25	1 STR	Stubbe's Property Development	20-634	3.37	72.17%
	25	1 STR	Clarence Slaght Sandra Tibochoa & Gongora	20-645	0.09	1.78%
	25	1 STR	Ramirez	20-638	0.24	4.61%
	25	1 STR	Wilfred Ferlatte & Susan Frenette	20-637-10	0.13	2.46%
	25	1 STR	Patrick Hiscock, Janice & Jessie McGeachy	20-637	0.05	0.95%
	25	1 STR	Robert Chatterson	20-636	0.11	2.08%
	25	1 STR	Matthew & Theresa Gantner	20-635	0.08	1.57%
	25	1 STR	Dave and Susan Smith	20-634-02	0.24	4.54%
	25	1 STR	Barry Bakos	20-633	0.19	3.51%
	<b>Total Assessments on Lands</b>					<b>93.65%</b>
	Byerlay Side Road		Norfolk County		0.17	6.35%
	<b>Total Assessments on Roads</b>					<b>6.35%</b>
	<b>Total Assessments</b>					
	<b>Branch 'A' of the Mills-South Norwich Municipal Drain</b>					<b>100.00%</b>

## Suggested Apportionment of Roll No. 20-634

<b>Property Details</b>		<b>Apportionment of Maintenance Assessment</b>
Plan Number	Approx. Ha. Affected	
1	0.23	4.71%
2	0.26	5.33%
3	0.23	4.71%
4	0.20	4.10%
5	0.18	3.69%
6	0.16	3.28%
7	0.25	5.12%
8	0.21	4.30%
9	0.16	3.28%
10	0.17	3.48%
11	0.18	3.69%
12	0.26	5.33%
<b>Total Apportionment on Private Lands</b>		<b>51.02%</b>
Amberwing Court		12.34%
Block 13 (SWM Block)		6.97%
Block 14 (Highway Crescent Connection)		1.84%
<b>Total Apportionment on Municipal Lands</b>		<b>21.15%</b>
<b>Total Apportionment</b>		<b>72.17%</b>



## **Specifications for the Construction of Municipal Drainage Works**

DIVISION A – General Conditions  
DIVISION F – Specifications for Storm Drains  
and Appurtenances  
DIVISION H – Special Provisions



**DIVISION A**

**General Conditions**





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## **DIVISION A – GENERAL CONDITIONS**

### **A.1. Scope**

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

### **A.2. Tenders**

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

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

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

### **A.3. Examinations of Site, Drawings, and Specifications**

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

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

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

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



#### **A.4. Payment**

Progress payments equal to 87±% of the value of work completed and materials incorporated in the work will be made to the Contractor monthly. An additional ten per cent (10±%) will be paid 60 days after the final acceptance by the Engineer, and three per cent (3±%) of the Contract price may be reserved by the Municipality as a maintenance holdback for a one (1) year period from the date of the Completion Certificate. A greater percentage of the Contract price may be reserved by the Municipality for the same one (1) year period if in the opinion of the Engineer, particular conditions of the Contract requires such greater holdback.

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

#### **A.5. Contractor's Liability Insurance**

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

The following are to be named as co-insured:

- Successful Contractor
- Sub-Contractor
- Municipality
- Headway Engineering

#### **A.6. Losses Due to Acts of Nature, Etc.**

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

#### **A.7. Commencement and Completion of Work**

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

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

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



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

### **A.8. Working Area and Access**

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

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

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

### **A.9. Sub-Contractors**

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

### **A.10. Permits, Notices, Laws and Rules**

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

### **A.11. Railways, Highways, and Utilities**

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

### **A.12. Errors and Unusual Conditions**

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

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

### **A.13. Alterations and Additions**

The Engineer shall have the power to make alterations in the work shown or described in the Drawings and Specifications and the Contractor shall proceed to make such changes without causing delay. In



every such case, the price agreed to be paid for the work under the Contract shall be increased or decreased as the case may require according to a fair and reasonable evaluation of the work added or deleted. The valuation shall be determined as a result of negotiations between the Contractor and the Engineer, but in all cases the Engineer shall maintain the final responsibility for the decision. Such alterations and variations shall in no way render the Contract void. No claims for a variation or alteration in the increased or decreased price shall be valid unless done in pursuance of an order from the Engineer and notice of such claims made in writing before commencement of such work. In no such case shall the Contractor commence work which he considers to be extra before receiving the Engineer's approval.

#### **A.14. Supervision**

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

#### **A.15. Field Meetings**

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

#### **A.16. Periodic and Final Inspections**

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

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

#### **A.17. Acceptance By the Municipality**

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

#### **A.18. Warranty**

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

#### **A.19. Termination of Contract By The Municipality**

If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days notice in writing from the Engineer to supply additional workmen or materials to commence or complete the works, or if he should fail to make prompt payment to Sub-Contractors, or for material, or labour, or persistently disregards laws, ordinances, or the instruction of the Engineer,



or otherwise be guilty of a substantial violation of the provisions of the Contract, then the Municipality, upon the certificate of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, by giving the Contractor written notice, terminate the employment of the Contractor and take possession of the premises, and of all materials, tools and appliances thereon, and may finish the work by whatever method the Engineer may deem expedient but without delay or expense. In such a case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price will exceed the expense of finishing the work including compensation to the Engineer for his additional services and including the other damages of every name and nature, such excess shall be paid by the Contractor. If such expense will exceed such unpaid balance, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer.

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

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

## **A.20. Tests**

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

## **A.21. Pollution**

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

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

## **A.22. Species and Risk**

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

## **A.23. Road Crossings**

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

### **A.23.1. Road Occupancy Permit**



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

### **A.23.2. Road Closure Request and Construction Notification**

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

### **A.23.3. Traffic Control**

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

### **A.23.4. Weather**

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

### **A.23.5. Equipment**

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

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

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

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

## **A.24. Laneways**

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

Culverts shall be bedded with a minimum of 300mm of granular material. Granular material shall be placed simultaneously on each side of the culvert in lifts not exceeding 150mm in thickness and compacted to 95% Standard Proctor Density. Culverts shall be installed a minimum of 10% of the



culvert diameter below design grade with a minimum of 450mm of cover over the pipe unless otherwise noted on the Drawings.

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

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

### **A.25. Fences**

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

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

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

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

### **A.26. Livestock**

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

### **A.27. Standing Crops**

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

### **A.28. Surplus Gravel**

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

### **A.29. Iron Bars**

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

### **A.30. Rip-Rap**



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

### **A.31. Clearing, Grubbing and Brushing**

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

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

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

### **A.32. Restoration of Lawns**

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

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

**END OF DIVISION**



**DIVISION F**

**Specifications for Storm Drains and  
Appurtenances**





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## DIVISION F – SPECIFICATIONS FOR STORM DRAINS AND APPURTENANCES

### F.1. WORK INCLUDED

The Contractor shall provide all labour, materials and equipment necessary to complete the work of this section, as shown or described by or reasonably inferable from the drawings or specifications, including the following:

- Excavation
- Laying sewers
- Construction of appurtenances
- Installation of stubs where required

Specifications for construction of municipal drainage works shall form part of this specification and shall be observed at all times.

### F.2. EXCAVATION

The Contractor shall do all excavation of whatever substances encountered to line and depth as shown on drawings. Excavated materials not required for fill or backfill shall be removed from site as directed by the Engineer and disposed of by the Contractor. At the bottom, the trench shall be shaped so as to conform, as near as possible, to the outside diameter of the pipe. Particular care is to be taken to recess the bottom of the trench to relieve the bell of the pipe of all load.

Excavation shall not be carried below the required level. Excess excavation below the required level shall be backfilled at the Contractor's expense with earth, sand, gravel or concrete, as directed by the Engineer, and thoroughly tamped.

Unstable soil shall be removed and replaced with gravel, crushed stone or crushed slag, which shall be thoroughly tamped. The Engineer shall determine the depth of removal of unstable soil. The Contractor will be paid extra for removing unstable soil and replacing it with gravel.

Ground adjacent to all excavations shall be graded to prevent surface flows from entering the excavation.

The Contractor shall remove, by pumping or other means approved by the Engineer, any water accumulated in the excavation at his own expense.

#### F.2.1. Trench Excavation

The trench shall be excavated in strict accordance with the Trench Excavation Protection Act.

#### F.2.2. Rock Excavation

Shall include removal of boulders larger than  $\frac{1}{4}$  cubic metre in volume and ledge rock, concrete or masonry structures that required drilling or blasting. Payment for this will be additional to the contract amount.



### **F.2.3. Bracing and Shoring**

The Contractor shall do all bracing, sheathing and shoring necessary to perform and protect all excavations as indicated on the plans, as required for safety, as directed by the Engineer or to conform to governing laws at his own expense.

### **F.2.4. Temporary Bridges**

Temporary bridges or crossings shall be built by the Contractor, where required, to maintain traffic.

## **F.3. BACKFILLING**

After pipes have been tested and approved, backfilling shall be done with approved material free from large clods or stones.

### **F.3.1. Roadway Crossings**

Where the drain crosses roadways or laneways, the Contractor is to supply and place 600 mm of approved granular material in the top of the trench for the full width of the travelled portions. The bottom 300 mm shall be of clean pit run gravel meeting M.T.O. Granular "B" or suitable sand cushion specifications and shall be thoroughly mechanically compacted. The top 300 mm shall be thoroughly mechanically compacted. The top 300 mm shall be clean crushed gravel meeting M.T.O. Granular "A" specifications (maximum size 20 mm) and be thoroughly mechanically compacted in lifts not exceeding 150 mm in depth. All roadway crossings shall be constructed using extra strength concrete pipe.

Where the drain crosses under a pavement surface, the Contractor is to repave the trench to the satisfaction of the Engineer. This shall apply to both roadways and laneways.

### **F.3.2. Trenches**

Approved on-site backfill material shall be placed evenly and carefully around and over the pipe and shall be thoroughly tamped. Care must be taken that connections will not be injured or thrown out of line. The remaining backfill shall consist of approved excavated material and shall be satisfactorily compacted in 300 mm layers by means of backhoe bucket or similar means.

### **F.3.3. Manholes and Other Structures**

All forms, trash and debris shall be removed and cleared away. Approved backfill material may be from excavation or borrow; it shall be free from rock, lumber or debris. Backfill material shall be placed symmetrically on all sides in 200 mm maximum layers. Each layer shall be moistened and compacted with mechanical or hand tampers.

### **F.3.4. Maintenance**

The Contractor shall refill any settlement occurring in all backfilled areas.

## **F.4. PIPE**

Bell and spigot concrete sewer pipe shall be used unless otherwise specified on the drawings.



All concrete pipe, 450 mm in diameter or less, shall conform to A.S.T.M. Specification C14 for standard strength pipe and extra strength pipe.

All concrete pipe, greater than 450 mm in diameter, shall conform to A.S.T.M. Specification C76 for all classes specified.

## **F.5. JOINTS**

All concrete sewer pipe shall be laid with open joints unless tight joints are specified on the drawings.

### **F.5.1. Tight Joints**

The sewer shall have rubber gasket joints. These gaskets shall be “Tylox or Rexon K” as manufactured by the Hamilton-Kent Manufacturing Co., Kent, Ohio or Best Seal Rubber Joint as manufactured by the Best Pipe Co. or approved equal. The gaskets shall be cemented according to the manufacturer’s instructions.

### **F.5.2. Open Joints**

The sewer pipe shall be laid without rubber gaskets, grout, caulk or other materials commonly used for tight pipe joints.

## **F.6. LAYING PIPE**

All sewers shall be laid true to line and grade with bells up grade. The sections of the pipe shall be so laid and fitted together that when complete, the sewer will have a smooth and uniform invert. The pipe shall be kept thoroughly clean. Each pipe shall be inspected for defects before lowered into the trench.

Before the pipe is laid, the Contractor shall establish and maintain all lines and grades for construction. Substantial batter boards, lines and secondary benchmarks shall be constructed and maintained.

The Engineer may check all grades and levels; however, this in no way relieves the Contractor of his responsibility of constructing the drain to the correct elevation.

### **F.6.1. Water in Trenches**

Water shall not be allowed in the trenches while the pipes are being laid.

### **F.6.2. Limit of Trench Opened**

Not more than 30 metres of trench shall be opened in advance of pipe laying unless permitted by the Engineer.

### **F.6.3. Exposed Ends Protected**

The excavation of trenches shall be fully completed a sufficient distance in advance of the laying of the sewer and the exposed end of all pipes shall be fully protected with a board or other approved stopper to prevent earth or other substances from entering the pipe.

### **F.6.4. Pipes Kept Clean**

The interior of the sewer shall be carefully free from all dirt, cement or superfluous material of every description as the work progresses. Pipes shall be thoroughly flushed at the completion of the work of laying and jointing.



## **F.7. CONNECTIONS**

All connections, which are for future use, shall be properly capped. No pipe shall be cut for connections except when permitted by the Engineer.

## **F.8. INSPECTION OF JOINTS**

Joints shall not be covered until approved by the Engineer.

## **F.9. APPROVAL OF MATERIALS**

Manufacturer's Certificate

Materials may be used if accompanied by the manufacturer's certificate of compliance, pending any test which may be made by the Engineer in accordance with A.27 in Division A "General Conditions".

## **F.10. MANHOLES AND CATCH BASINS**

Concrete manholes shall be constructed to the dimensions shown on the drawings and in the locations designated on the plans and profiles or as directed by the Engineer. The Ministry of Transportation of Ontario Specifications for concrete shall apply to all concrete for manholes, catch basins and appurtenances. The concrete shall attain a minimum compressive strength at 28 days of 20 MPa. The M.T.O. Specifications for reinforcing steel shall apply to all reinforcing used in the construction.

### **F.10.1. Benching or Channels**

Channels shall be smooth and true to line and grade and may be Constructed of concrete formed to the dimensions shown on the drawings or of sewer pipe neatly cut off as shown. A shoulder or bench of concrete shall be formed from the channel to the manhole walls as shown. Where the pipe size increases at a manhole, the channel shall be so formed as to form a straight line and grade between the inside of the inlet and outlet pipes. Where indicated or directed, a drop structure shall be constructed by the Contractor in accordance with the details shown on the drawings.

### **F.10.2. Frames and Covers**

All manholes and catch basins shall be supplied with cast iron frames and covers, DD-704 and DD-706 M.T.O. Standards. See copy of the standard in this specification.

Ditch inlet catch basins shall be supplied with M.T.O. type DD-710 frames and covers or approved equals.

All brick used in the construction of manholes shall conform to the current A.S.T.M. C-32 Grade S.A. Specifications. "Hard Common Everhard Sewer Brick" manufactured by Cooksville-LaPrairie Brick Limited, is an example of a brick conforming to these specifications. A minimum of 150 mm of brick work shall be required at each manhole and catch basin.

### **F.10.3. Location**

Locations of all manholes and catch basins shall be verified in the field by the Engineer or Commissioner.

### **F.10.4. Steps**



Manhole steps shall be supplied and installed by the Contractor. All steps shall be approved by the Engineer prior to use and may be steel galvanized safety type steps or cast iron steps, weighing at least 3.5 kg each, provided that approval for their use is obtained.

#### **F.10.5. Catch basins**

Standard 600 mm x 600 mm and 1200 mm catch basins shall be M.T.O. Type DD-702 and DD-701-A respectively. Standard 600 mm x 600 mm and 600 mm x 1200 mm ditch inlet catch basins shall be M.T.O. type DD-716-A and DD-716-B respectively. Standard 600 mm x 600 mm precast catch basin shall be M.T.O. type DD-711.

#### **F.10.6. Manholes**

Shall be M.T.O. Standard DD-701-A or approved precast concrete manhole.

#### **F.10.7. Catch basin Leads**

Shall be 200 mm diameter concrete pipe C14-65 extra strength and shall have a one (1) percent minimum grade.

#### **F.10.8. Backfill**

All catch basins and manholes shall have porous backfill placed to a minimum thickness of 300 mm on all sides as per above M.T.O. Standards. The backfill shall be satisfactorily compacted.

### **F.11. PRIVATE SERVICE CONNECTIONS**

#### **F.11.1. Materials**

Asbestos cement pipe, 100 mm diameter shall be used. The pipe and couplings shall be manufactured in accordance with current A.S.T.M. Specification C-428. Couplings shall be of the sleeve type with rubber rings (A.S.T.M. Spec. D-1869).

Connections to concrete pipe shall be by means of a shop fabricated tee in the sewer line. Ends of private drain connections (P.D.C.) shall be plugged with expanding plastic flange plugs as supplied by Johns-Manville or equal.

#### **F.11.2. Construction**

The instruction for the installation of sewers shall generally apply to the installation of P.D.C.'s. P.D.C.'s shall terminate at the lot line and shall be plugged as specified. Joints shall be made in accordance with the manufacturer's instruction.

#### **F.11.3. Location of P.D.C.**

The locations of P.D.C.'s shall be determined from the property owner at the time of construction by the Contractor.

#### **F.11.4. Marker Stakes**

A 50 mm x 50 mm wooden stake shall be placed above the end of each P.D.C. The top of the marker stake shall be 300 mm below finished grade.



It is essential that complete records be kept of the exact location of all house connections. The Contractor is to co-operate in every way possible with the Engineer to secure this information.

### **F.12. MAINTENANCE OF TRAFFIC**

The Contractor shall maintain a minimum one lane of traffic during construction. Restoration of the roadway shall be completed as soon as practical after installation of the sewer.

### **F.13. EXISTING SERVICES**

The Contractor shall take all necessary precautions to protect buildings or other structures, pavements, sidewalks, existing sewers, drains, watermains, and private water connections, gas mains and private gas connections, poles, wires, lawns, trees, ornamental bushes, gardens, etc. and shall be responsible for any damages to same. In case of injury, it shall be made good by the Contractor immediately without additional compensation unless directed otherwise by the Engineer.

All underground services shall be field located by the Contractor before construction begins.

In case any sewer, drain or watermain should be encountered whose present grade should require changing on account of the new sewer, the work necessary for this shall be performed by the Contractor according to the directions of the Engineer and shall be paid for as extra work. Should the Contractor fail to connect up any house or field drain without advance approval of the Engineer such work shall be made good at the Contractor's expense.

### **F.14. RESTORATION**

Roads, lawns, driveways, and other surfaces shall be restored to the original conditions, with the exception that the lawns may either be covered with 50 mm topsoil and sod, or 100 mm topsoil and be seeded with a high quality grass seed. The Contractor's tender price shall include the cost of this work.

### **F.15. ROADSIDE DITCHES**

All roadside ditches shall be properly graded to the new catch basins. All laneway culverts shall also be adjusted, where necessary, to the grade of the roadside ditch.

**END OF DIVISION**



## **SPECIAL PROVISIONS**

**Branch 'A' of the Mills-South  
Norwich Municipal Drain**





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Special Provisions means special directions containing requirements particular to the work not adequately provided for by the standard or supplemental specifications. Special provisions shall take precedence and govern over any standard or supplemental specification.

## **1.0 GENERAL**

The Contractor shall notify the Landowners and the Engineer 48 hours prior to construction.

The Contractor shall arrange a pre-construction meeting and shall invite the Landowners on whose property work will take place, and the Engineer.

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

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

The Contractor must maintain access to all driveways along the route of the drain as well as always maintain access for all emergency vehicles during the construction.

The Contractor shall be responsible for settlement within the warranty period.

## **2.0 UTILITIES**

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

The locations and elevations of all utilities shown on the drawings are approximate locations. Actual locations and elevations of all utilities must be verified by the Contractor prior to construction.

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

## **3.0 WORKING AREA AND ACCESS**

Access to and from the working area shall be from the Stubbe's Property Development property (Roll No. 20-634-00).

The average working width for construction purposes shall be 15 metres along the alignment of the proposed drain.

## **4.0 CLEARING BRUSHING AND MULCHING**

The Contractor shall clear, brush and mulch trees from within the working area that interfere with the construction of the drainage system. The Contractor shall not clear all trees within the working area unless the full working width in a specific section is required for the installation of the drain and unless the Engineer has authorized the full clearing of the trees.

All trees, limbs, and brush less than 150mm in diameter shall be mulched/chipped. Clearing and brushing shall be done prior to the construction of the drain. Trees and branches greater than 150mm in diameter shall be cut into lengths no greater than four metres and placed in nearby stacks designated by the Landowner. Trees removed from road right-of-ways shall be mulched or disposed of offsite by the Contractor.



## 5.0 OUTLET STRUCTURE

The Contractor shall place quarry stone rip-rap protection 300mm to 450mm in diameter and placed 450mm deep in accordance with the detail included in the drawing set.

The plunge pool shall be constructed in accordance with the Plunge Pool Detail included in the drawing set.

## 6.0 PIPE AND INSTALLATION

### 6.1 High Density Polyethylene Pipe (HDPE)

All HDPE pipe shall be CSA B182.8 with gasketed watertight jointing systems.

All HDPE pipe shall be installed using 19mm crushed stone bedding (or approved equivalent) from a minimum of 150mm below the pipe to 150mm above the pipe. Suitable native material shall be used as backfill from 150mm above the pipe to the underside of the topsoil.

The Contractor shall construct clay plugs at intervals no greater than 50m.

The Contractor shall be responsible for all trench settlement within the warranty period.

### 6.2 Poor Soil Conditions

The provisional amount for installation on wrapped crushed stone bedding shall include the supply and installation of all additional labour, equipment and materials required for the installation of the pipe by this method.

If poor soil conditions are encountered, the Contractor shall install the pipe in accordance with the detail for wrapped crushed stone bedding and shall be entitled to the provisional tender amount, in addition to the tendered standard installation price. The Contractor shall be paid for the actual lengths installed in this condition.

## 7.0 TOPSOIL, FINE GRADING AND SEEDING

The Contractor shall strip the topsoil along the alignment of the tile drain to a width of four metres or equal to the width of the trench. The Contractor shall stockpile the topsoil and later spread it over the backfilled trench.

The contractor shall import screened topsoil where necessary and place it no less than 100mm in thickness.

The contractor shall supply and spread an approved lawn seed mixture over all disturbed lawn areas along the route of the drain using the manufacturer's application recommendations.

## 8.0 STRUCTURES

All holes for manhole pipe connections to be cored by the manufacturer.

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



The Contractor shall be responsible for all settlement around the manholes. Should the area around the manholes settle after construction, the Contractor shall be responsible for providing the additional fill material.

All manholes to be OPSD compliant with 1200mm diameter taper cones per OPSD 701.03 where applicable.

All manholes to come with hollow aluminum steps per OPSD 405.010.

All manholes to have closed cast iron grate covers per OPSD 401.010-A.

All manholes to be benched.

### **9.0 RIP-RAP**

All stone rip-rap material shall be quarry stone 150mm to 300mm diameter and placed to a depth of 300mm, unless otherwise noted. All rip-rap material shall be placed on geo-textile filter material.

### **10.0 EROSION AND SEDIMENT CONTROL**

The Contractor shall provide adequate erosion and sediment control for the duration of construction including monitoring and maintenance of the control measures put in place. The Contractor shall inspect the erosion and sediment control measures regularly, and specifically before predicted rainfall events, and after rainfall events.

**NOTES:**

1. THIS MAP WAS CREATED USING NORFOLK COUNTY GEOGRAPHIC INFORMATION SYSTEMS' DIGITAL DATA. THIS MAP IS A SECONDARY PRODUCT WHICH HAS NOT BEEN VERIFIED BY NORFOLK COUNTY.
2. THE CONTOURS WERE CREATED USING IMAGERY DERIVED DIGITAL DATA (2015) FROM LAND INFORMATION ONTARIO.

**LEGEND**

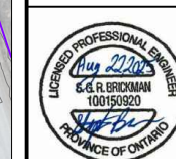
- LOT/CONCESSION LINE
- PROPERTY LINE
- FUTURE PROPERTY LINE
- URBAN BOUNDARY
- MAJOR WATERSHED BOUNDARY
- MINOR WATERSHED BOUNDARY
- BENCHMARK LOCATION
- BENCHMARK No.
- BENCHMARK ELEVATION
- LANDOWNER NAME(S)
- ASSESSMENT ROLL No. (ABBREVIATED)
- AREA WITHIN WATERSHED

**EXISTING FEATURES:**

- DRAIN NAME** OPEN DRAIN WITH CROSSING AND FLOW DIRECTION
- DRAIN NAME** CLOSED DRAIN WITH CATCH BASIN, MANHOLE AND FLOW DIRECTION
- OVERLAND FLOW PATH

**PROPOSED FEATURES:**

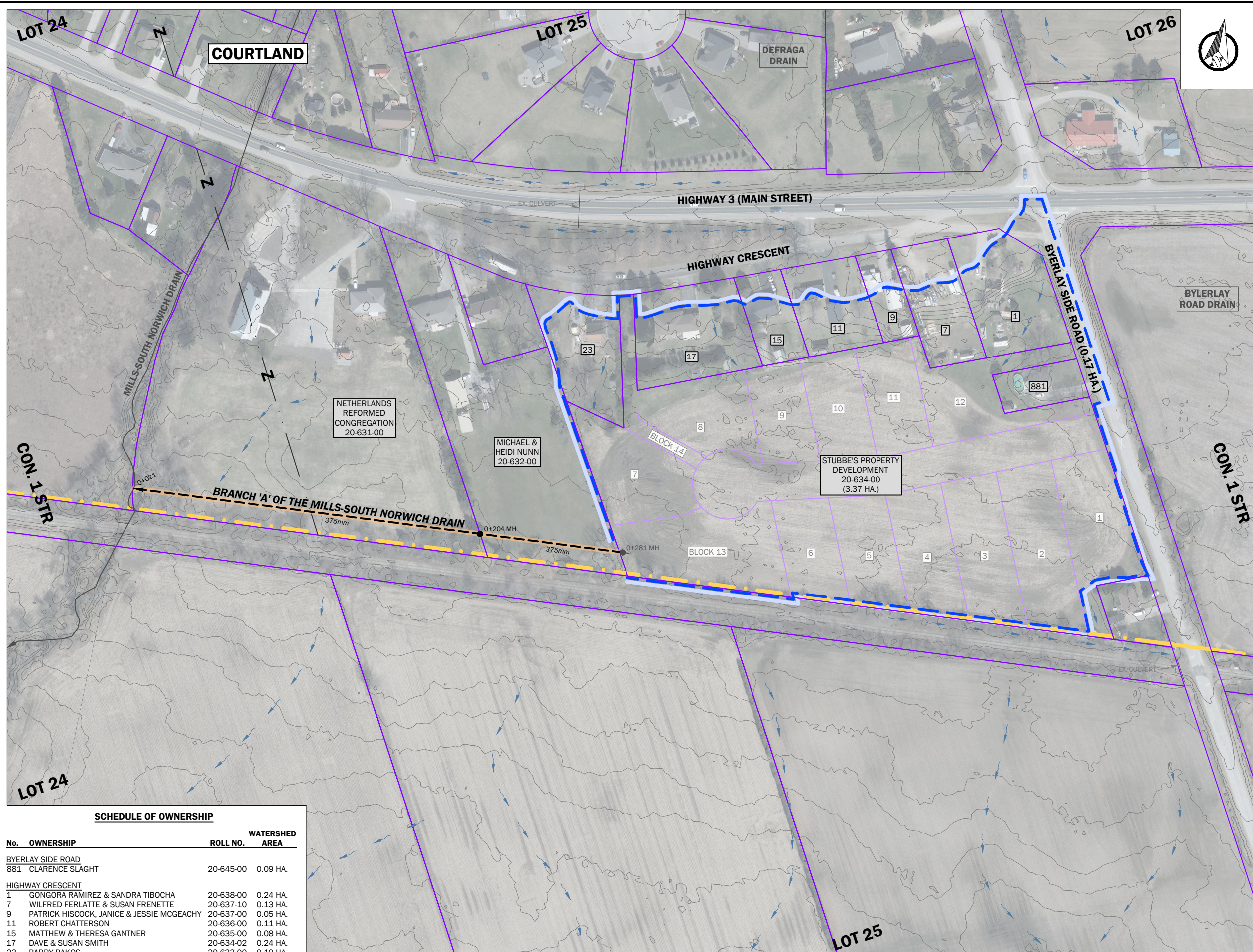
- DRAIN NAME** OPEN DRAIN WITH CROSSING AND FLOW DIRECTION
- DRAIN NAME** CLOSED DRAIN WITH CATCH BASIN, MANHOLE AND FLOW DIRECTION



4	REPORT SUBMISSION	25-08-22
3	PUBLIC INFORMATION MEETING	23-12-06
2	ONSITE MEETING	23-08-30
1	SCOPING MEETING	23-08-14
No.	REVISION	DATE (YY-MM-DD)



DRAWN BY: R.U.	DESIGNED BY:	CHECKED BY: S.B.
DATE: 2025-08-22	REFERENCE No. NRFLK-005	DRAWING No. 1 OF 1



**SCHEDULE OF OWNERSHIP**

No.	OWNERSHIP	ROLL NO.	WATERSHED AREA
<b>BYERLAY SIDE ROAD</b>			
881	CLARENCE SLAGHT	20-645-00	0.09 HA.
<b>HIGHWAY CRESCENT</b>			
1	GONGORA RAMIREZ & SANDRA TIBOCHA	20-638-00	0.24 HA.
7	WILFRED FERLATTE & SUSAN FRENETTE	20-637-10	0.13 HA.
9	PATRICK HISCOCK, JANICE & JESSIE MCGEACHY	20-637-00	0.05 HA.
11	ROBERT CHATTERSON	20-636-00	0.11 HA.
15	MATTHEW & THERESA GANTNER	20-635-00	0.08 HA.
17	DAVE & SUSAN SMITH	20-634-02	0.24 HA.
23	BARRY BAKOS	20-633-00	0.19 HA.

**PLAN SCALE**

